RiverOak Strategic Partners

Summary of Applicant's Case put Orally - Traffic and Transport hearing and associated appendices

TR020002/D8/ISH7

Examination Document

Project Name:	Manston Airport Development Consent Order
Application Ref:	TR020002
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MANSTON AIRPORT DEVELOPMENT CONSENT ORDER APPLICATION

APPLICANT'S WRITTEN SUMMARY OF ORAL SUBMISSIONS PUT AT ISSUE SPECIFIC HEARING 7 ON TRAFFIC AND TRANSPORT

6 JUNE 2019

Laurence Suite, Building 500, Discovery Park, Sandwich, CT13 9FF

1 Introduction

1.1 This document summarises the case put by RiverOak Strategic Partners (the Applicant), at Issue Specific Hearing 7. The hearing opened at 10.00am on 6 June 2019 at Laurence Suite, Building 500, Discovery Park, Sandwich, CT13 9FF. The agenda for the hearing was set out in the Examining Authority's (ExA) letter published on the Planning Inspectorate's website on 24 May 2019 [EV-022].

1.2 The Applicant confirms that all information provided by it to the ExA will be copied to Kent County Council (KCC) and Highways England (in response to the ExA's action point 29). The Applicant notes that all submissions to date have been provided to KCC and Highways England.

2 Agenda Item 4: Transport Assessment

a) Peak hour flows

2.1 There were no comments on this agenda item.

2.2 (The Applicant's response to SWRQ Tr.2.10 stated that there would be no change to the impact of the development in the event of a 2-year delay to the start of construction which was accepted by Kent County Council (KCC) in its response to Tr.3.12).

b) The study area and additional junction assessments

2.3 The Applicant acknowledged that KCC has commented about the scale of development traffic routeing on the A256 and the A299 outside of the Thanet Strategic Transport Model (TSTM) area and the study area previously agreed with KCC.

2.4 The Applicant explained that it has undertaken a proportional impact assessment of development traffic at the A256 junctions which demonstrated that the increase at all junctions is less than the accepted daily variation in traffic flows of 5% and it is an appropriate approach not to include these junctions or to extend the study area.

2.5 KCC has accepted this approach for other planning application Transport Assessments (TA) (e.g. Land off Haine Road – planning reference OL/TH/18/0261). A Technical Note has been produced as Appendix ISH7-32 which sets out the methodology and results (in response to the ExA's action point 32). This also includes commentary on the proportional impact of traffic on the junctions for which mitigation is proposed and illustrates that a robust approach has been undertaken.

2.6 The Applicant noted that development traffic routeing beyond Junction 7 (A299/A28) towards the west and London is on the A299 which has no at-grade junctions and therefore the impact of the development would be minimal. The TA study area therefore has included the extent of the network along the A299. An assessment has been undertaken of M2 J7, Brenley Corner, by both the Applicant and Highways England and both found that the development traffic does not have a material impact on the merge/diverge lanes at the junction.

2.7 The Applicant highlighted that a standard spreadsheet traffic modelling methodology used in the original TA is a conventional approach applied in numerous planning applications and appeals without controversy and has been accepted by KCC for a number of recent planning applications, including Land off Haine Road OPA (planning reference OL/TH/18/0261). The spreadsheet model was implemented as the TSTM was not available at the time of the development of the TA. However, the Applicant confirmed that it did include allowance for the draft Local Plan residential and employment growth via an adjustment to the Tempro growth rates. The Applicant noted that the Revised TA was produced in response to a request from KCC, and once the updated TSTM based on the current draft Local Plan was available (late 2019), to consider the impacts of the Proposed Development on the future road network that KCC hopes to deliver by 2031.

c) Passenger departure flights

2.8 The Applicant confirmed that traffic generation calculations were based on flight arrival and departure assumptions derived from analysis of comparable airport flight patterns. Departure flights between 09:00 and 13:00 are less frequent compared to other times of the day and were not included in the traffic generation calculations.

2.9 An introduction to the Technical Notes provided in this summary is provided as Appendix 2 to this document. A Technical Note submitted as Appendix ISH7-30 has been produced which explains the assumptions behind the calculations in response to the ExA's action point 30, including passenger arrival times before a flight departure, passenger departure times after a flight arrival, modal share and vehicle occupancy. This sets out the implications of a passenger departure flight which would impact on the morning peak hour as a result of passenger arrivals at Manston Airport (in response to the ExA's action point 31). As a point of clarification, through review of the traffic generation calculations, two issues were identified - double counting of in/out trips were identified, and allocation of arriving trips in the wrong hour. The Technical Note sets out amended traffic flows. This shows an overall reduction in flows over the day, a reduction in AM peak hour traffic generation of 141 vehicles compared to the revised traffic generation in the RTA and a marginal increase in the PM peak hour traffic generation of 11 vehicles compared to the revised traffic generation in the RTA.

2.10 The Applicant accepted that a flight departure between 10:00 and 12:00 would result in passenger traffic arrivals that would affect the morning peak hour.

2.11 A flight arrival between 07:00 and 08:00 would result in passenger traffic departures that would affect the morning peak hour.

2.12 The Applicant provided an example of likely flight patterns: assuming a flight departure at 6:00 to Dublin, a returning flight could then arrive from Dublin by 11:00. Allowing 30 minutes for unloading, cleaning and loading, there could then be a departure flight by 11:30. This pattern would be typical of the likely pattern that would be adopted by low cost operators.

2.13 Following discussions of this item at the hearing, the Applicant confirms that there will be a ban on flights arriving or departing between 09.00 and 11.30, with one departure permitted from 11.30 and one from 12.45. For the 11:30 departure, it is assumed that half of the 30% passenger arrivals would fall within the morning peak hour and for the departure at 11.45, one quarter of passengers would fall within the peak hour.

2.14 As noted in paragraph 2.9 above, the overestimation of the AM peak hour traffic is comparable to the traffic generation for departure and arrival flights which would affect the AM peak hour. On this basis, the DCO TA has been robust and has assessed a situation equivalent to departure/arrival flights affecting the AM peak hour.

d) HGV movements, distribution and potential cap

2.15 The Applicant suggested that Heavy Goods Vehicle (HGV) operators would aim to avoid the peak hour periods due to journey time uncertainty and increased costs and this was accepted by KCC. The propensity for HGV clustering is dealt with in Appendix 2 in response to the ExA's action point 33.

2.16 The Applicant's assessment assumes 236 two-way HGV movements per day/10 per hour based on:

- 340,758 freight tonnes per annum;
- Tail to tail ratio of 10% (never leaves airport);
- 10 tonne HGV load;
- 30% efficiency – HGVs leaving and departing with a load; and
- Operations are 365 days per annum, 24-hours per day, with HGV movements spread evenly over the 24-hour period.

2.17 The Applicant explained that the introduction of a cap on freight tonnage would be difficult to apply and would not necessarily equate to the number of anticipated HGV movements. The first principles approach employed within the assessment took a conservative estimate of HGV payloads, based on an assumption of 10 tonnes per HGV. In reality, this is likely to be higher, which would result in fewer HGV movements. For example, a 44-tonne articulated lorry can carry a maximum payload of 28 tonnes.

2.18 Based on the first principles assumptions in the TA, an increase in the assumption of freight tonnage over the course of a year is unlikely to have a material impact on daily HGV movements. For example, a 10% increase in freight tonnage would result in an additional 24 daily HGV movements per day, which would be spread out over a 24-hour period.

2.19 The Applicant agreed to provide a Framework Freight Management Strategy, submitted as Appendix B to the Travel Plan provided as TR020002/D8/TP (in response to the ExA's action point 34), for incorporation within the Travel Plan and Airport Surface Access Strategy. This includes setting a limit on the number of HGVs exiting the Airport in the peak hour periods to 10 HGVs as set out in both the DCO TA and the RTA. Section 3 of the Travel Plan responds to Highways England's suggestions in response to the ExA's action point 35.

2.20 Both the Applicant and ExA recognised that it would be impractical to apply a restriction on HGV arrival, as it would be impossible for the airport operator to control vehicles coming from distance. The applicant and KCC agreed that such a measure could result in vehicles being parked on the road network as a result of being turned away from the airport site.

d) Shift patterns

2.21 The Applicant confirmed that the TA assumed a three-shift pattern, comprising two daytime shifts and a night-time shift. It was accepted that night-time operations for staff to prepare and process cargo would occur. The Applicant believes that the assumption on shift patterns is still valid.

3 Agenda Item 5: Manston-Haine Link

Deliverability of the Manston-Haine Link Road

3.1 The Applicant confirmed that Manston-Haine link road does not form part of the DCO application, nor does the project rely on its delivery. It is therefore not necessary for it to be secured or assessed as part of the DCO application. KCC agreed that the deliverability of the link road is a matter for them and that a planning application for the road would need to be submitted including any necessary environmental impact assessment and public consultation.

3.2 The Applicant noted that whilst it is supportive of the Inner Circuit Relief Strategy, the Manston-Haine Link which forms part of the wider transport strategy is aspirational and not yet in any adopted Plan. The Applicant further noted that the draft Thanet Transport Strategy in support of the emerging Thanet Local Plan indicates that the route is indicative and will depend on the final proposals for the Northern Grass site.

3.3 KCC has identified a funding model within the transport evidence base in support of the Thanet Local Plan, which is set out in Technical Note - Strategic Site Allocations Impact Thanet Local Plan Evidence Base, July 2018, Amey (enclosed at Appendix 1 to this document). The broad principle of the technical note is that strategic housing developments in Thanet should contribute to the transport strategy at a level commensurate with the impact that they are likely to have on the network.

3.4 The funding model does not identify the airport site as a strategic development, nor does it indicate that it would be included should a development come forward on the site. The model does not include any employment sites.

3.5 There are five strategic residential sites allocated in the draft Thanet Local Plan and a number of road schemes in the TTS which comprise the Inner Circuit. The various parts of the Inner Circuit are required for mitigation of those housing schemes and the study has identified apportionment of developer contributions from the five strategic sites based on traffic generation impact.

3.6 KCC does not currently own any of the land in the Northern Grass that would be required to deliver the link road and nor is that land safeguarded for road development in any adopted or even emerging development plan.

3.7 The Applicant acknowledges KCC's desire to deliver the TTS and has agreed to safeguard (for the duration of the Local Plan period) and transfer to KCC at nil cost, land alongside Manston Road to ensure that the alternative alignment can be delivered in the event that funding is secured for it. Alongside a number of other transport contributions, this is a generous contribution to the costs and deliverability of KCC's proposed link road. A full list of the transport contributions being provided by the applicant is contained within the Revised draft Section 106 agreement submitted as TR020002/D8/S106.

3.8 Safeguarding of the alternative alignment corridor will be secured by the s.106 obligation (an updated draft of which is provided as TR020002/D8/S106. The Applicant believes that the inclusion of safeguarding of the land within the Section 106 agreement is the most appropriate mechanism given that it is unknown as to when KCC plan to deliver the link road and that there is no guarantee that the link road will be delivered.

3.9 In addition to safeguarding the land, the Applicant will be upgrading Manston Road and the junction with Spitfire Way and making a flexible contribution for offsite junction improvements such that this can also be used, all or in part to assist with KCC's wider transport strategy aspirations.

Alternative alignment of the Manston-Haine Link Road

3.10 The Applicant explained that the Masterplan layout for the Northern Grass is indicative and the link road could be accommodated within it without any changes to the zoning or total building footprint shown on the existing Masterplan. KCC acknowledged that the route contained within the TTS has not been the subject of detailed testing, nor has it been the subject of environmental assessment, feasibility study or EIA screening.

3.11 The Applicant reminded KCC that the airport is a Nationally Significant Infrastructure Project that should not be unnecessarily compromised by a transport strategy that is not secured and could be delivered via the alternative alignment proposed by the Applicant.

3.12 The Applicant also confirmed that it had already funded an initial feasibility design of the alternative Manston Haine link demonstrating that equivalent performance could be delivered without the need to take a central line through the Northern Grass. This information is in the public domain and has been shared with KCC. In addition, the Applicant has funded the Revised TA which demonstrated that the Manston-Haine Link in its alternative alignment is deliverable and provides the same performance as the route through the Northern Grass.

3.13 The Applicant has justified inclusion of all plots of land in Appendix 1 to the Statement of Reasons [APP-012]. That justification has not changed. The Applicant recognises KCC's aspirations for a link road and is willing to accommodate delivery of a link road on the NGA without impacting the footprint of development proposed on the NG. If the link road is not delivered by 2031 (or earlier notification from KCC), the Applicant reserves the right to develop the land.

3.14 The Applicant responds to ExA action point 36 at Appendix ISH7-36: routeing the Manston-Haine Link through the Northern Grass Area is not acceptable for reasons of operational efficiency, security and road safety.

3.15 The Applicant highlighted that the alternative alignment as proposed by the Applicant is 100m shorter than the route identified by KCC. It also follows existing highway for part of its length therefore requiring considerably less land take than the KCC option.

3.16 The Applicant re-iterated its intention to safeguard and gift to KCC the land associated with the alternative alignment corridor for the Manston-Haine Link Road. Following discussion at the ISH, the Applicant has agreed to include a buffer zone as to allow for flexibility and adjustments to the alignment's design. This is primarily as a result of unknown potential constraints, such as archaeological finds, and to provide adequate landscaping along either side of the route. The Applicant has provided a plan illustrating the additional land for safeguarding in the draft Section 106 agreement submitted as TR020002/D8/S106.

3.17 In response to the ExA Action 37 (a) the s.106 agreement is the mechanism which will secure the Applicant's commitments to making financial contributions, whereas the DCO secures non-financial commitments that often correspond to the contributions included in the s106 agreement. For example the submission of an Education, Employment & Skills Plan is secured by Requirement 20 of the DCO, and the funding for this is provided in the s106 agreement. Similarly, the provision of bus services is included in the REAC which is secured by Requirement 7 of the DCO, and the funding is again secured by the s106 agreement. The Applicant explained at ISH7 Traffic and Transport that the off-site junctions mitigation is not required to be secured by the DCO because the works benefit from permitted development rights and KCC have expressly requested flexibility to react to changes in the road network, but the commitment to funding them and when is secured through the s106 agreement.

3.18 A section 106 agreement forms a contractual relationship and therefore the local authority would have direct action against the Applicant for any breach of an obligation. There is therefore no need to secure the s106 agreement in the DCO, just as no other side agreement is secured in this or any other DCO.

3.19 In response to the ExA's action point 39, the Applicant has amended the section 106 agreement to ensure that the identified offsite junctions are the primary purpose of the committed funding, and only if the works are not necessary can KCC use the funds for other improvements, provided that they are still for the mitigation of the effects of the project. KCC have asked to comment on the revised s106 agreement that has all figures completed rather than the previous version.

Potential impacts on the Radar Safeguarding Area, Northern Grass Area and Masterplan

3.20 The Applicant confirmed that the radar safeguarding area will not be affected since the radar disc is approximately 27m height and points upwards. Therefore, the road, its street furniture, and traffic would be below the disc and would not prejudice the radar's performance. The Applicant has produced a note, submitted as Appendix ISH7-38 to clarify this point (addressing the ExA's action point 38). It was noted that Manston Road already runs through the radar safeguarding area.

4 Agenda Item 6. Off-Site Junction Assessment and Mitigation

a) Whether the junction improvements should be regarded as associated development, whether they should be secured in the dDCO, whether S278 Agreements are an appropriate way of delivering the improvements and whether any impacts should be fully assessed in the ES.

4.1 The Applicant explained that highway improvements that are part of the mitigation package could be associated development, however, this does not mean that they have to be 'associated development' secured via the DCO. The only appropriate circumstances warranting their inclusion in the DCO might be if they did not otherwise have consent. Since such improvements are within or adjacent to the highway boundary, they benefit from permitted development rights and hence have planning permission. As noted in the Applicant's answer to Tr.3.8, under Class A of Part 9 of the *Town and Country Planning (General Permitted Development) Order*, the highway authority can undertake the works under permitted development rights. The proposed highway improvements do not fall within any of the thresholds for 'EIA development' within Schedule 1 or Schedule 2 to the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017and article 3(10) of the Town and Country Planning (General Permitted Development) Order 2015 does not apply to remove permitted development rights.

4.2 Typically, highways authorities prefer to undertake off-site mitigation through a Section 278 agreement. In this case, the Applicant recognises that KCC requires flexibility through a contribution, as to enable transport improvements to be undertaken that addresses wider impacts, as well as that of the Proposed Development.

4.3 The draft Section 106 agreement submitted as TR020002/D8/S106 includes a contribution towards the off-site mitigation identified in the TA. KCC has welcomed the flexibility offered by inclusion of the contribution towards the off-site mitigation in the Section 106 agreement.

4.4 The Applicant acknowledged that the Designers Responses to the Road Safety Audits (RSAs) had resulted in changes to the mitigation schemes for Junctions 2, 4 and 6. As such, the Applicant has submitted a Technical Note as Appendix ISH7-44, which provides s the junction capacity models for those schemes (responding to the ExA's action point 44).

4.5 In relation to the modelling undertaken using the TSTM, the Applicant confirmed that a scenario without the Manston-Haine Link Road was not commissioned. The original TA presented this case and is considered to be robust since it is based on an accepted approach.

4.6 The Applicant re-iterated that the Revised TA was undertaken to demonstrate that the Proposed Development would not prejudice the delivery of the Manston-Haine Link Road. It was noted that there were fewer mitigation schemes as a result of the TSTM testing and the delivery of the Thanet Transport Strategy, however, there were mitigation schemes common to both assessments. The Applicant reiterated that KCC has identified a funding approach for the Thanet Transport Strategy which is set out within the transport evidence base in support of the Thanet Local Plan, which is set out in *Technical Note - Strategic Site Allocations Impact Thanet Local Plan Evidence Base*, July 2018, Amey. This identifies apportionment of developer contributions from the five strategic residential sites based on traffic generation impact. It does not anticipate or include contributions from the airport operator and so does not rely on the airport operator for the funding of the link roads.

4.7 Thanet District Council (TDC) noted that the draft Local Plan Policy SP47 identifies 14 areas, as shown on the Policies Map, which are safeguarded for the provision of key road schemes and junction improvements, to support the implementation of the Thanet Transport Strategy. Policy 47 also states "*The Council expects all new development to make a proportionate and appropriate contribution to the provision of this key infrastructure*." It was noted that the apportionment study by Amey included only the residential sites and excluded the draft Local Plan strategic employment sites.

4.8 Furthermore, it should be noted that the airport project is itself an infrastructure project that will attract some £300m of investment by the Applicant. This investment will benefit the local economy as well as delivering a Nationally Significant Infrastructure Project and should not therefore be dismissed when considering the overall contributions being made by the applicant towards infrastructure improvements.

4.9 The Applicant confirmed that its contribution to the delivery of the Thanet Transport Strategy is via the improvements to Spitfire Way, Manston Road and the Spitfire Way/Manston Road junction, safeguarding and transferring the land for the Manston-Haine Link Road within the site and providing a contribution for off-site improvements, costed at approximately £5 million.

4.10 It was recognised that the Thanet Transport Strategy will need to be flexible enough to react to changes in the future configuration of the transport network brought about by the anticipated Local Plan reviews and the extent of delivery of the strategic sites. The Section 106 mechanism provides sufficient flexibility to allow the Applicant's contributions to be used to fund appropriate improvements needed at the time, that are proportionate to the impact of the development. Appropriate wording in the Section 106 agreement will be agreed with KCC.

4.11 As requested by the ExA (at action point 41), the Applicant has identified examples of other Nationally Significant Infrastructure Projects that have used a similar approach for off-site mitigation. Highways works were secured by section 278 agreements on the Walney Extension Offshore Wind Farm and the East Midlands Gateway Rail Freight Interchange projects. Tilbury2, Wylfa Newydd Nuclear Power Station, Silvertown Tunnel, Hinkley C Connection, Tidal Lagoon Swansea Bay and Thames Tideway Tunnel all utilised section 106 agreements that covered highways works.

b) The deliverability and feasibility of the junction improvements, including land ownership.

4.12 The Applicant confirmed that, with two exceptions, the junction improvement works identified in the Environmental Statement (ES) [APP-033] are within the highway boundary and benefit from permitted development rights, for which the Applicant has committed to their funding. There can be a high degree of certainty that the works will be delivered by KCC.

4.13 In the event that the Manston-Haine Link Road is not delivered, the proposed signalisation of Manston Court Road/Manston Road would require some third party land comprising 2m to the north of Manston Road, east of Manston Court Road. In the event that the Manston-Haine Link Road is delivered, there is no requirement to provide capacity enhancement at this junction, however, the need to maintain appropriate visibility splays was highlighted within the TA. This is the existing situation at the junction. These works are 'adjacent' to the highway and so benefit from permitted development rights.

4.14 The Applicant confirmed that the Alland Grange Road/Spitfire Way junction had also been identified in the TA as requiring maintenance of appropriate visibility splays. Again, this is an existing situation. These works are also 'adjacent' to the highway and so benefit from permitted development rights.

c) Funding of the off-site junction improvements

4.15 The Applicant proposes to make contributions through a Section 106 agreement to fund the works required to the existing road network to mitigate the impacts of the Proposed Development.

4.16 An updated draft of the section 106 to secure those funds has been submitted by the Applicant as TR020002/D8/S106. This mechanism ensures that the Proposed Development can be delivered with nil detriment to the road network.

4.17 The cost calculations provided by the Applicant are based on construction cost estimations derived from SPONS Civil Engineering and Highway Works Price Book and Project-On costs, including site investigation, design, legal, site supervision, and includes contingency. The cost estimations have been submitted for review by KCC at Appendix ISH7-42 (addressing ExA's action point 42).

4.18 Trigger points for contributions have been identified in the draft Section 106 agreement. A technical note which sets out the methodology for establishing trigger points has been provided at Appendix ISH7-42.

4.19 The Applicant highlighted that an appropriate clause will be inserted into the Section 106 agreement relating to the implementation of mitigation when it is needed. This recognises the need to mitigate the impacts of the proposed development as well as KCC's desire for flexibility to use the contribution for other schemes which may be more appropriate should specific elements of the TTS come forward. This has been included in the updated draft s106 agreement submitted as TR020002/D8/S106.

d) Traffic generation changes

4.20 The Applicant acknowledged that the Revised TA contained changes to passenger arrival times prior to a departure flight assumptions and modal splits. This resulted in no change to the morning peak hour and an additional 87 vehicles in the afternoon peak hour. A Technical Note has been provided as Appendix ISH7-31 which sets out the implications of this on junction capacities (addressing the EX's action point 31). This demonstrates that the mitigation schemes identified are robust and can accommodate the additional traffic.

e) Road Safety Audits

4.21 The off-site mitigation proposals have undergone Road Safety Audits (RSAs), and the revised RSAs based on the Designers Responses have identified no observations, indicating acceptance of the responses. The Applicant has provided outstanding RSAs and Designer Responses as Appendix ISH7-44 (addressing the EX's action point 44).

f) Emergency Site Access

4.22 The Applicant noted that Appendix TR2.47a and TR2.47b comprised plans showing the emergency accesses for the use of Airport Rescue and Fire Fighting Service in the event of an incident outside of the airfield boundary. The plans showed locations on the primary road network.

4.23 The Applicant notes that the making of accesses is part of the detailed design process and as such will need to be approved by TDC under Requirement 4 of the DCO prior to being built out.

4.24 The Applicant has produced a technical note, submitted as Appendix ISH7-45, which sets out the operation of the proposed emergency accesses (addressing the EX's action point 45).

5 Agenda Item 7. Strategic Road Network

5.1 Highways England has undertaken an assessment of the impact of the development traffic at the vulnerable strategic junctions: M2 J7 (Brenley Corner) to the west and Whitfield Roundabout to the south and found that the additional trips would make very little difference.

5.2 The Applicant notes that Highways England has withdrawn its objection on this basis.

6 Agenda Item 8. Off-site Infrastructure Improvements and Airport Surface Access Strategy

Manston Village footway connection

6.1 The Applicant noted that the draft Section 106 agreement at TR020002/D8/S106 includes funding for improvements to Public Right of Way (PRoW) TR10, which the Applicant considers as an acceptable and appropriate means of connecting to Manston Village and the expanding population to the east due to the Manston Green development. This is in line with KCC's PRoW Officer's comments and requests for a contribution and completion of an upgrade to the link. The Applicant notes that during pre-application discussions with KCC's PRoW Officer no concerns were raised in respect of TR10.

6.2 The population of Manston is small (100 houses or less), and the potential usage by residents of a footway alongside the B2050 from the village to the Airport is limited. The improvement of TR10 has the potential to attract higher usage as it will provide a connection to the Manston Green development, comprising 800 homes, as well as Manston Village and the western outskirts of Ramsgate.

6.3 The Applicant has provided a technical note summarising the costs and necessary Section 106 contributions as Appendix 2 (addressing the EX's action point 46).

Public bus services

6.4 The Applicant confirmed that the TA assumes 10% of passenger trips will be by bus or bus and rail and 6% of staff trips will be by bus by Year 20. These are targets that are included in the Framework Travel Plan and will be regularly monitored through surveys and reviewed where necessary.

6.5 The Applicant will provide buses for passengers which will include a shuttle service between Ramsgate Station (or the proposed Thanet Parkway), with services timed to coincide with flight arrivals and departures and train arrivals and departures.

6.6 The Applicant re-iterated that it will provide buses for staff, with routeing and timing to be based on staff home locations and shift patterns.

6.7 The Applicant understands that there are KCC funded bus services which route along Manston Road. It may be appropriate for there to be enhancement of these, such as increased frequency and early/late start and finish times, if they are still operating when Manston Airport becomes operational.

6.8 As bus plans and timetables are not typically planned years in advance, meaningful engagement with KCC and bus operators at this stage is not applicable. The Applicant will hold discussions at an appropriate point in the future to identify the optimum provision. KCC acknowledged the difficulties in engaging with operators in advance of proposals. The

Applicant is willing to add a mechanism to the DCO to ensure that engagement with public transport operators in relation to the provision of services is undertaken prior to the commencement of any operations at the airport, ensuring that an appropriate level of service is in place to achieve the bus modal share targets set out in the Framework Travel Plan for staff and passengers.

6.9 Provision of both a new shuttle service from Ramsgate Station and enhancement of appropriate local bus services are secured in the REAC (which is secured by Requirement 7 of the DCO). The updated draft section 106 agreement submitted as TR020002/D8/S106 contains provision for a contribution by the Applicant to enhancing local bus services.

Thanet Parkway Station

6.10 The Applicant understands that KCC has submitted a planning application for the Thanet Parkway Station. It is anticipated that the project will be constructed by the end of 2021, with services running six-months post implementation. KCC is confident that the project will come forward.

6.11 The applicant is supportive of the proposals for Thanet Parkway Station but does not rely upon it for the implementation of the proposed scheme.

Has enough been done to ensure that sustainable transport has been secured

6.12 The Applicant believes that the combination of improvements to pedestrian provision, the introduction of bus services and connectivity to rail provided by the project offer a range of measures to ensure sustainable transport is maximised.

6.13 The draft Travel Plan sets out targets which will be monitored on a regular basis to ascertain the success of the sustainable transport measures. The approach to monitoring is included in the Framework Travel Plan.

6.14 The Travel Plan is secured via the REAC and its final version will require sign off by KCC in consultation with TDC prior to commencement of operations.

7 Agenda Item 9. Construction Traffic Management Plan, Travel Plan and Car Park Strategy

a) CTMP

7.1 The Applicant confirmed, as set out in the Applicants response to Tr.3.42, that there is no reason to believe that the 'compressed' construction programme as assessed in the ES cannot take place without an increase in construction traffic.

7.2 KCC confirmed that the CTMP includes what is expected of such a document and commented that, with the appropriate management in place, a small increase in construction traffic would not present an issue.

7.3 The Applicant highlighted that the CTMP is a document contained in the REAC and therefore will need to be approved by TDC.

b) Framework Travel Plan

7.4 The Applicant explained that the Framework Travel Plan provides an outline of measures to achieve the modal split targets and will be a live document that will be updated and become more detailed on a continual basis as the construction and operation of the Proposed Development progresses.

7.5 The Applicant noted that the Framework Travel Plan ensures monitoring of its effectiveness with questionnaire surveys of staff and passengers. These will assess how the Travel Plan is being implemented and whether any adjustments are required. The Applicant will add a provision to the Travel Plan to provide that monitoring results are reported back to the Airport Consultative Committee.

7.6 The Applicant explained that the Framework Travel Plan provided a summary of the proposed physical measures including pedestrian provision along Spitfire Way and Manston Road, the enhancement of TR10, and behavioural measures to influence travel choice.

7.7 As requested by the ExA (at action point 49), the Applicant has undertaken a review of the commitments and submitted a Travel Plan as TR020002/D8/TP.

c) Car Park Management Strategy

7.8 The Applicant has provided clarification on the modal split assumptions as Appendix ISH7-43 via submission of a technical note (addressing the ExA's action point 43), and a note about the Car Park Management Strategy as Appendix ISH7-50 (addressing ExA's action point 50).

7.9 The land identified for the overspill provision is part of the construction compound for the Proposed Development and will be available for parking on completion of construction, ensuring that any seasonal variation in parking demand can be accommodated within the site.

7.10 KCC agreed that provision of sufficient car parking spaces was important to prevent any overspill parking into the surrounding residential areas.

7.11 The Applicant acknowledges the need to monitor and review the parking uptake and confirmed that the parking uptake will be assessed as part of the Travel Plan. The Applicant will also make a contribution to KCC's monitoring fees. The draft section 106 agreement provided as TR020002/D8/S106 contains a mechanism for payment of such contribution at schedule six.

7.12 Blue badge parking is included in the Car Park Management Strategy, alongside provisions for electric vehicles. An updated Car Park Management Strategy has been submitted as Appendix ISH7-52 (addressing the ExA's action point 52).

ISH7 Appendix Index

ExA Action No.	Appendix No.	Document
N/A	1	Amey Technical Note Strategic Site Allocations Impact 2018
N/A	2	General summary of Traffic and Transport Appendices
30	ISH7 – 30	Note on where the figure of 58 vehicle movements (30% of 193) in response to Third Written Question TR.3.20 ii) for trip generation in the am peak has been derived.
31	Addressed in ISH7 – 30	Note on sensitivity testing of junctions with additional passenger traffic in am peak (based on a reasonable worst case).
32	ISH7 – 32	Note considering proportional impacts of extended study area to take into account vehicle movements leaving/ entering the study area at A299 Thanet Way at St Nicholas at Wade and the A256.
36	ISH7 – 36	Explanatory Note of the Safety and Security Issues with the Manston Haine Link Road Transecting the Northern Grass Area
38	ISH7 – 38	Note on any implications for safeguarding a wider corridor for the proposed Manston-Haine link road (to allow for KCC mitigation) – particularly but not solely with reference to the radar safeguarding zone.
42	ISH7 – 42	Note showing how the contributions for each junction set out in the draft s106 agreement have been calculated and their timings established.
43	ISH7 – 43	Technical note on the effects that changes made in the revised TA methodology (in terms of modal split (shared taxi) and the timing of passenger arrivals before flights) would have on the modelling and results in the original TA.
44	ISH7 – 44	Stage 1 Road Safety Audits and design responses for junction improvement schemes that were needed in the original TA, but not the revised TA.
45	ISH7 – 45	Note on the intended locations of emergency accesses and how these might be appropriately secured at this stage of the examination.
50	ISH7 – 50	Note about the Car Park Management Strategy, in relation to apparent overprovisions in parking spaces considering number of passenger flights proposed
52	ISH7 - 52	A ‘Blue Badge’ parking strategy in car parking strategy and arrangements for monitoring of such parking

Appendix 1

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Technical Note - Strategic Site Allocations Impact
Thanet Local Plan Evidence Base

CO04300697/TN-01 Revision 02

July 2018

Document Control Sheet

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Contents

1 Introduction 1
Background 1
Study Area 1
2 Key Local Plan Sites 3
Introduction 3
Site Allocations 3
Trip Generation and Trip Distribution 4
3 Analysis 5
Introduction 5
Method 6
4 Apportionment of Developer Contributions 9
Inner Circuit of Highway Improvements 9
Proportionate Impact 10
Apportionment 11

Figures

Figure 1: Study Area 2
Figure 2: Development sites 4
Figure 3: Schemes 6
Figure 4: Select links for Acol Hill to Shottendane 7
Figure 5: Select links for Shottendane Rd 7
Figure 6: Select links for Manston-Haine link 8
Figure 7: Proportions by scheme 10
Figure 8: Proportion by site 10

Tables

Table 1: Site Allocation 3
Table 2: Inner Circuit Highway Improvements 9
Table 3: Estimated Contribution through Impact Apportionment 11

1 Introduction

Background

Amey have been commissioned by Kent County Council (KCC) to create a high-level developer contribution apportionment methodology that will provide an indication of the likely schedule of contributions necessary to ensure highways mitigation measures are delivered. This has involved using the SATURN model which has been used in the local plan modelling.

Purpose of this Note

This technical note summarises the methodology used. This has involved:

- Using select link analysis on the new infrastructure and the routes relieved from their provision. This was undertaken in the Do-Something (with-scheme) scenario of the SATURN model.
- Identifying key Local Plan Sites;
- Applying trip rates for new developments (as used in SATURN modelling);
- Applying site specific trip distributions (as used in SATURN modelling);
- Calculating proportion of development impact on inner circuit proposals; and
- Apportioning developer contributions.

Study Area

The area covered by the SATURN model is shown in Figure 1.

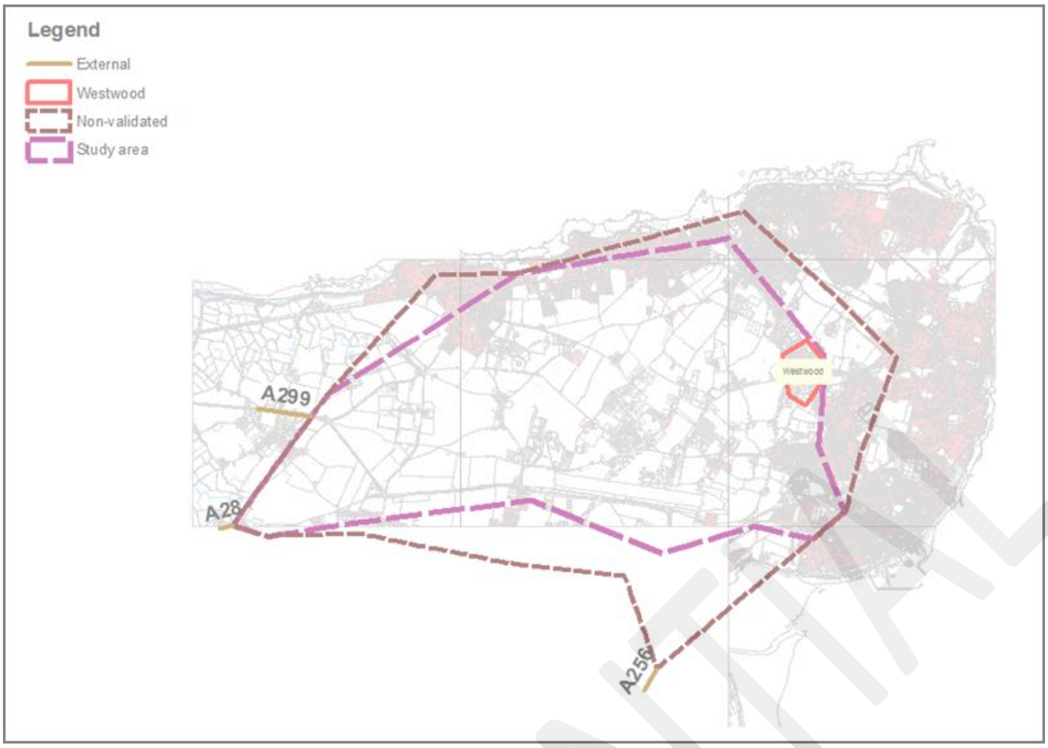


Figure 1: Study Area

2 Key Local Plan Sites

Introduction

As part of the Local Plan, several sites within the District have been identified by Thanet District Council (TDC) as potential locations for residential development in the emerging local plan. As such the methodology has considered these sites and their required inclusion.

Site Allocations

A total of five strategic sites have been identified across the District, shown in Table 1 and Figure 2. The likely level of development associated with each of the sites has been agreed with KCC in advance for the purposes of this model assessment. These are the strategic sites in the emerging local plan which are seeking planning permission and does not include sites with permission or resolutions (Manston Green, Eurokent, Westwood Housing and Manston/Nash Roads).

Table 1: Site Allocation

Site Name	Development Proposals
Westwood (Nash Road)	1,450 dwellings
Manston Court Road / Haine Road	1,400 dwellings This comprises a current planning application for 700 dwellings, a neighbouring site of 200 dwellings and a proposed extension of 500 dwellings).
Hartsdown/Shottendane Roads & Shottendane/Manston Roads sites (combined site)	550 dwellings
Birchington	1,600 dwellings
Westgate	2,000 dwellings

Figure 2: Development sites

Trip Generation and Trip Distribution

The Trip Generation and Trip Distribution are described in the Forecasting Report (ref: CO04300697_001~01). However, for convenience, it is clarified here that the strategic sites use a generic trip rate and the distribution for a site is based on the relevant or neighbouring zone.

3 Analysis

Introduction

The SATURN model has a Do Something (DS / 'with scheme') scenario that includes key roads that connect future developments with the study area including the inner circuit of highway improvements proposed as part of the Thanet District Transport Strategy, namely:

- Acol Hill to Shottendane Road Link;
- Shottendane Road Corridor Improvement;
- Manston Road to Haine Road Link;
- Columbus Avenue Extension;
- Brooksend to Minnis Road Link (on-site);
- Brooksend Hill to Acol Hill Link (on site); and
- Nash Road Corridor Improvement (on site).

The analysis addresses the first four schemes on this list and does not consider the on-site improvements at this time. The on-site infrastructure elements have not been included or costed as it is considered that they would have had to be built to serve the developments sites. The proposed schemes are shown as Figure 3.

Figure 3: Schemes

Method

For each piece of infrastructure and any corridor relieved, select links were extracted from the SATURN model. These results were embedded into a spreadsheet and simple calculations undertaken. The total trips from the listed strategic sites were extracted and the proportion from each development was calculated.

Select links by scheme section

Acol Hill to Shottendane Road link – this uses select links as shown in Figure 4:

Figure 4: Select links for Acol Hill to Shottendane

Shottendane Road improvements – this uses select links as shown in Figure 5:

Due to the location of the Westgate development between Minster Road and Garlinge High St the links used are east and west of the site on both Shottendane Road and the A28.

Figure 5: Select links for Shottendane Rd

Manston-Haine link – this uses select links as shown in Figure 6, namely the proposed new link and the existing A256:

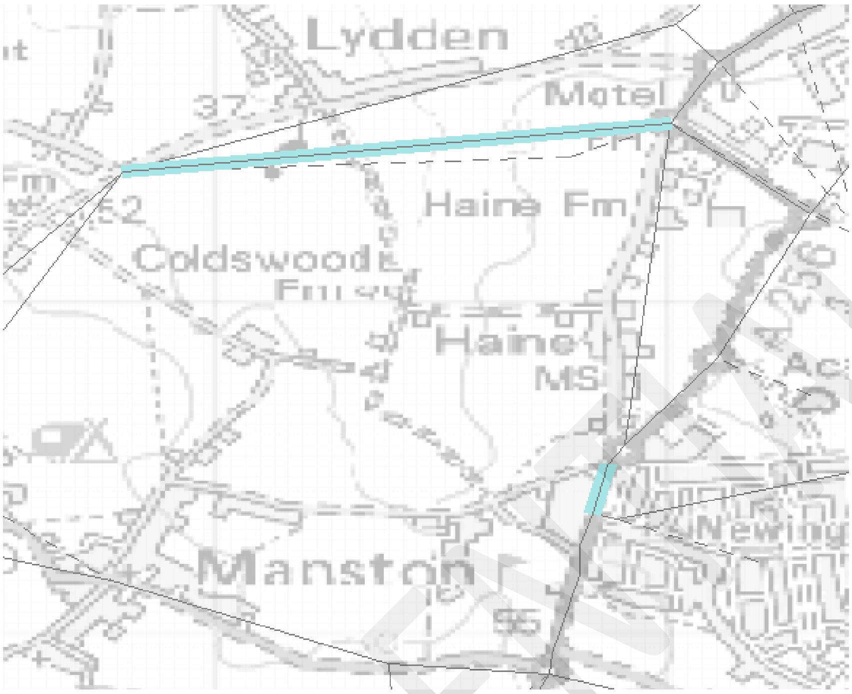


Figure 6: Select links for Manston-Haine link

Columbus Ave extension - the approach used considered the new link in isolation. This notes that the existing corridor through Acol village has been assumed free from through-traffic in the 'with-scheme' situation.

4 Apportionment of Developer Contributions

Inner Circuit of Highway Improvements

The inner circuit encompasses a number of key highway interventions, which will be delivered in conjunction with the relevant strategic sites. Table 2 identifies the four key highway interventions along with a basic estimated cost of the required highway improvements as established by KCC.

Table 2: Inner Circuit Highway Improvements

Highway Intervention	Estimated Cost
Acol Hill to Shottendane Road Link	£5,000,000
Shottendane Road Corridor Improvement	£15,000,000
Manston Road to Haine Road Link	£13,000,000
Columbus Avenue Extension	£10,000,000

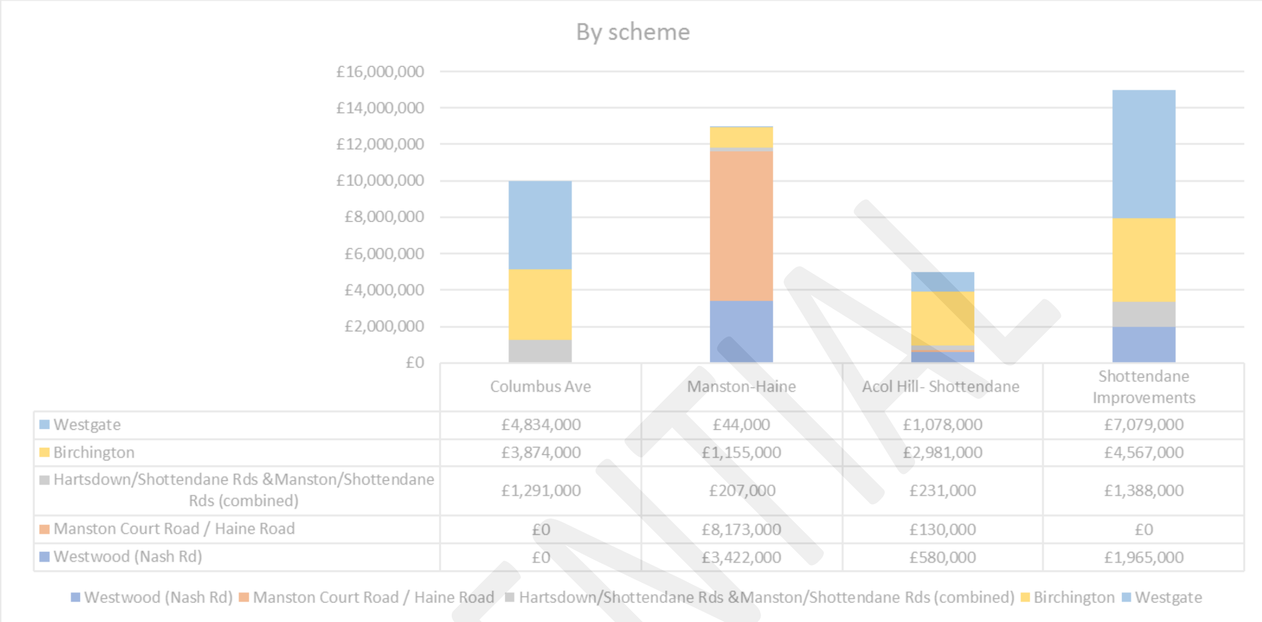
The estimated costs are indicative at this stage and may be subject to change as schemes develop.

The figures in Table 2 represent the costs involved in KCC delivering the schemes through section 106 contributions (indexation uplift will need to be applied to each scheme cost at the time relevant legal agreements are signed). An alternative approach to infrastructure delivery directly by developers through section 278 agreements (in lieu of financial contributions) may also be acceptable.

The schemes listed in Table 2 may also require compulsory purchase of third party land by the Local Planning Authority. Developers will be required to indemnify any costs involved in acquiring land necessary to deliver each scheme.

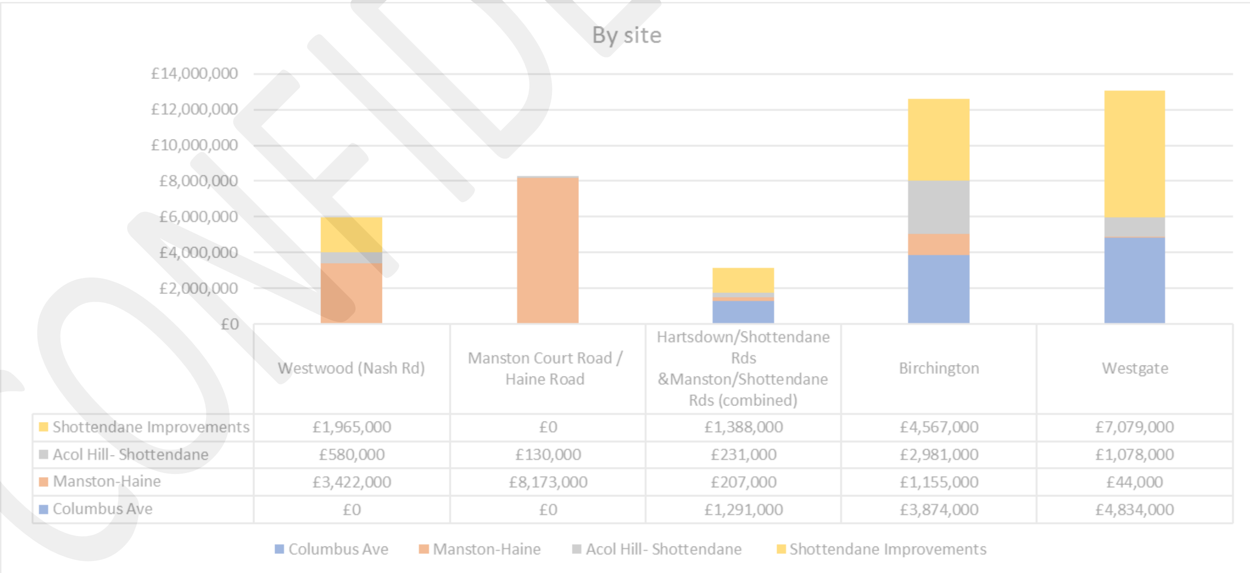
Proportionate Impact

The results of the methodology are shown disaggregated by both scheme and by site (Figure 7 and Figure 8).



	Columbus Ave	Manston-Haine	Acol Hill- Shottendane	Shottendane Improvements
Westgate	£4,834,000	£44,000	£1,078,000	£7,079,000
Birchington	£3,874,000	£1,155,000	£2,981,000	£4,567,000
Hartsdown/Shottendane Rds &Manston/Shottendane Rds (combined)	£1,291,000	£207,000	£231,000	£1,388,000
Manston Court Road / Haine Road	£0	£8,173,000	£130,000	£0
Westwood (Nash Rd)	£0	£3,422,000	£580,000	£1,965,000

Figure 7: Proportions by scheme



	Westwood (Nash Rd)	Manston Court Road / Haine Road	Hartsdown/Shottendane Rds &Manston/Shottendane Rds (combined)	Birchington	Westgate
Shottendane Improvements	£1,965,000	£0	£1,388,000	£4,567,000	£7,079,000
Acol Hill- Shottendane	£580,000	£130,000	£231,000	£2,981,000	£1,078,000
Manston-Haine	£3,422,000	£8,173,000	£207,000	£1,155,000	£44,000
Columbus Ave	£0	£0	£1,291,000	£3,874,000	£4,834,000

Figure 8: Proportion by site

Apportionment

Based upon the proportions identified, contributions could be taken and pooled to allow KCC to deliver the highway improvements when sufficient funds were available. However, this would result in a significant risk to the provision of the necessary highway improvements, impacting on the delivery of the plan's key site allocations and placing an unacceptable risk for delivery with KCC and a consequent stress on the operation of the local highway network.

To reduce the delivery risk outlined above to KCC it is recommended that a mechanism that allocates delivery of each of the highway schemes to one of the five remaining key allocation sites be applied.

One possible approach to this could be to allocate a highway improvement scheme to each development at cost akin to that estimated if the contributions were equally apportioned, therefore reducing the risks to the delivery of highway improvements.

Impact Apportionment

Table 3 shows the likely contribution by strategic site if the costs were apportioned based on impact. These are the spreadsheet results rounded to £1000.

Table 3: Estimated Contribution through Impact Apportionment

Strategic Site	Estimated Contribution
Westwood (Nash Rd)	£5,967,000
Manston Court Road / Haine Road	£8,303,000
Combined site	£3,117,000
Birchington	£12,577,000
Westgate	£13,035,000

Suggested Apportionment

Based upon the contributions identified in

Table 3, it has been attempted to allocate delivery of the four key highway improvements (i.e. excluding on-site) to individual sites either wholly or more meaningfully between two sites. The following shows a proposed allocation of developer contributions:

- Westwood (Nash Road) - 40% towards the Manston Road to Haine Road Link (circa £5,200,000);
- Manston Court Road / Haine Road - 60% towards the Manston Road to Haine Road Link (circa £7,800,000);
- Hartsdown/Shottendane Roads & Shottendane/Manston Roads sites (combined site) - 20% towards the Shottendane Road Corridor Improvement (circa £3,000,000)
- Birchington - Acol Hill to Shottendane Road Link and 80% of Columbus Ave (circa £13,000,000) and;
- Westgate – 80% towards the Shottendane Road Corridor Improvement and 20% of Columbus (circa £14,000,000).

This is only indicative and would be reviewed as site-delivery progresses.

Appendix 2

Technical note:
Response to Transport Hearing Actions

1. Introduction

1.1.1 This Note has been produced in response to a number of the Actions set by the Examining Authority during and following the Transport Hearing on 6th June 2019.

1.1.2 A number of separate Technical Notes have been produced and updates to the transport related DCO documents have been made. Reference to these is made where relevant

2. Action 30

Note on where the figure of 58 vehicle movements (30% of 193) in response to Third Written Question TR.3.20 ii) for trip generation in the am peak has been derived.

2.1.1 This was a miscalculation. The figure should have been 24 arrivals and 14 departures, totalling 38 vehicles (rounded up to complete vehicles). This is based on

- 30% passenger arrivals for a departing flight carrying 170 passengers = 51
  - 10% travel by bus = 5 passengers = 1 bus x 2 (arriving and departing)
  - 6% travel by taxi = 3 - with a 1.92 vehicle occupancy = 2 vehicles x 2 (arriving and departing)
  - 37% travel by car (parked) = 19 - with a 1.92 vehicle occupancy = 10 vehicles (arriving only)
  - 37% travel by car (drop off) = 19 - with a 1.92 vehicle occupancy = 10 vehicles x 2 (arriving and departing)
  - 10% travel by rail and bus = 5 passengers = 1 bus x 2 (arriving and departing)

2.1.2 In responding to this action, a review of the spreadsheet calculations identified two errors which had been applied to the traffic generation in both the DCO TA and the Revised TA:

- double counting of in and out trips for taxis and car drop off for passenger departure and arrival flights.
- departure trips out of the airport following a passenger arrival flight were allocated in the same time period as the flight arrival rather than 1 hour after arrival as identified in the TA.

2.1.3 A technical note has been produced which sets out the full methodology for the passenger traffic generation calculations and presents the difference between the amended passenger traffic generation and the passenger traffic generation presented in the DCO TA and the RTA. This shows:

- a reduction in AM peak hour traffic generation of 141 vehicles compared to the revised traffic generation in the RTA; and
- a marginal increase in the PM peak hour traffic generation of 11 vehicles compared to the revised traffic generation in the RTA.

3. Action 31

Provide a note on sensitivity testing of junctions with additional passenger traffic in am peak (based on a reasonable worst case).

3.1.1 Based on the amended passenger traffic generation calculations, there was an overestimation of the AM peak hour traffic of 141 vehicles. The DCO TA and the RTA present a robust assessment of the AM peak hour that equates to more than an additional passenger departure flight.

3.1.2 An assessment has been undertaken of the additional PM traffic as a result of the changes to the flight departure passenger arrival assumptions. This has been presented as a separate technical note and concludes that no further mitigation is required.

4. Action 32

Provide a note considering proportional impacts of extended study area to take into account vehicle movements leaving/ entering the study area at A299 Thanet Way at St Nicholas at Wade and the A256.

Also, consideration of any impact this might have on study area of original Transport Assessment (TA).

The Examining Authority (ExA) notes that the Applicant agreed to convert percentages to vehicle numbers at Highways England's request

4.1.1 A proportional impact assessment has been undertaken and presented in a separate technical note.

4.1.2 This concludes that the approach taken in the TA is robust as junction assessments have been undertaken where development traffic flows are relatively low and mitigation schemes and contributions have been identified.

4.1.3 Extending the study area along the A256 or the A299 has been demonstrated to be not a requirement as the development traffic flows are less than 5% which is within the accepted variance for daily traffic flows.

5. Action 33

Provide a note on the propensity for, and potential impacts of, clustering on HGV movement

5.1.1 There are likely to be lower HGV movements in the peak periods and higher flows in the off-peak, as commercial operators will seek to avoid congested periods to avoid inefficiency. Any clustering of HGV movements is therefore not likely to coincide with peak traffic hours.

5.1.2 Any clustering is unlikely to have a material impact on the transport network, e.g. a 50% uplift would result in an extra 5 HGVs in an hour.

6. Action 34

Provide a HGV strategy, including routing plans, restrictions on timings (such as peak hour caps), methods of ensuring compliance and enforcement.

6.1.1 A Freight Management Strategy has been produced as a separate report and reference to it has been included in the Framework Travel Plan.

7. Action 35

Respond to Highways England's suggestion for Travel Plan.

7.1.1 The requirement for businesses operating out of the Airport – airside or Northern Grass Area, to implement and monitor their own Travel Plans has been included within the framework Travel Plan

8. Action 36

Provide a note setting out reasons why the proposed Manston-Haine link road cannot transect the Northern Grass Area.

8.1.1 A Note has been produced which setting out reasons why the proposed Manston-Haine link road cannot transect the Northern Grass Area

9. Action 42

Provide a note showing how the contributions for each junction set out in the draft s106 agreement have been calculated and their timings established. Indicate whether the costing estimates have been agreed with KCC.

9.1.1 A Technical Note has been produced with the costings included in the Appendices.

10. Action 43

Provide a technical note on the effects that changes made in the revised TA methodology (in terms of modal split (shared taxi) and the timing of passenger arrivals before flights) would have on the modelling and results in the original TA.

10.1.1 An assessment has been undertaken of the additional PM traffic as a result of the changes to the flight departure passenger arrival assumptions. This has been presented as a separate technical note and concludes that no further mitigation is required.

11. Action 44

Submit Stage 1 Road Safety Audits and design responses for junction improvement schemes that were needed in the original TA, but not the revised TA.

11.1.1 Stage 1 Road Safety Audits (RSA) have been undertaken for:

- Junction 13 – Manston Court Road/Manston Road signal scheme
- Junction 26 -Newington Road/Manston Road
- Junction 27 – Newington Road/High Street

11.1.2 A Designer's Response and revised Stage 1 RSA has been submitted to the ExA for:

- Junction 13 – Manston Court Road/Manston Road signal scheme

11.1.3 A Designer's Response and revised Stage 1 RSA has not been completed for the other two junctions as the auditor's problems and recommendations could not be resolved. Further consideration has been given to the constraints to improvement at the junction and the volume of development traffic at both the junctions, which is 38 vehicles in the AM peak and 36 vehicles in the PM peak hour. It has been concluded that there is limited opportunity to improve the junction and the scale of development traffic does not result in a severe impact. These schemes are therefore no longer being taken forward.

11.1.4 Stage 1 RSAs have not been undertaken of the following improvement schemes as the auditor did not warrant the proposed changes to necessitate an RSA.

- J1 – A256/Sandwich Road
- J10 – Shottendane Road/Manston Road/Margate Hill
- J17 – Ramsgate Road/Poorhole Lane/Margate Road/Star Lane

12. Action 45

Provide a note on the intended locations of emergency accesses and how these might be appropriately secured at this stage of the examination.

12.1.1 A separate Technical Note on this has been produced.

13. Action 46

Provide a note on the possible need for improvements to pedestrian pavements and footpaths in Manston Village to increase pedestrian accessibility to the airport and to address any safely issues arising from increased traffic flows including with reference to PRoW TR10.

13.1.1 The draft S106 Obligation includes funding for improvements to PRoW TR10 which is considered an acceptable and appropriate means of connecting to Manston Village and the expanding population to the east due to the Manston Green development. This is in line with PRoW Officer comments requests for a contribution and completion of an upgrade to the link.

13.1.2 The population of Manston is small (100 houses or less), and the potential usage by residents of a footway alongside the B2050 from the village to the Airport is limited. The improvement of TR10 has the potential to attract higher usage as it will provide a connection to the Manston Green development, comprising 800 homes, as well as Manston Village and the western outskirts of Ramsgate.

14. Action 47

Provide a note on current considerations of whether to provide bus service for staff or to contribute to an existing service. Provide financial contribution figures in draft s106 agreement.

14.1.1 The Transport Assessment assumes that 10% of passenger trips will be by bus and rail and bus and 6% of staff trips will be by bus by Year 20. These are targets that are included in the Travel Plan and will be regularly monitored through surveys and reviewed.

14.1.2 The Applicant will provide buses for passengers which will include a shuttle service between the proposed Thanet Parkway (or Ramsgate Station) with services timed to coincide with flight arrivals/departures and train arrivals and departures.

14.1.3 The Applicant will provide buses for staff with routeing and timing to be based on staff home locations and shift patterns.

14.1.4 There are KCC funded bus services which route along Manston Road and it may be appropriate for there to be enhancement of these, such as increased frequency and early/late start and finish times, if they are still operating when the Airport becomes operational.

14.1.5 As bus plans and timetables are not typically planned years in advance, meaningful engagement with KCC and bus operators at this stage is not applicable.

14.1.6 Discussion will be held at an appropriate point in the future to identify the optimum provision.

15. Action 48

Clarify if the REAC is the appropriate place to secure a shuttle bus service and other public transport measures.

15.1.1 The REAC has been submitted to account for the additional comments from ExA (e.g.) 10% electric charging provision.

16. Action 49

Review the commitments in Framework Travel Plan (provide more details of commitments and targets).

16.1.1 A review of the Framework Travel Plan and the commitments has been undertaken and a revised document has been produced.

17. Action 50

Provide a note about the Car Park Management Strategy, in relation to apparent overprovisions in parking spaces considering number of passenger flights proposed – include a parking compliance strategy, and consideration of any implications for Compulsory Acquisition, including the possible use of this area as a construction compound.

Set out details of passenger mode share assumptions applied and their alignment with those applied in the TA.

17.1.1 The space identified for flexible overspill parking will be a construction compound during the construction phases and can only be used only after the works are complete in Phase 4 of the construction programme.

17.1.2 As set out in the CPMS, the space for "overflow parking" will ensure that there are no issues with overspill parking onto surrounding areas. In addition, it will enable flexibility of size of spaces: blue badge parking and electric vehicle parking have larger dimensions than standard size spaces.

17.1.3 A large area of this space is now also been ear marked for hire car facilities onsite, which will again reduce the number of spaces in the overflow parking area. As an example, at Southend Airport there are two car parks related to car hire. One car park of around 130 parking spaces for hire cars returned cars, and another of around 50 for cars that are near the terminal ready to be picked up by passengers arriving.

17.1.4 Finally, many airport sites now operate a pre-booked car drop off facility and this may also be proposed at Manston. The space required for this facility would come out of the area designed for parking.

17.1.5 As such it is considered that with numerous unknowns on the site between design of blue badge and electric spaces, hire car company's needs, nature and timing of flights and seasonality of arrivals and departures at the airport that a large over provision is needed to allow for a car park facility that accommodates for all needs in an efficient manner

17.1.6 The passenger mode share assumptions are set out in Table 2.2 of the Car Park Management Strategy. These have been based on modal shares at other airports.

17.1.7 A technical note has been produced which sets out the results of a re-run of the parking model based on the modal share assumptions and targets which have formed the basis for the transport assessment and the Travel Plan and the estimated vehicle occupancies.

17.1.8 The model results indicate the following parking provision requirement:

- 1,609 longer term parking spaces;
- 125 Short Stay "drop off" parking spaces, comprising:
  - 22 short stay parking spaces;
  - 88 car drop off/pick up spaces (based on passenger traffic generation figures); and

  - o 15 taxi spaces (based on passenger traffic generation figures)
- 1,734 total parking spaces required.

17.1.9 This is 81 fewer spaces than that identified in in the CPMS (-4%) which is considered to be within a reasonable range

18. Action 52

Include a 'Blue Badge' parking strategy in car parking strategy and arrangements for monitoring of such parking

18.1.1 The Car Park Management Strategy has been updated to include Blue Badge and Electric Vehicle (EV) parking. This has been submitted at Deadline 8.

Issued by

[redacted]...........

Approved by

[redacted]..

Appendix ISH7 – 30

Technical note:
Airport Passenger Traffic Generation

1. Introduction

1.1.1 At the Transport Hearing on 6th June the Examining Authority requested clarification on the first principles approach for passenger traffic generation as set out in the DCO Transport Assessment (TA) and Revised TA.

1.1.2 In responding to this request a review of the spreadsheet calculations identified two errors which had been applied to the traffic generation in both the DCO TA and the Revised TA:

- double counting of in and out trips for taxis and car drop off for passenger departure and arrival flights.
- departure trips out of the airport following a passenger arrival flight were allocated in the same time period as the flight arrival rather than 1 hour after arrival as identified.

1.1.3 This Technical Note provides further information on the methodology for estimating passenger traffic generation as set out in section 6.4 of the DCO TA, with the revised assumptions on passenger arrival times before a departure flight and extraction of shared taxi mode share.

1.1.4 The results of the amended calculation show a lower volume of development traffic overall.

- In the AM peak hour there are 141 fewer trips than the revised traffic generation in the Revised TA; and
- In the PM peak hour there is a marginal increase of 11 vehicles compared to the revised traffic generation in the Revised TA.

1.1.5 The overestimation of the AM peak hour traffic is comparable to the traffic generation for departure and arrival flights which would affect the AM peak hour. On this basis, the DCO TA has been robust and has assessed a situation equivalent to departure/arrival flights affecting the AM peak hour.

2. Traffic Generation Methodology

2.1 Passenger Flight Assumptions

2.1.1 The DCO TA set out the assumptions regarding passenger flights which were based on passenger flight patterns from comparable airports and information on anticipated flight carriers provided by the Applicant.

2.1.2 Passenger movements were derived based on assumptions of numbers of passengers per carrier. **Table 2.1** sets out the passenger movements that were assumed in the DCO TA and the RTA.

Table 2.1 Total Passengers per Departure Flights and Arrival Flights Per Hour

Time Period	Departure Flights	Arrival Flights
06:00 - 07:00	170.10	
07:00 - 08:00	340.20	
08:00 - 09:00	52	170.10
09:00 - 10:00		170.10
10:00 - 11:00		
11:00 - 12:00		170.10
12:00 - 13:00		52
13:00 - 14:00	170.10	170.10
14:00 - 15:00	170.10	170.10
15:00 - 16:00	340.20	170.10
16:00 - 17:00	170.10	170.10
17:00 - 18:00	52	
18:00 - 19:00	340.20	52
19:00 - 20:00	170.10	170.10
20:00 - 21:00		170.10
21:00 - 22:00		170.10
22:00 - 23:00		170.10
TOTAL	**1975.10**	**1975.10**

2.1.3 Based on post DCO discussions with KCC, revisions were made to the assumptions on passenger arrivals before a flight departure and modal share.

2.1.4 The assumptions on passenger arrivals before a flight departure and passenger departures after a flight arrival are as follows:

- 70% of departing passengers would arrive at the airport two hours before flight departure;
- 30% of departing passengers would arrive at the airport three hours before flight departure; and
- 100% of all arriving passengers would depart the airport site one hour after flight arrives.

2.1.5 The resultant passenger arrivals and departures to and from the airport are shown in **Table 2.2**.

Table 2.2 Total Passengers Arrival and Departures at Airport

Time Period	Passenger Arrivals at Airport	Passenger Departures from Airport
03:00 – 04:00	51	
04:00 – 05:00	221	
05:00 – 06:00	254	
06:00 – 07:00	36	
07:00 – 08:00		
08:00 – 09:00		
09:00 – 10:00		170
10:00 – 11:00	51	170
11:00 – 12:00	170	
12:00 – 13:00	221	170
13:00 – 14:00	289	52
14:00 – 15:00	135	170
15:00 – 16:00	138	170
16:00 – 17:00	289	170
17:00 -18:00	119	170
18:00 -19:00		
19:00 -20:00		52
20:00 – 21:00		170
21:00 – 22:00		170
22:00 – 23:00		170
23:00 – 24:00		170
TOTAL	**1975.1**	**1975.1**

2.2 Modal Share Assumptions

2.2.1 The assumptions on day time mode share, as agreed with KCC, are shown in **Table 2.3**.

Table 2.3 Passenger Mode Share Assumptions (Day – 5am – 10pm)

Mode of Transport	Initial	10 years	20 years
Bus	3.33%	6.67%	10.00%
Taxi	5.33%	5.67%	6.00%
Car Parked	45.67%	41.33%	37.00%
Car drop off	45.67%	41.33%	37.00%
Rail (Then Bus)	N/A	5.0%	10.0%
Total	**100%**	**100%**	**100%**

2.2.2 The assumptions on night time mode share, which have been agreed with KCC, are shown in **Table 2.4**. The night time period is defined as 10pm to 5am.

Table 2.4 Passenger Mode Share Assumptions (Night – 10pm – 5am)

Mode of Transport	Initial	10 years	20 years
Taxi	6.4%	9.6%	12.67%
Car Parked	46.8%	45.2%	43.67%
Car drop off	46.8%	45.2%	43.67%
Total	**100%**	**100%**	**100%**

2.2.3 The resultant assumptions on passenger arrivals and departures by mode share in Year 20 are set out in **Table 2.5**.

Table 2.5 Year 20 Passengers by Mode Share by Departure Flights and Arrival Flights

Time Period	Bus		Taxi		Car Parked		Car Drop Off		Rail (then bus)	
	Dep Flights	Arrival Flights	Dep Flights	Arrival Flights	Dep Flights	Arrival Flights	Dep Flights	Arrival Flights	Dep Flights	Arrival Flights
03:00 – 04:00	N/A	N/A	6		22		22		N/A	N/A
04:00 – 05:00	N/A	N/A	28		97		97		N/A	N/A
05:00 – 06:00	25		15		94		94		25	
06:00 – 07:00	4		2		13		13		4	
07:00 – 08:00										
08:00 – 09:00										
09:00 – 10:00		17		10		63		63		17
10:00 – 11:00	5	17	3	10	19	63	19	63	5	17
11:00 – 12:00	17		10		63		63		17	
12:00 – 13:00	22	17	13	10	82	63	82	63	22	17
13:00 – 14:00	29	5	17	3	107	19	107	19	29	5

Time Period	Bus		Taxi		Car Parked		Car Drop Off		Rail (then bus)	
	Dep Flights	Arrival Flights	Dep Flights	Arrival Flights	Dep Flights	Arrival Flights	Dep Flights	Arrival Flights	Dep Flights	Arrival Flights
14:00 – 15:00	13	17	8	10	50	63	50	63	13	17
15:00 – 16:00	14	17	8	10	51	63	51	63	14	17
16:00 – 17:00	29	17	17	10	107	63	107	63	29	17
17:00 -18:00	12	17	7	10	44	63	44	63	12	17
18:00 -19:00										
19:00 -20:00		5		3		19		19		5
20:00 – 21:00		17		10		63		63		17
21:00 – 22:00		17		10		63		63		17
22:00 – 23:00	N/A	N/A		22		74		74	N/A	N/A
23:00 – 24:00	N/A	N/A		22		74		74	N/A	N/A
TOTAL[1]	**170**	**164**	**137**	**141**	**749**	**753**	**749**	**753**	**170**	**164**

[1.] Total numbers taken from calculations. Numbers in table per hour are rounded figures

2.3 Vehicle Occupancies

2.3.1 Assumptions were made on vehicle occupancies as follows.

- Shuttle buses/buses – this would depend on the type of vehicle and level of demand. A midi-bus service would carry up to 38 passengers and a full length bus up to 53 passengers. For the purpose of the estimations, it has been assumed that there would be up to two buses and two shuttle buses to /from Thanet Parkway per hour, equating to four two-way trips.
- Taxi, car (parked) and car drop off/pick up – an average of 1.92 passengers per vehicle based on information from the CAA "Passenger Survey Report 2016" on business/leisure trips and assumptions on vehicle occupancy for each:
  - 19.5% trips are for business and car occupancy will be 1.2 passengers per vehicle; and
  - 80.5% trips are for leisure and car occupancy will be 2.1 passengers per vehicle.

2.4 Two Way Vehicle Trips

2.4.1 In identifying passenger traffic generation, account needs to be taken of the two-way vehicle movements, e.g. a car arriving at the airport to drop off passengers will result in a vehicle departure. The following sections set out the assumptions for all modes.

Bus

2.4.2 It has been assumed that there would between two buses per hour to serve passengers on flight departures and arrivals. **Table 2.6** sets out the bus movements.

Table 2.6 Bus movements to and from Manston Airport

Time Period	Departure Flights Passenger Arrival	Arrival Flights Passenger Departure	Combined	Bus Movements Vehicle Arrival	 Vehicle Departure
05:00 – 06:00	25		25	2	2
06:00 – 07:00	4		4	2	2
07:00 – 08:00			-	2	2
08:00 – 09:00			-	2	2
09:00 – 10:00		17	17	2	2
10:00 – 11:00	5	17	22	2	2
11:00 – 12:00	17		17	2	2
12:00 – 13:00	22	17	39	2	2
13:00 – 14:00	29	5	34	2	2
14:00 – 15:00	13	17	30	2	2
15:00 – 16:00	14	17	31	2	2
16:00 – 17:00	29	17	46	2	2
17:00 -18:00	12	17	29	2	2
18:00 -19:00				2	2
19:00 -20:00		5	5	2	2
20:00 – 21:00		17	17	2	2
21:00 – 22:00		17	17	2	2
TOTAL[1]	**170**	**164**	**334**	**34**	**34**

[1] Total numbers taken from calculations. Numbers in table per hour are rounded figures

Taxi

2.4.3 The following arrival/departure assumptions have been made:

- Flight departure – taxis arriving to drop off a passenger will leave in the same hour of arrival unless there is a flight arrival due.
- Flight arrival – taxis will arrive in the hour of the flight arrival unless taxis have remained after a flight departure drop off.

2.4.4 As such the maximum number of arrival vehicles has been used in each hour for the combined arrivals to the airport and the departures are proposed to be the same as the arrivals. **Table 2.7** sets out the taxi movements.

Table 2.7 Taxi movements to and from Manston Airport

Time Period	Departure Flights		Arrival Flights		Combined	
	Arrival	Departure	Arrival	Departure	Arrival	Departure
03:00 – 04:00	3	3			3	3
04:00 – 05:00	15	15			15	15
05:00 – 06:00	8	8			8	8
06:00 – 07:00	1	1			1	1
07:00 – 08:00	0	0			0	0
08:00 – 09:00	0	0	5		5	5
09:00 – 10:00	0	0	5	5	5	5
10:00 – 11:00	2	2	0	5	5	5
11:00 – 12:00	5	5	5	0	5	5
12:00 – 13:00	7	7	2	5	7	7
13:00 – 14:00	9	9	5	2	9	9
14:00 – 15:00	4	4	5	5	5	5
15:00 – 16:00	4	4	5	5	5	5
16:00 – 17:00	9	9	5	5	9	9
17:00 -18:00	4	4	0	5	5	5
18:00 -19:00	0	0	2	0	5	5
19:00 -20:00	0	0	5	2	5	5
20:00 – 21:00	0	0	5	5	5	5
21:00 – 22:00	0	0	11	5	11	11
22:00 – 23:00	0	0	11	11	11	11
23:00 – 00:00				11	11	11
TOTAL[1]	**71**	**71**	**73**	**73**	**139**	**139**

[1] Total numbers taken from calculations. Numbers in table per hour are rounded figures

Car Parked

2.4.5 Cars parked at the airport have one arriving trip for departure flights and one departing trip for arrival flights. **Table 2.8** sets out the car (parked) movements.

Table 2.8 Car (parked) movements to and from Manston Airport

Time Period	Departure Flights		Arrival Flights		Combined	
	Arrival	Departure	Arrival	Departure	Arrival	Departure
03:00 – 04:00	12				12	
04:00 – 05:00	50				50	
05:00 – 06:00	49				49	
06:00 – 07:00	7				7	
07:00 – 08:00						
08:00 – 09:00						
09:00 – 10:00				33		33
10:00 – 11:00	10			33	10	33
11:00 – 12:00	33				33	
12:00 – 13:00	43			33	43	33
13:00 – 14:00	56			10	56	10
14:00 – 15:00	26			33	26	33
15:00 – 16:00	27			33	27	33
16:00 – 17:00	56			33	56	33
17:00 -18:00	23			33	23	33
18:00 -19:00						
19:00 -20:00				10		10
20:00 – 21:00				33		33
21:00 – 22:00				33		33
22:00 – 23:00				39		39
23:00 – 00:00				39		39
TOTAL[1]	**389**	**N/A**	**N/A**	**392**	**389**	**392**

[1] Total numbers taken from calculations. Numbers in table per hour are rounded figures

Car Pick Up/Drop Off

2.4.6 The following is assumed regarding the two way trips:

- Flight Departures – the car departs the airport in the same hour as it arrives;
- Flight Arrivals – the car arrives at the airport in the same hour of the flight arrival and departs the airport one hour after flight arrival.

2.4.7 **Table 2.9** sets out the car drop off/pick up movements.

Table 2.9 Car drop off/pick up movements to and from Manston Airport

Time Period	Departure Flights		Arrival Flights		Combined	
	Arrival	Departure	Arrival	Departure	Arrival	Departure
03:00 – 04:00	12	12			12	12
04:00 – 05:00	50	50			50	50
05:00 – 06:00	49	49			49	49
06:00 – 07:00	7	7			7	7
07:00 – 08:00						
08:00 – 09:00			33		33	
09:00 – 10:00			33	33	33	33
10:00 – 11:00	10	10		33	10	43
11:00 – 12:00	33	33	33		65	33
12:00 – 13:00	43	43	10	33	53	75
13:00 – 14:00	56	56	33	10	88	66
14:00 – 15:00	26	26	33	33	59	59
15:00 – 16:00	27	27	33	33	59	59
16:00 – 17:00	56	56	33	33	88	88
17:00 -18:00	23	23		33	23	56
18:00 -19:00			10		10	
19:00 -20:00			33	10	33	10
20:00 – 21:00			33	33	33	33
21:00 – 22:00			39	33	39	33
22:00 – 23:00			39	39	39	39
23:00 – 00:00				39		39
TOTAL[1]	**389**	**389**	**392**	**392**	**781**	**781**

[1.] Total numbers taken from calculations. Numbers in table per hour are rounded figures

Rail then Bus

2.4.8 The same assumptions have been made as for buses. **Table 2.10** sets out the rail then bus movements.

Table 2.10 Rail then bus drop off/pick up movements to and from Manston Airport

Time Period	Departure Flights	Arrival Flights	Combined	Bus Movements	
	Passenger Arrival	Passenger Departure		Vehicle Arrival	Passenger Arrival
05:00 – 06:00	25		25	2	2
06:00 – 07:00	4		4	2	2
07:00 – 08:00			-	2	2
08:00 – 09:00			-	2	2
09:00 – 10:00		17	17	2	2
10:00 – 11:00	5	17	22	2	2
11:00 – 12:00	17		17	2	2
12:00 – 13:00	22	17	39	2	2
13:00 – 14:00	29	5	34	2	2
14:00 – 15:00	13	17	30	2	2
15:00 – 16:00	14	17	31	2	2
16:00 – 17:00	29	17	46	2	2
17:00 -18:00	12	17	29	2	2
18:00 -19:00				2	2
19:00 -20:00		5	5	2	2
20:00 – 21:00		17	17	2	2
21:00 – 22:00		17	17	2	2
TOTAL[1]	**170**	**164**	**334**	**34**	**34**

[1] Total numbers taken from calculations. Numbers in table per hour are rounded figures

2.5 Passenger Traffic Generation Summary

2.5.1 The traffic generations for each of the modal shares have been combined. **Table 2.11** sets out the total arrivals and departures by cars and buses.

Table 2.11 Total Passenger Traffic Generation Summary

Time Period	Cars		Buses		Total	
	Arrival	Departure	Arrival	Departure	Arrival	Departure
03:00 – 04:00	27	15			27	15
04:00 – 05:00	115	65			115	65
05:00 – 06:00	105	57	4	4	109	61
06:00 – 07:00	15	8	4	4	19	12
07:00 – 08:00	0	0	4	4	4	4
08:00 – 09:00	**38**	**5**	**4**	**4**	**42**	**9**
09:00 – 10:00	38	71	4	4	42	75
10:00 – 11:00	25	81	4	4	29	85
11:00 – 12:00	103	38	4	4	107	42
12:00 – 13:00	102	115	4	4	106	119
13:00 – 14:00	153	85	4	4	157	89
14:00 – 15:00	90	97	4	4	94	101
15:00 – 16:00	91	97	4	4	95	101
16:00 – 17:00	153	130	4	4	157	134
17:00 -18:00	51	94	4	4	55	98
18:00 -19:00	15	5	4	4	19	9
19:00 -20:00	38	25	4	4	42	29
20:00 – 21:00	38	71	4	4	42	75
21:00 – 22:00	50	77	4	4	54	81
22:00 – 23:00	50	88			50	88
23:00 – 00:00	11	88			11	88
TOTAL[1]	**1308**	**1311**	**68**	**68**	**1376**	**1379**

[1.] Total numbers taken from calculations. Numbers in table per hour are rounded figures

2.5.2 **Table 2.12** presents a comparison between the passenger traffic generation in the DCO TA and the RTA, which shows:

- a marginal change in the AM peak (4 vehicles); and
- an increase of 87 vehicles in the PM peak.

Table 2.12 Passenger Traffic Generation Comparison between DCO TA and RTA

Time Period	DCO TA			Revised TA		
	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
03:00 – 04:00	102	74	176	41	30	71
04:00 – 05:00	225	162	386	180	129	309
05:00 – 06:00	74	54	127	168	119	288
06:00 – 07:00	14	12	27	27	20	48
07:00 – 08:00	8	8	16	4	4	8
08:00 – 09:00	**79**	**110**	**188**	**80**	**113**	**193**
09:00 – 10:00	79	110	188	80	113	193
10:00 – 11:00	91	67	158	39	29	67
11:00 – 12:00	184	184	369	193	193	385
12:00 – 13:00	219	172	391	173	140	313
13:00 – 14:00	207	200	407	269	246	515
14:00 – 15:00	128	145	273	170	177	347
15:00 – 16:00	252	231	483	173	179	351
16:00 – 17:00	207	200	407	269	246	515
17:00 -18:00	**30**	**24**	**54**	**82**	**59**	**141**
18:00 -19:00	30	39	69	27	37	64
19:00 -20:00	79	110	188	80	113	193
20:00 – 21:00	79	110	188	80	113	193
21:00 – 22:00	79	110	188	80	113	193
22:00 – 23:00	94	129	222	100	138	238
23:00 – 00:00	0	0	0	0	0	0
TOTAL[1]	**2257**	**2250**	**4507**	**2314**	**2310**	**4624**

[1] Total numbers taken from calculations. Numbers in table per hour are rounded figures

2.5.3 **Table 2.13** presents the difference between the amended passenger traffic generation and the passenger traffic generation presented in the DCO TA and the RTA. This shows:

- a reduction in AM peak hour traffic generation of 141 vehicles compared to the revised traffic generation in the RTA; and
- a marginal increase in the PM peak hour traffic generation of 11 vehicles compared to the revised traffic generation in the RTA.

Table 2.13 Passenger Traffic Generation – Amended Passenger Traffic Generation minus DCO TA and RTA

Time Period	Updated Passenger Traffic - DCO TA			Updated Passenger Traffic - Revised TA		
	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
03:00 – 04:00	-76	-59	-135	-15	-15	-30
04:00 – 05:00	-110	-97	-207	-65	-65	-129
05:00 – 06:00	36	7	43	-59	-59	-117
06:00 – 07:00	5	0	5	-8	-8	-16
07:00 – 08:00	-4	-4	-8	0	0	0
08:00 – 09:00	**-37**	**-100**	**-137**	**-38**	**-103**	**-141**
09:00 – 10:00	-37	-35	-72	-38	-38	-76
10:00 – 11:00	-62	18	-44	-10	56	46
11:00 – 12:00	-77	-142	-219	-85	-151	-236
12:00 – 13:00	-113	-54	-166	-67	-21	-88
13:00 – 14:00	-50	-112	-162	-112	-157	-269
14:00 – 15:00	-34	-44	-79	-76	-76	-153
15:00 – 16:00	-156	-130	-286	-77	-77	-155
16:00 – 17:00	-50	-66	-116	-112	-112	-224
17:00 -18:00	**25**	**73**	**98**	**-27**	**38**	**11**
18:00 -19:00	-10	-30	-40	-8	-28	-36
19:00 -20:00	-37	-80	-117	-38	-83	-121
20:00 – 21:00	-37	-35	-72	-38	-38	-76
21:00 – 22:00	-25	-29	-54	-26	-32	-58
22:00 – 23:00	-44	-40	-84	-50	-50	-100
23:00 – 00:00	11	88	100	11	88	100
TOTAL[1]	**-880**	**-871**	**-1752**	**-937**	**-931**	**-1869**

1. Total numbers taken from calculations. Numbers in table per hour are rounded figures

2.5.4 The overestimation of the AM peak hour traffic is comparable to the traffic generation for departure and arrival flights which would affect the AM peak hour. On this basis, the DCO TA has been robust and has assessed a situation equivalent to departure/arrival flights affecting the AM peak hour.

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Appendix ISH7 – 32

Technical note:
Manston Airport DCO
Wider Study Area – Proportional Impact Assessment

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.

1.1.1 A Transport Assessment (TA) [APP-060, 061] was submitted in support of the DCO application. This was based on a spreadsheet model of traffic flows derived from traffic count surveys and the future year when the Proposed Development is expected to be fully operational. In addition to the existing 2017 baseline, two future year scenarios were tested:

- Scenario 1 – 2039 Baseline (with background traffic growth which took account of the draft Thanet Local Plan residential and employment growth); and
- Scenario 2 – 2039 Baseline + Proposed Development traffic.

1.1.2 The study area was scoped with highways officers in Kent County Council (KCC), and comprises key junctions in the Thanet district. Through the Examination process, KCC has commented on whether a wider study area needs to be considered – along the A299 and A256.

1.1.3 The purpose of this technical note is to undertake a proportional impact assessment of development traffic flows at junctions on the A299 and A256 outside of Thanet District.

1.2 Format of Technical Note

1.2.1 The Technical Note includes the following:

- Chapter 2: Proportional Impact Assessment
- Chapter 3: Conclusions.

2. Proportional Impact Assessment

2.1 Introduction

2.1.1 There are no current national guidelines on transport assessment, however a standard, acceptable approach to traffic impact assessment based on now superseded guidance documents comprises two steps:

- Step 1 – identify the proportional increase in vehicular flows at a junction as a result of development traffic. Changes of less than 5% can be considered to be within the typical daily variation of traffic flows at any one junction and can be discounted from further assessment.
- Step 2 – undertake capacity modelling of junctions were the change is traffic flow is greater than 5%.

2.1.2 This is an approach which has been adopted in recent examples of Transport Assessments supporting planning applications in the Thanet district, and has been accepted by KCC, for example, Land at Haine Road, Westwood Cross (planning reference OL/TH/18/0261).

2.2 Proportional Impact Assessment – A256

2.2.1 Baseline traffic data has been sourced from the following planning applications and is provided in **Appendix A**:

- Discovery Park Masterplan Transport Assessment, AECOM, January 2014 – based on the 2018 base traffic + permitted development + committed + development scenario; and
- Whitfield Urban Extension Phase 2 Transport Assessment, RPS, December 2016 – based on the 2015 base traffic flow scenario.

2.2.2 This provided traffic data for the following junctions:

1. A256/Ramsgate Road
2. A256/Monk's Way
3. A256/Ash Road/A57
4. A256/Deal Road
5. A256/New Rbt
6. A256/A2 (north+south)
7. Whitfield Roundabout

2.2.3 The following growth factors were applied to the baseline traffic:

- 2018 to 2039 – AM Peak – Total Vehicles 1.1822 – HGVs 1.2418
- 2018 to 2039 – PM Peak – Total Vehicles 1.1882 – HGV – 1.2481
- 2018 to 2039 – AM Peak – Total Vehicles 1.21625 – HGVs 1.3037
- 2018 to 2039 – PM Peak – Total Vehicles 1.2221 – HGV – 1.2099

2.2.4 A proportional impact assessment of the development traffic at the seven junctions was undertaken and the results are set out in **Table 2.2**. The development traffic flows are those based on the revised traffic generation agreed with KCC after the DCO submission and included in the Revised TA submitted at Deadline 5.

Table 2.1 A256 – proportional impact

	2039 Base		**2039+Dev**		**% Impact**	
	AM	**PM**	**AM**	**PM**	**AM**	**PM**
A256/Ramsgate Road	3910	3544	4055	3701	3.58%	4.25%
A256/Monk's Way	4121	3853	4250	3968	3.05%	2.90%
A256/Ash Road/A57	4077	4100	4206	4242	3.08%	3.34%
A256/Deal Road	3538	2893	3649	3016	3.04%	4.08%
A256/New Rbt	1794	1505	1848	1572	2.93%	4.23%
A256/A2 (north+south)	3464	2940	3531	3049	1.90%	3.58%
Whitfield Roundabout	4434	4231	4479	4288	1.00%	1.33%

2.2.5 The findings show that the development traffic results in proportional increases of less than 5% at each of the junctions in the AM and PM peaks, and is therefore it is appropriate to discount these junctions as requiring further assessment.

2.3 Proportional Impact Assessment – A299

2.3.1 The majority of traffic flows routeing west on the A299 are travelling towards the M2 and London and do not divert off the strategic route. There are no at grade junctions between Junction 7 (A299/A28) and J2 M2 (Brenley Corner). Therefore, the DCO TA and RTA consider the extent of the network along the A299. An assessment has been undertaken of Brenley Corner by both the Applicant (submitted as Appendix Tr.3.36 at Deadline 7a) and Highways England and found that the development traffic does not have a material impact on the merge/diverge lanes at the junction.

3. Conclusions

3.1.1 Extending the study area along the A256 or the A299 has been demonstrated to be not a requirement as the development traffic flows are less than 5% which is within the accepted variance for daily traffic flows.

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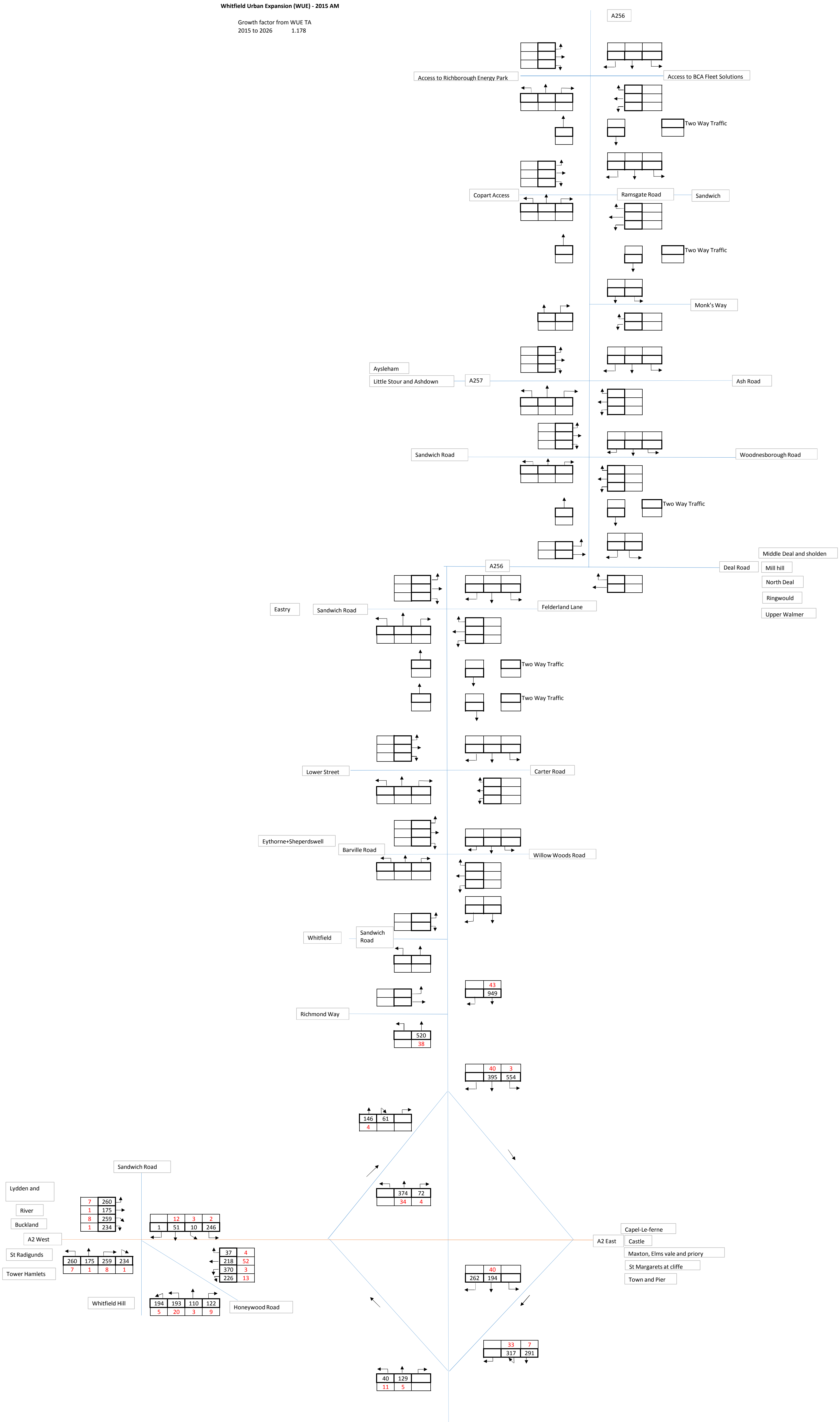
Appendix A
Traffic Flows

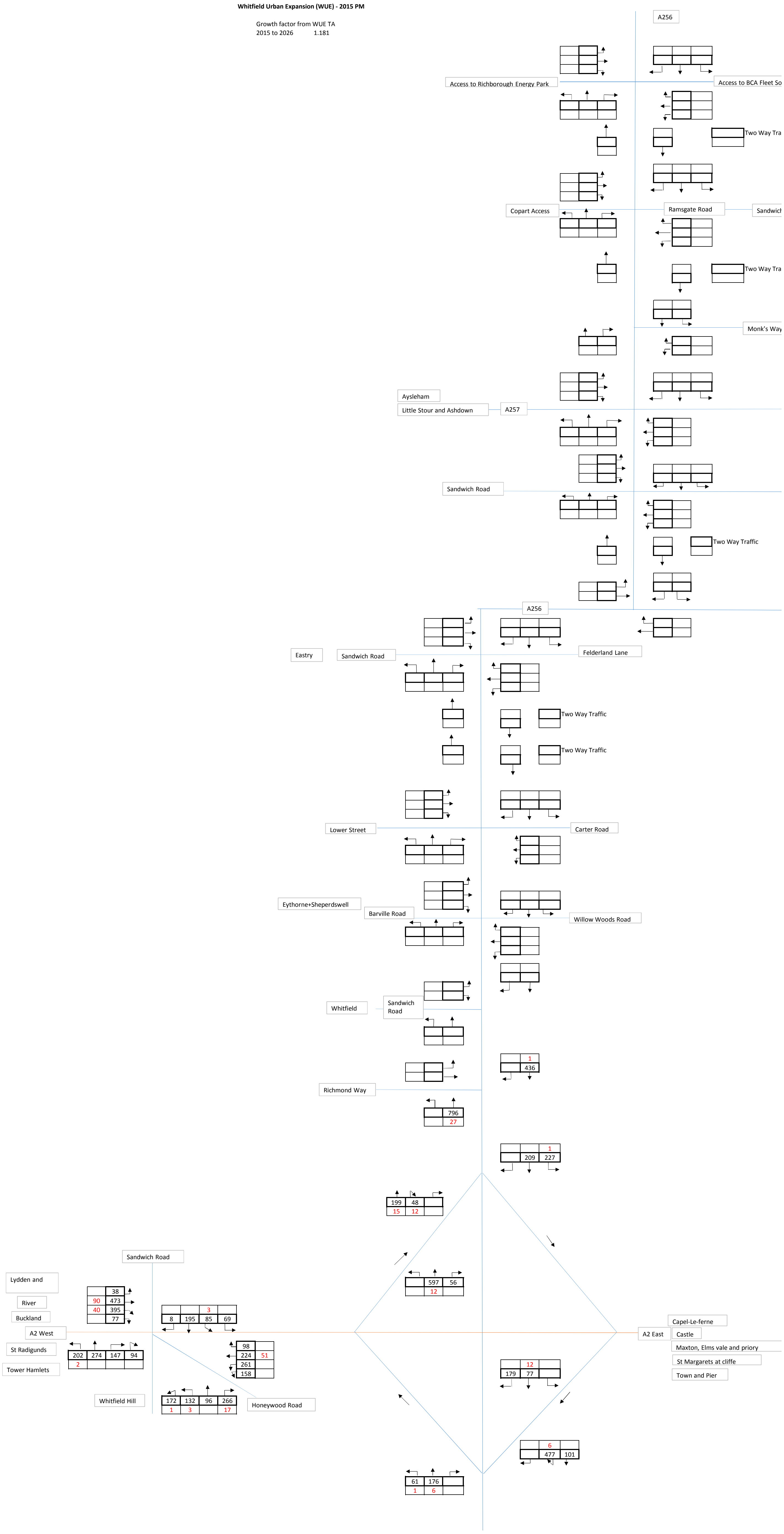
Whitfield Urban Expansion (WUE) - 2015 AM

Growth factor from WUE TA
2015 to 2026 1.178

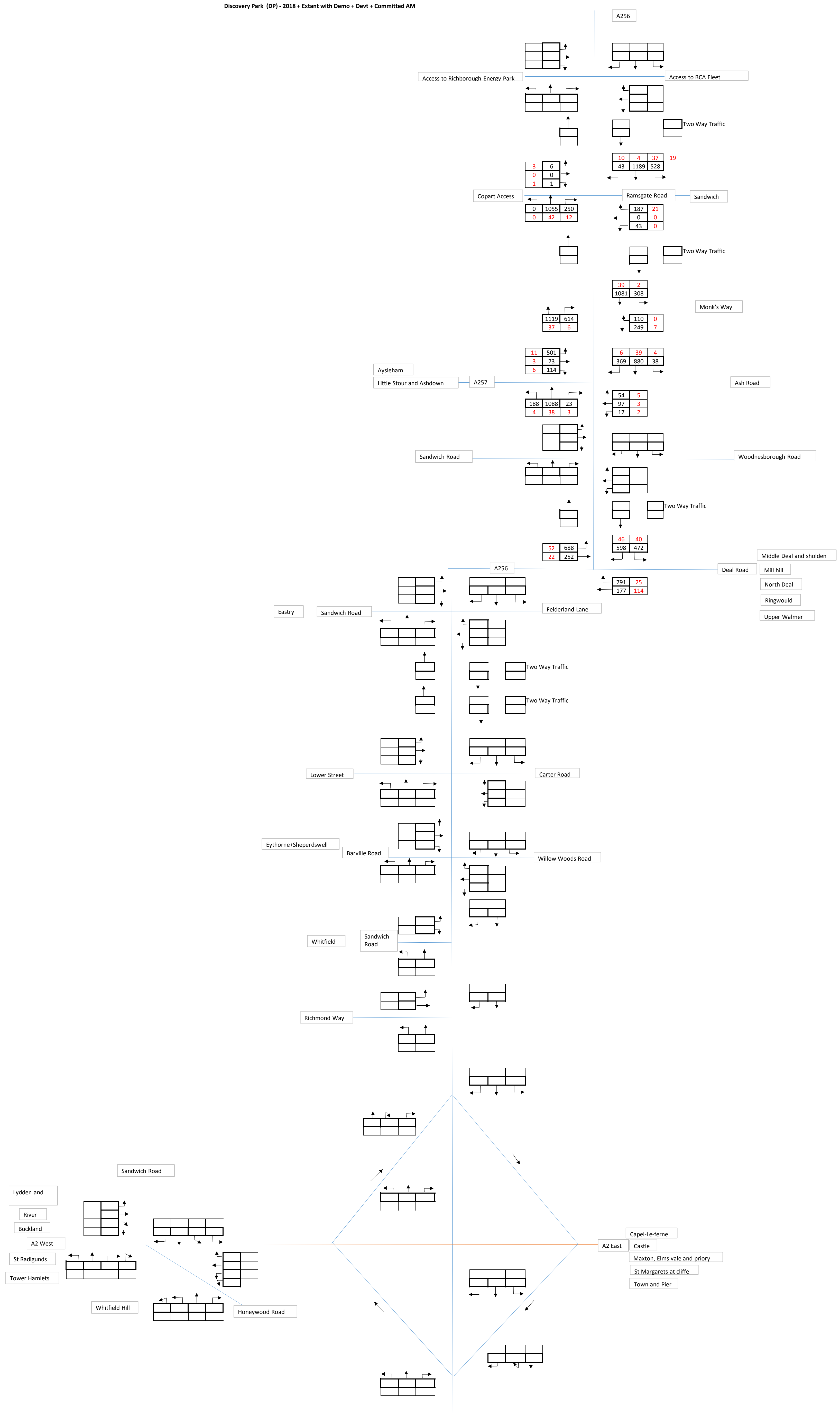


Whitfield Urban Expansion (WUE) - 2015 PM

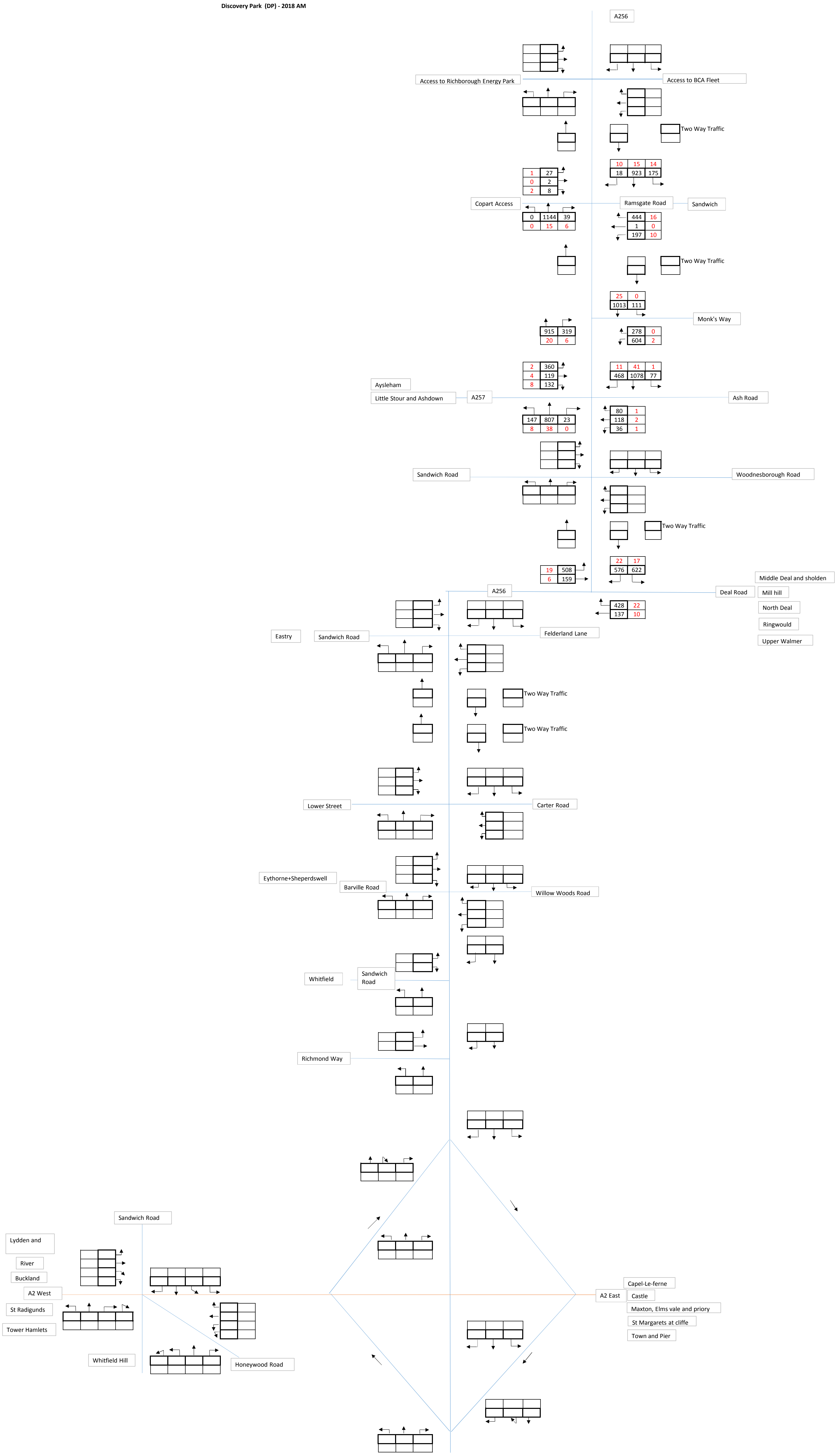
Growth factor from WUE TA
2015 to 2026 1.181



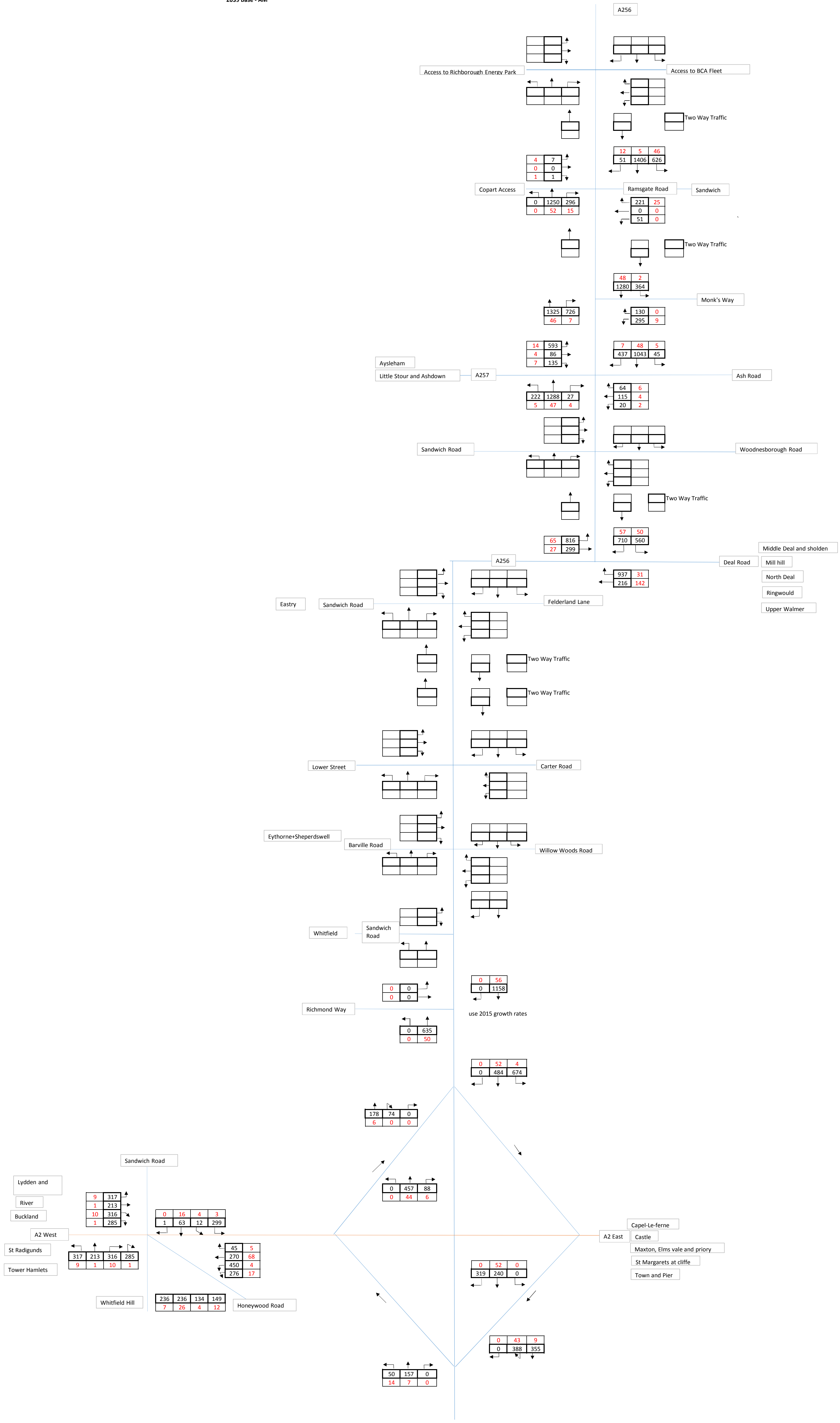
Discovery Park (DP) - 2018 + Extant with Demo + Devt + Committed AM



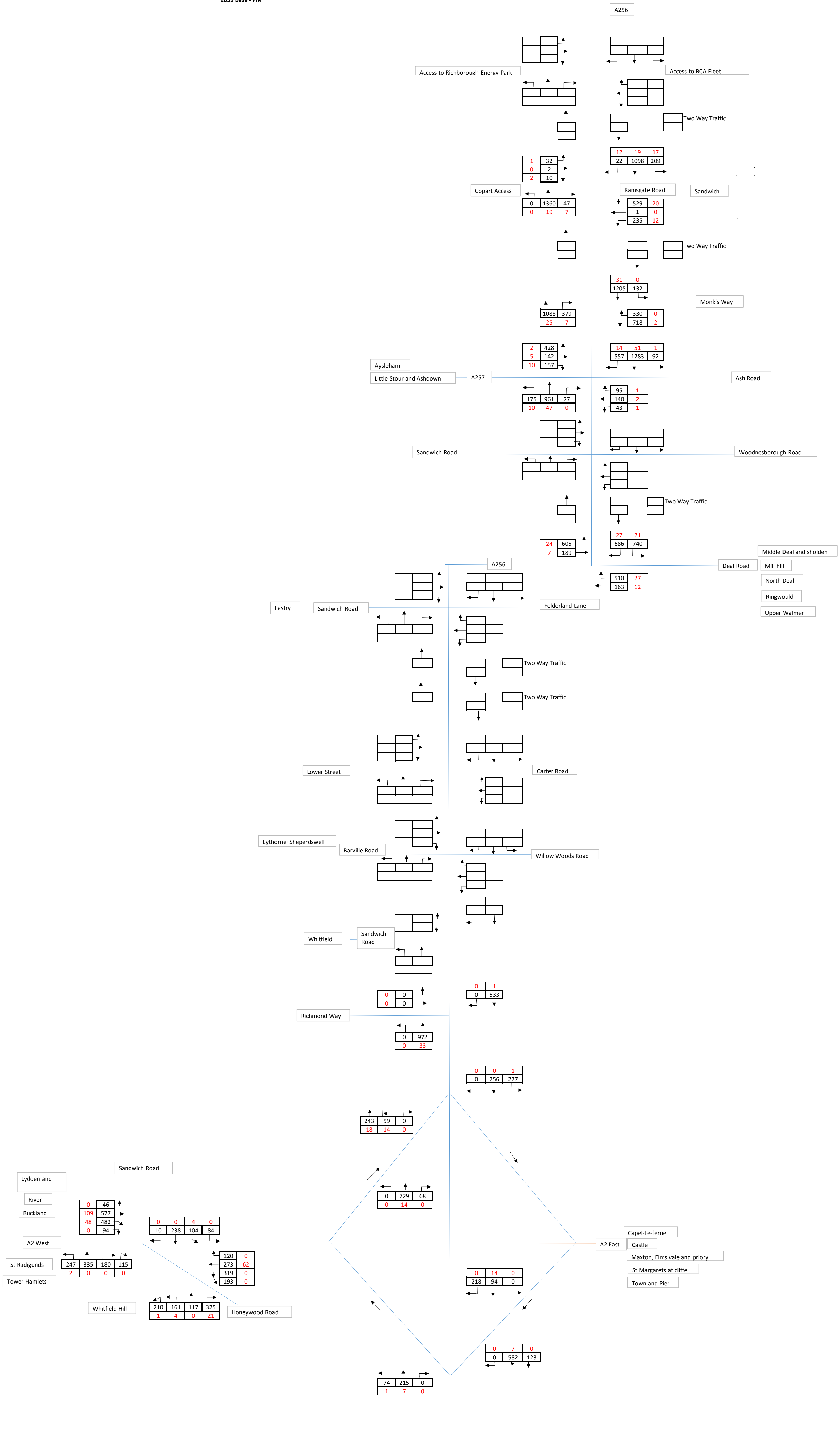
Discovery Park (DP) - 2018 AM



2039 Base - AM


A256
Access to Richborough Energy Park
Access to BCA Fleet
Two Way Traffic
Copart Access
Ramsgate Road
Sandwich
Two Way Traffic
Monk's Way
Aysleham
Little Stour and Ashdown
A257
Ash Road
Sandwich Road
Woodnesborough Road
Two Way Traffic
A256
Deal Road
Middle Deal and sholden
Mill hill
North Deal
Ringwould
Upper Walmer
Eastry
Sandwich Road
Felderland Lane
Two Way Traffic
Two Way Traffic
Lower Street
Carter Road
Eythorne+Sheperdswell
Barville Road
Willow Woods Road
Whitfield
Sandwich Road
Richmond Way
use 2015 growth rates
Sandwich Road
Lydden and
River
Buckland
A2 West
St Radigunds
Tower Hamlets
Whitfield Hill
Honeywood Road
A2 East
Capel-Le-ferne
Castle
Maxton, Elms vale and priory
St Margarets at cliffe
Town and Pier

2039 Base - PM



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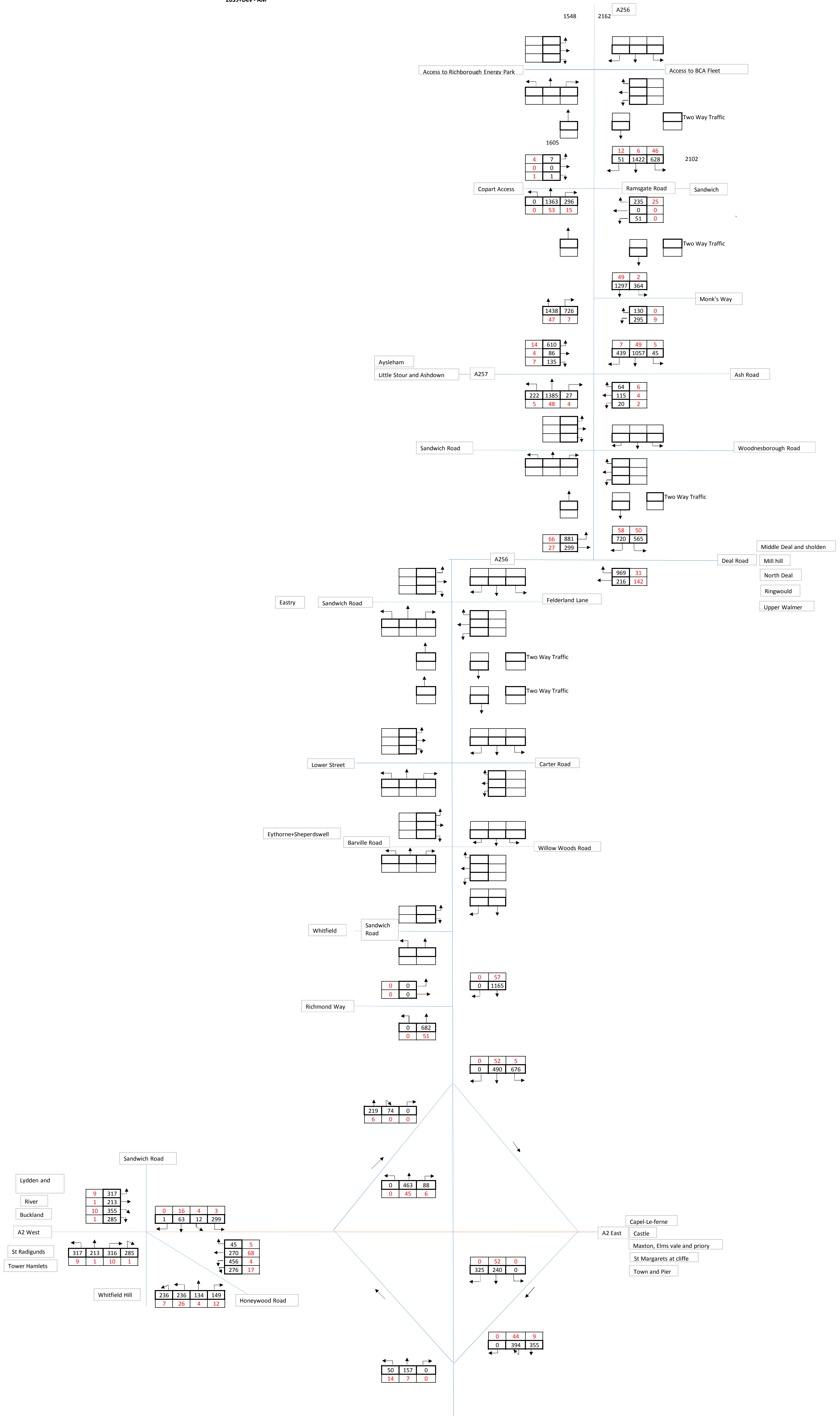
2039+Dev - AM



A256
1548
2162
Access to Richborough Energy Park
Access to BCA Fleet
Two Way Traffic
1605
2102
Copart Access
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Sandwich
Two Way Traffic
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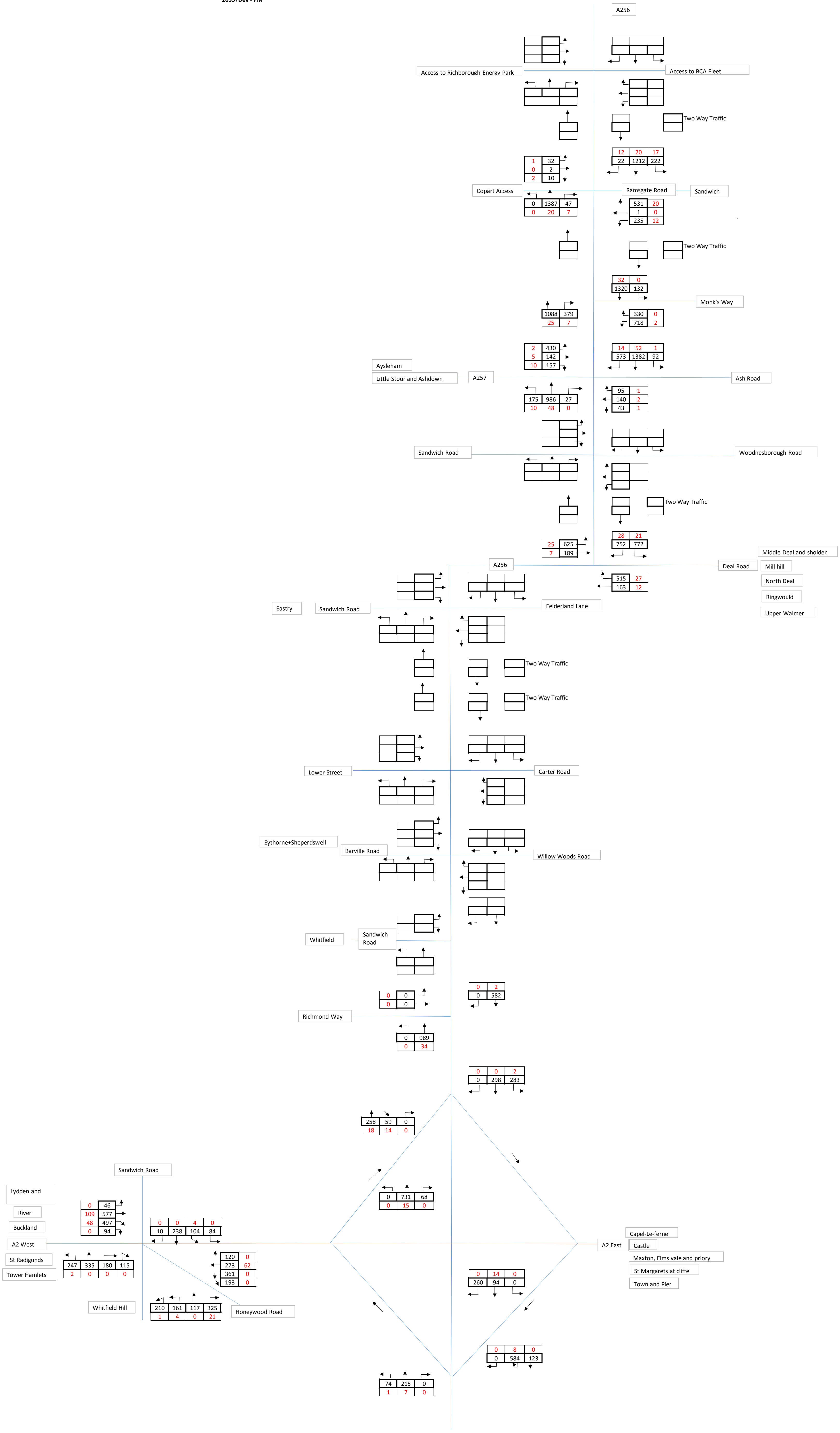

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Appendix ISH7 – 36

Appendix ISH 7 – ExA Action 36

Explanatory Note of the Safety and Security Issues with the Manston Haine Link Road Transecting the Northern Grass Area

1.1 The Northern Grass area will comprise a Business Park consisting of B1 and B8 units accommodating airport-related businesses which do not require an airside location but are critical to the running of the airport.

1.2 The constraints to the construction of the Manston Haine Link through the Northern Grass Area relate to:

- Road safety and traffic delay; and
- Security.

Road Safety and Delay

1.3 There will be interaction between the businesses which will result in the intra-movement of freight transported by HGVs and other vehicles and there is a need for flexibility as to the exact configuration of the Business Park in order to facilitate this site intra-movement. The Manston Haine Link alignment as proposed by Kent County Council (KCC) will inhibit this flexibility and as a consequence, may result in a significant number of intra-movements across a public highway which would lead to road safety risks and delays to the throughput of traffic, as well as delays to the operations of the businesses.

Security

1.4 There are further issues with respect to security:

1.5 The KCC route will also result in a traffic management tariff for the airport security staff/system as it will bring all traffic, airport related & unrelated almost to the centre of combined support and operational areas.

1.6 The Airport will not be able to implement any security measures at the access point into and out of the Business Park if this is a public highway.

1.7 Finally, the Applicant has been advised that the CAA are likely to view a 'rotary' system around the airport perimeter, and the airport's associated industrial / support areas (albeit outside the operational zone), as an advantage in that HGVs etc are not directly pointing at the primary security fence. Any deviation from a perimeter/circumference routing outside a security fence becomes obvious. Furthermore, the CAA are likely to demand 'bunding' or heavy duty security bollards to the south of the 'T-junction' formed at the end of the current road.

Appendix ISH7 – 38

Appendix ISH 7 – ExA Action 38

Explanatory Note addressing the implications of safeguarding a wider corridor for the proposed Manston-Haine link road

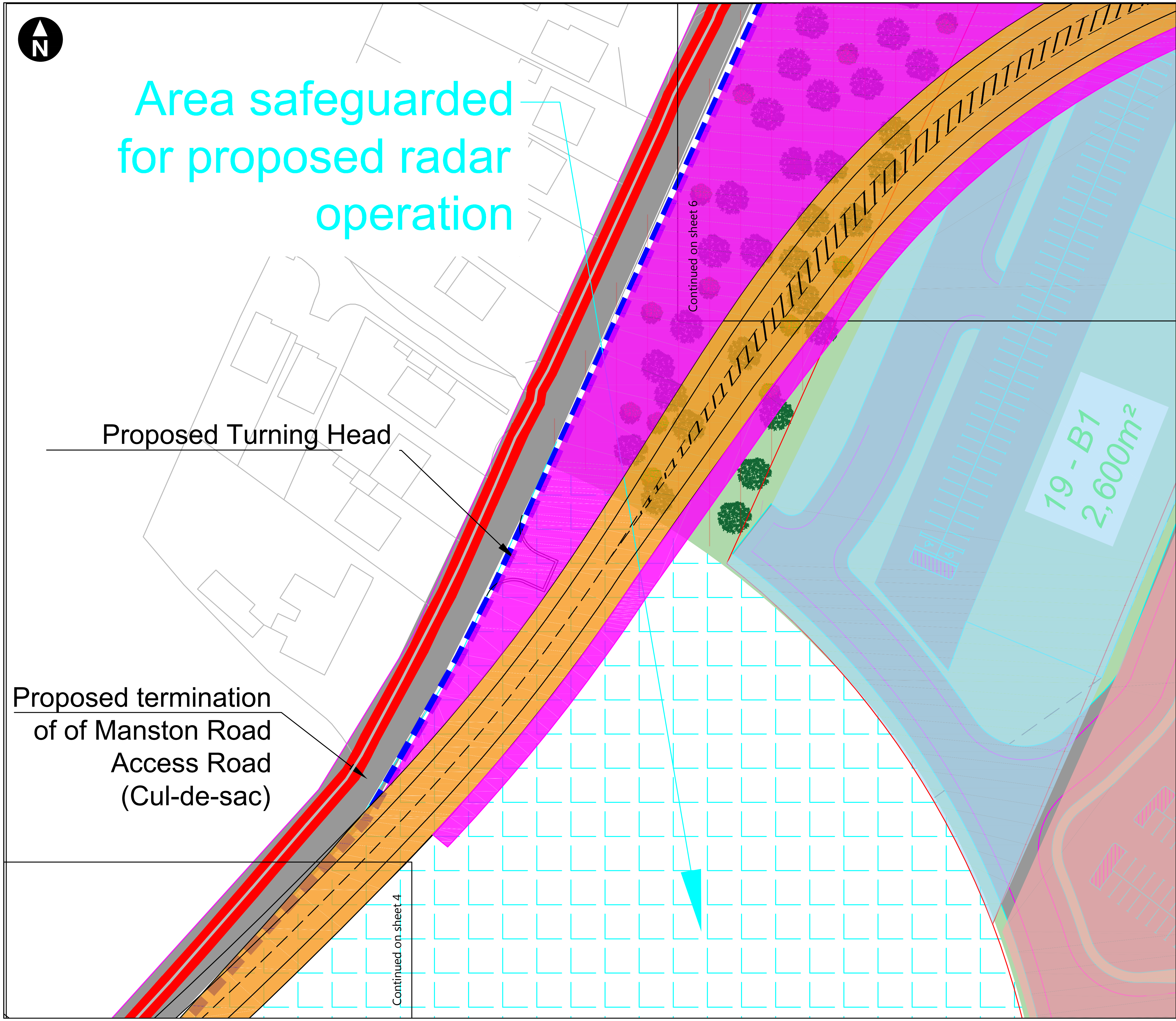
1.1 The proposed location of the Manston-Haine link does not have adverse effects with respect to aviation safety, in regard to Air Traffic Services (ATS) provision through the use of the radar. Where the proposed route, and its wider corridor, diverts into the radar safeguarding area (sterile zone which lies above the ground level), the dish will be approximately 27m above ground level and well above the route; hence all road traffic, and the route's furniture will be well below the safeguarding surface (forming a ceiling) of the radar dish. Therefore, although inside the safeguarded radius of the surface, the route would have no impact on radar performance.

1.1.1 The intention of the sterile circle is to prevent tall building construction which would result in degradation of radar performance.

1.1.2 Limited development underneath this sterile zone can be tolerated

1.1.3 This ensures that the beam is unaffected or blocked by obstacles, permanent, temporary or transitional, to permitting clean, un-interrupted radar beam formation

1.2 Having a wider corridor also means that heritage impacts are more likely to be able to be avoided.



Key

- Red Line Boundary
- Existing based on Ordnance Survey map
- Proposed kerbline
- Proposed Road Marking
- Proposed Footway
- Intervisibility area
- Highway boundary
- Manston - Haine Link Land for safeguarding

0 m 40 m

Scale 1:750 @ A3

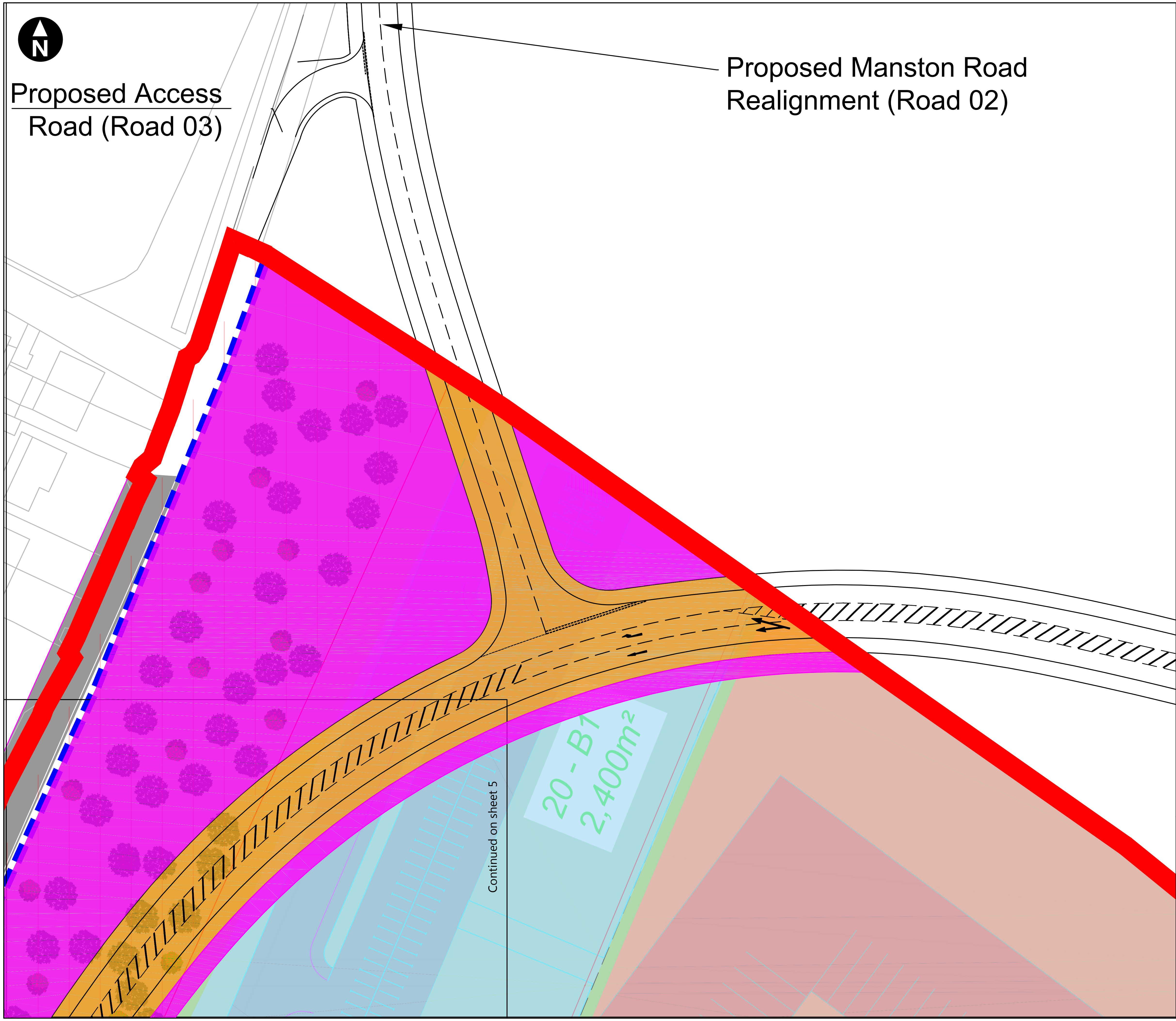
Manston Airport DCO

Manston - Haine Link
Land for Safeguarding
Sheet 5

June 2019

wood.

R:\Projects\40820 STH Manston Airport Post Application\D Design\Drawings\AutoCAD\Masterplan with junction NK018417-RPS-MSE-XX-DR-C-2000.dwg Originator: TRISTAN.STEPHENS



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0 m 40 m

Scale 1:750 @ A3

Manston Airport DCO

Manston - Haine Link
Land for Safeguarding
Sheet 6

June 2019

wood.

Appendix ISH7 – 42

Technical note:
Estimation of Off-Site Junction Mitigation Costs and Trigger Points

1. Introduction

1.1.1 The Transport Assessment submitted in support of the DCO identified a number of improvement schemes to mitigate the impact of the development traffic at junctions on the local road network. These are summarised in **Table 1.1**.

Table 1.1 Junction Improvement Schemes

Junction	Summary of Mitigation Scheme
Junction 1 (A256/Sandwich Road)	Minor widening on Arms
Junction 2 (A299 / A256 / Cottington Link Road)	Signalisation of Roundabout
Junction 4 (A299 / B2190)	Signalisation of Roundabout
Junction 6 (A299 / Seamark Road / A253 / Willetts Hill)	Signalisation of Roundabout
Junction 7 (A299 / A28)	New Advanced Signs and Whitelining
Junction 10 (Shottendane Rd / Manston Road / Margate Hill)	Minor widening and white lining
Junction 13 (Manston Court Road / B2050 Manston Road)	Provision of a new three arm signalised junction with pedestrian crossing facilities linked to the signalised junction proposals for the main airport terminal access
Junction 15 (Manston Rd / Hartsdown Rd / Tivoli Rd / College Rd / Nash Rd)	Provision of new signal head locations, road markings and revised stage sequence operation
Junction 16 (Ramsgate Rd / College Rd / A254 / Beatrice Rd)	Provision of new stop line, road markings, signal head locations and revised stage sequence operation.
Junction 17 (Ramsgate Road / Poorhole Lane / Margate Road / Star Lane)	New Signal Arrangement/Whitelining

1.1.2 It should be noted that the following schemes have been taken out:

- Junction 21 – this is not required due to the committed junction scheme as part of the Manston Green development
- Junctions 26 and 27 - A Stage 1 RSA identified problems and recommendations at the two junctions which could not be resolved. Further consideration has been given to the constraints to improvement at the junction and the volume of development traffic at both the junctions, which is 45 vehicles in the AM peak and 36 vehicles in the PM peak hour. It has been concluded that there is limited opportunity to improve the junction and the scale of development traffic does not result in a severe impact. These schemes are therefore no longer being taken forward.

1.1.3 This Technical Note sets out the indicative costs for the off-site mitigation that has been identified through the Transport Assessment process. The technical note provides a summary of the following:

- Off-site junction mitigation cost estimates
- Indicative thresholds for triggering the need for mitigation

1.2 Off-site junction mitigation cost estimates

1.2.1 An estimate of off-site mitigation costs has been undertaken based on measurements from the mitigation drawings and construction cost rates from SPONS.

1.2.2 Preliminaries and additional traffic management are set at 35% and a proportionate level of optimism bias has been applied given the to the level of scheme design, set at 44%.

1.2.3 The junction scheme costings and Capex Summary is provided in **Appendix 1**.

1.2.4 It is noted that the scheme designs are *not yet fully detailed, and that the designs will need to be further developed, revised and refined during the detailed design phase*.

1.2.5 The following exclusions have been applied.

- No allowance has been included for Compulsory Purchase Orders
- No allowance has been included for 3rd party land acquisition costs, including Dedication of Land or accommodation works
- No allowance has been included for major earthworks or levels of high contamination/specialist treatment
- No allowance has been included to improve existing road specification / structures
- No allowance has been included for statutory undertakers diversion/ protection and associated design costs
- No allowance has been included for drainage including associated connections/approvals
- No allowance has been included for legal costs
- No allowance has been included for VAT
- No allowance has been included for resurfacing or carriageway repair or improvement works
- No allowance has been included for any potential costs in relation to environmental issues, habitat or sites of special scientific interest
- No allowance has been included for ground investigation
- No allowance has been included for Traffic Regulation Orders (TRO) and any associated TRO consultation
- No allowance has been included for contract administration and project management
- No allowance has been included for upgrades to existing sewerage system (drainage assumed connected to existing system)
- No allowance has been included for any structures (retaining walls, culverts etc.)
- No allowance has been included for new or improved levels of street lighting

1.3 Timing of Off-site Mitigation Works

1.3.1 In determining the timing of mitigation schemes, consideration is given to the operational performance of a junction and the scale of impact of a development which may trigger queuing or a severe impact at a junction already at capacity. In order to try and identify this for each of the junctions reference has been made to the following:

- The 2017 and 2039 baseline junction modelling included in the original Transport Assessment (TA) which was submitted in support of the DCO, and the revised TA which was based on the outputs from the Thanet Strategic Transport Model (TSTM) which incorporated the Thanet Transport Strategy (TTS). This modelling work shows whether the junctions are operating with capacity or have capacity and queuing issues.
- Baseline traffic flows at each of the junctions based on the 2017 counts and the TSTM outputs. This provides baseline data for 2017, 2031 (from the TSTM) and 2039 (two sets – one growthed from the traffic counts, as presented in the TA, and one growthed from the TSTM outputs, presented in the revised TA).
- Development traffic levels at each junction over different stages of the development construction and operation, up to Year 20 when the Airport is expected to be fully operational. Consideration has been given to Years 2, 5, 10, 15 and 20.
- The proportional impact of the development traffic at the junction for the years 2031 and 2039.

1.3.2 These are presented in **Appendix 2** and show that a number of the junctions are currently performing at capacity but queues are relatively short. In the 2039 situation, based on the TSTM outputs, most junctions are at capacity with queuing issues. Based on the growthed traffic counts, all junctions have capacity issues. It can be seen that the development flows at a number of junctions are very modest with low proportional impacts.

1.3.3 In the absence of junction models in the interim years between 2017 and 2039, consideration has been given the quantum of development traffic at a junction and its proportional increase on baseline traffic in order to identify trigger points for the mitigation schemes.

1.3.4 A consistent approach has been identified, based on a development impact of more than 100 vehicles at each junction, either in the AM or PM peak hour. This is shown in the table in Appendix 2. It is intended that this will be discussed with KCC and an appropriate threshold identified.

Issued by

[redacted]

Approved by

[redacted]

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Appendix 1

Summary of Junction Costings

PROJECT: 40820 Manston
Wood: Junctions Capex Summaries

Junction	Construction Cost Sub-Total	Project-on Costs	CAPEX Total Cost (Ex VAT)	CAPEX Total Cost, EST Lower Limit (-15%)	CAPEX Total Cost,EST Upper Limit (+30%)
Junction 1 (A256/Sandwich Road)	£45,965	£16,547	£91,010	£77,000	£118,000
Junction 2 (A299 / A256 / Cottington Link Road)	£422,484	£152,094	£836,519.07	£711,000	£1,087,000
Junction 4 (A299 / B2190)	£417,596	£150,335	£826,840.67	£703,000	£1,075,000
Junction 6 (A299 / Seamark Road / A253 / Willetts Hill)	£417,596	£150,335	£826,840.67	£703,000	£1,075,000
Junction 7 (A299 / A28)	£81,786	£29,443	£161,937	£138,000	£211,000
Junction 10 (Shottendane Rd / Manston Road / Margate Hill)	£35,913	£12,929	£71,107	£60,000	£92,000
Junction 13 (Manston Court Road / B2050 Manston Road)	£298,146	£107,333	£590,329	£502,000	£767,000
Junction 15 (Manston Rd / Hartsdown Rd / Tivoli Rd / College Rd / Nash Rd)	£25,481	£9,173	£50,452	£43,000	£66,000
Junction 16 (Ramsgate Rd / College Rd / A254 / Beatrice Rd)	£209,936	£75,577	£415,673	£353,000	£540,000
Junction 17 (Ramsgate Road / Poorhole Lane / Margate Road / Star Lane)	£26,944	£9,700	£53,349	£45,000	£69,000
Total	**£1,981,847**	**£713,466**	**£3,924,057**	**£3,335,000**	**£5,100,000**

Please note that the scheme design is not yet fully detailed, and that the design will need to be further developed, revised and refined during the detailed design phase. Please also note that any quantities or costs shown or included from the concept/preliminary pre-tender design should be treated as indicative only.

Exclusions:
No allowance has been included for Compulsory Purchase Orders
No allowance has been included for 3rd party land acquisition costs, including Dedication of Land or accommodation works
No allowance has been included for major earthworks or levels of high contamination/specialist treatment
No allowance has been included to improve existing road specification/structures
No allowance has been included for statutory undertakers diversion/protection work or associated design costs
No allowance has been included for drainage including associated connections/approvals
No allowance has been included for VAT
No allowance has been included for resurfacing or carriageway repair or improvement works
No allowance has been included for any potential costs in relation to environmental issues, habitat or sites of special scientific interest
No allowance has been included for Traffic Regulation Orders (TRO) and any associated TRO consultation
No allowance has been included for upgrades to existing sewerage system (drainage assumed connected to existing system)
No allowance has been included for any structures (retaining walls, culverts etc.)
No allowance has been included for new or improved levels of street lighting

PROJECT: 40820 Manston
Wood: Junction 1

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CAPEX ESTIMATE GRAND SUMMARY

SERIES	DESCRIPTION		Junction 1	
			35%	
100	Preliminaries, including restricted working hours			£11,916.81
200	Site Clearance			£3,647
600	Earthworks			£2,148
700	Pavements			£19,822
1100	Kerbs, Footways and Paved Areas			£6,510
1200	Traffic Signs and Road Markings			£1,921
	Construction Cost Sub-Total		**£45,965**	
	Project On-Costs	36.0%	**£16,547**	
	Site Investigation	6.0%		£2,758
	Concept Design	3.0%		£1,379
	Design & Planning	5.0%		£2,298
	Publicity	6.0%		£2,758
	Compensation	0.0%		£0
	Legal	7.0%		£3,218
	CDM (now included in design)	2.0%		£919
	Site Supervision	3.0%		£1,379
	Project Management	2.0%		£919
	Risk - General	2.0%		£919
	Scheme Optimism Bias	44.0%	**£20,225**	
	CAPEX SUB-TOTAL		**£82,737**	
	CONTINGENCY	10%	**£8,273.67**	
CAPEX TOTAL (EXCLUDING VAT)			**£91,010**	
EST. ACCURACY LOWER LIMIT	-	**15%**	**£77,000**	
EST. ACCURACY UPPER LIMIT	+	**30%**	**£118,000**	

Title:	**Wood: Junction 1**
Drawing:	38199-Lon338 R:\Projects\38199 Manston Airport DCO EIA\4 Design\AutoCAD
	Based on estimated sizing
Notes:	**Cost estimate excludes the following:** **1)** New Drainage, or diversion of existing **2)** Street lighting, illuminated signage, road signage **3)** Third party land costs **4)** No new or relocation of statutory utilities **5)** Landscaping

Base Date Spons 2018	2Q17	317
Current	3Q2018	315
Spons 2018 update		0.99
Location Factor	BCIS	1.15

Estimate Base Date	4Q19	329
Inflation Adjustment		1.04

Indicative Highway Engineering cost

Series	Item Description	Assumptions	Quantity	Unit	Rate	Rate (+uplift)	Price	Comment
200	Series 200 - Site Clearance							
200	Site Clearance	General Site Clearance - Open Field Site	1	ha	£1,923.92	£2,296.26	£2,296	Spon's 2018 Pg. 385
200	Kerb removal	Take up or take down & set aside for re-use/tip	126	m	£4.94	£5.90	£743	Spon's 2018 Pg. 386
200	Allowance for unmeasured items		20%	%	£3,039.17		£608	N/A
600	Series 600 - Earthworks							
600	Excavation for new carriageway	General excavation of acceptable Class 5A material. Excavate 550mm	27	m3	£3.76	£4.52	£122	Spon's 2018, pg. 409
600	Excavation for new footway	General excavation of acceptable Class 5A material. Excavate 210mm	2	m3	£3.76	£4.52	£7	Spon's 2018, pg. 409
600	Excavation for new verge	General excavation of acceptable Class 5A material. Excavate 150mm	-	m3	£3.76	£4.52	£0	Spon's 2018, pg. 409
600	Disposal off site of excavated material	Disposal of acceptable material Class 5A. Using 10t Capacity lorry; haul distance for 1km = £4.34. £2.17 per further Km haul. Assumed 10km haul distance.	51	m3	£27.12	£32.57	£1,661	Spon's 2018, pg. 411
600	Top soiling	Top soilling 150mm thick to surface		m2	£7.17	£8.61	£0	Spon's 2017, pg. 418
600	Allowance for unmeasured items		20%	%	£1,789.99		£358	N/A
700	Series 700 - Pavements							
700	Cold Milling	50mm deep; scarifying surface	271	m2	£19.77	£23.75	£6,435	Spon's 2018, pg. 431
700	Sub-Base	Granular Material DfT Type 1 - Sub-base in carriageway - 200mm	27	m3	£39.70	£47.68	£1,287	Spon's 2018, pg. 427
700	Base	Dense Bitumen Macadam - Base to DfT Clause 903 - 200mm	49	m2	£34.34	£41.25	£2,021	Spon's 2018, pg. 428
700	Binder Course	Dense Bitumen Macadam - Binder Course to DfT Clause 904 - 100mm	49	m2	£19.76	£23.73	£1,163	Spon's 2018, pg. 428
700	Surface Course	Dense Bitumen Macadam - Surface Course to DfT Clause 909 - 50mm	320	m2	£14.60	£17.54	£5,612	Spon's 2018, pg. 428
700	Allowance for unmeasured items		20%	%	£16,518.24		£3,304	N/A
1100	Series 1100 - Kerbs, Footways and paved areas							
1100	Foundations to kerbs	300x150mm - Mass concrete	151	m	£5.90	£7.09	£1,070	Spon's 2018, pg. 433
1100	Kerbs	150x305mm - Straight or curved exceeding 12m radius	151	m	£23.82	£28.61	£4,320	Spon's 2017, pg. 433
1100	Edge Kerbs	150x50mm - Straight or curved exceeding 12m radius	-	m	£6.24	£7.49	£0	Spon's 2017, pg. 433
1100	Drop kerbs	150mm x 305mm kerb - incl pedestrian island drop kerb	-	m	£30.20	£36.27	£0	Spon's 2017, pg. 433
1100	Footway Sub-base	150mm - Thick hardcore	1	m2	£5.71	£6.86	£7	Spon's 2017, pg. 436
1100	Footway - Paved Area	Bitumen macadam surfacing. 40mm binder course + 20mm surface course	1	m2	£23.22	£27.89	£28	Spon's 2017, pg. 437
1100	Allowance for unmeasured items		20%	%	£5,425.00		£1,085	N/A
1200	Series 1200 - Traffic Signs/Road Markings							
1200	Give Way	200m wide with 0.6m line and 0.3m gap	45	m	£1.71	£2.05	£92	Spon's 2018, pg. 443
1200	8m long double headed arrow		-	nr	£73.43	£88.20	£0	Spon's 2018, pg.443
1200	4m long straight or turning arrow		-	nr	£28.94	£34.76	£0	Spon's 2018, pg.443
1200	Triangles in reflectorized white	3.75m high	-	nr	£18.32	£22.00	£0	Spon's 2018, pg.443
1200	Ancillary line in reflectorized white	200mm in hatched areas	-	m	£1.71	£2.05	£0	Spon's 2018, pg.443
1200	Intermittent line in reflectorised white	100mm wide	120	m	£0.99	£1.19	£143	Spon's 2018, pg.443
1200	Continuous line in reflectorized white	150mm wide	-	m	£1.48	£1.78	£0	Spon's 2018, pg.443
	100mmx100mm square bi directional reflecting road stud with amber corner reflectors			nr	£8.87	£10.65	£0	Spon's 2018, pg. 444
	Surface markings; reflectorised white	letters or numerals; 1.6m high	133	nr	£8.55	£10.27	£1,366	Spon's 2018, pg. 319
1200	Allowance for unmeasured items		20%	%	£1,600.96		£320	N/A
					SUB TOTAL		£34,048	
		CONTINGENCY					£0.00	
					Overall Total		£34,048	

PROJECT: 40820 Manston
Wood: Junction 2

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Exclusions:
No allowance has been included for Compulsory Purchase Orders

No allowance has been included for 3rd party land acquisition costs, including Dedication of Land or accommodation works

No allowance has been included for major earthworks or levels of high contamination/specialist treatment
No allowance has been included to improve existing road specification/structures
No allowance has been included for statutory undertakers diversion/protection work or associated design costs
No allowance has been included for drainage including associated connections/approvals
No allowance has been included for VAT
No allowance has been included for resurfacing or carriageway repair or improvement works

No allowance has been included for any potential costs in relation to environmental issues, habitat or sites of special scientific interest

No allowance has been included for Traffic Regulation Orders (TRO) and any associated TRO consultation

No allowance has been included for upgrades to existing sewerage system (drainage assumed connected to existing system)

No allowance has been included for any structures (retaining walls, culverts etc.)
No allowance has been included for new or improved levels of street lighting

CAPEX ESTIMATE GRAND SUMMARY

SERIES	DESCRIPTION		Junction 2	
			35%	
100	Preliminaries, including restricted working hours			£109,532.99
200	Site Clearance			£7,032
600	Earthworks			£14,823
700	Pavements			£66,278
1100	Kerbs, Footways and Paved Areas			£7,382
1200	Traffic Signs and Road Markings			£217,437
	Construction Cost Sub-Total		**£422,484**	
	Project On-Costs	**36.0%**	**£152,094**	
	Site Investigation	6.0%		£25,349
	Concept Design	3.0%		£12,675
	Design & Planning	5.0%		£21,124
	Publicity	6.0%		£25,349
	Compensation	0.0%		£0
	Legal	7.0%		£29,574
	CDM (now included in design)	2.0%		£8,450
	Site Supervision (Part Time)	3.0%		£12,675
	Project Management	2.0%		£8,450
		2.0%		£8,450
	Scheme Optimism Bias	44.0%	**£185,893**	
	CAPEX SUB-TOTAL		**£760,471.88**	
	CONTINGENCY	**10%**	**£76,047.19**	
	CAPEX TOTAL (EXCLUDING VAT)		**£836,519.07**	
	EST. ACCURACY LOWER LIMIT -	**15%**	**£711,000.00**	
	EST. ACCURACY UPPER LIMIT +	**30%**	**£1,087,000.00**	

Title:	**Wood: Junction 2**
Drawing:	38199-Lon347c
	Based on estimated sizing
Notes:	**Cost estimate excludes the following:** **1)** New Drainage, or diversion of existing **2)** Street lighting, illuminated signage, road signage **3)** Third party land costs **4)** No new or relocation of statutory utilities **5)** Landscaping

Base Date Spons 2018	2Q17	317
Current	3Q2018	315
Spons 2018 update		0.99
Location Factor	BCIS	1.15

Estimate Base Date	4Q19	329
Inflation Adjustment		1.04

Indicative Highway Engineering cost

Series	Item Description	Assumptions	Quantity	Unit	Rate	Rate (+uplift)	Price	Comment
200	**Series 200 - Site Clearance**							
200	Site Clearance	General Site Clearance - Open Field Site	2	ha	£1,923.92	£2,296.26	£4,593	Spon's 2018 Pg. 385
200	Kerb removal	Take up or take down & set aside for re-use/tip	215	m	£4.94	£5.90	£1,268	Spon's 2018 Pg. 386
200	Allowance for unmeasured items		20%	%	£5,860.18		£1,172	N/A
600	**Series 600 - Earthworks**							
600	Excavation for new carriageway	General excavation of acceptable Class 5A material. Excavate 550mm	320	m3	£3.76	£4.52	£1,445	Spon's 2018, pg. 409
600	Excavation for new footway	General excavation of acceptable Class 5A material. Excavate 210mm		m3	£3.76	£4.52	£0	Spon's 2018, pg. 409
600	Excavation for new verge	General excavation of acceptable Class 5A material. Excavate 150mm	107	m3	£3.76	£4.52	£483	Spon's 2018, pg. 409
600	Disposal off site of excavated material	Disposal of acceptable material Class 5A. Using 10t Capacity lorry; haul distance for 1km = £4.34. £2.17 per further Km haul. Assumed 10km haul distance	320	m3	£27.12	£32.57	£10,424	Spon's 2018, pg. 411
600	Top soiling	Top soilling 150mm thick to surface		m2	£7.17	£8.61	£0	Spon's 2017, pg. 418
600	Allowance for unmeasured items		20%	%	£12,352.13		£2,470	N/A
700	**Series 700 - Pavements**							
700	Cold Milling	50mm deep; scarifying surface		m2	£19.77	£23.75	£0	Spon's 2018, pg. 431
700	Sub-Base	Granular Material DfT Type 1 - Sub-base in carriageway - 200mm	120	m3	£39.70	£47.68	£5,722	Spon's 2018, pg. 427
700	Base	Dense Bitumen Macadam - Base to DfT Clause 903 - 200mm	600	m2	£34.34	£41.25	£24,748	Spon's 2018, pg. 428
700	Binder Course	Dense Bitumen Macadam - Binder Course to DfT Clause 904 - 100mm	600	m2	£19.76	£23.73	£14,240	Spon's 2018, pg. 428
700	Surface Course	Dense Bitumen Macadam - Surface Course to DfT Clause 909 - 50mm	600	m2	£14.60	£17.54	£10,522	Spon's 2018, pg. 428
700	Allowance for unmeasured items		20%	%	£55,231.89		£11,046	N/A
1100	**Series 1100 - Kerbs, Footways and paved areas**							
1100	Foundations to kerbs	300x150mm - Mass concrete		m	£5.90	£7.09	£0	Spon's 2018, pg. 433
1100	Kerbs	150x305mm - Straight or curved exceeding 12m radius	215	m	£23.82	£28.61	£6,151	Spon's 2017, pg. 433
1100	Edge Kerbs	150x50mm - Straight or curved exceeding 12m radius		m	£6.24	£7.49	£0	Spon's 2017, pg. 433
1100	Drop kerbs	150mm x 305mm kerb - incl pedestrian island drop kerb		m	£30.20	£36.27	£0	Spon's 2017, pg. 433
1100	Footway Sub-base	150mm - Thick hardcore		m2	£5.71	£6.86	£0	Spon's 2017, pg. 436
1100	Footway - Paved Area	Bitumen macadam surfacing. 40mm binder course + 20mm surface course		m2	£23.22	£27.89	£0	Spon's 2017, pg. 437
	Cobble Paving	Bedding on 25mm cement mortar; filling joints; excluding subbase		m2	£51.04	£61.30	£0	Spon's 2018, pg. 317
1100	Allowance for unmeasured items		20%	%	£6,151.25		£1,230	N/A
1200	**Series 1200 - Traffic Signs/Road Markings**							
1200	Give Way	200m wide with 0.6m line and 0.3m gap	60	m	£1.71	£2.05	£123	Spon's 2018, pg. 443
1200	8m long double headed arrow			nr	£73.43	£88.20	£0	Spon's 2018, pg.443
1200	4m long straight or turning arrow			nr	£28.94	£34.76	£0	Spon's 2018, pg.443
1200	Triangles in reflectorized white	3.75m high		nr	£18.32	£22.00	£0	Spon's 2018, pg.443
1200	Ancillary line in reflectorized white	200mm in hatched areas		m	£1.71	£2.05	£0	Spon's 2018, pg.443
1200	Intermittent line in reflectorised white	100mm wide	401	m	£0.99	£1.19	£477	Spon's 2018, pg.443
1200	Continuous line in reflectorized white	150mm wide		m	£1.48	£1.78	£0	Spon's 2018, pg.443
	100mmx100mm square bi directional reflecting road stud with amber corner reflectors			nr	£8.87	£10.65	£0	Spon's 2018, pg. 444
	Traffic Signal Installation		1	nr	£150,000.00	£180,166.67	£180,167	
	traffic signs	1200mm x 400mm		nr	£62.57	£75.15	£0	Spon's 2018, pg. 317
	Relecting Road Studs	100mm x 100mm		nr	£7.17	£8.61	£0	Spons's 2018 pg, 321
	Surface markings; reflectorised white	letters or numerals; 1.6m high	76					Spon's 2018 pg. 319
	Surface markings; reflectorised white	letters or numerals; 3.75m high		nr	£22.06	£26.50	£0	Spon's 2018, pg. 319
	Cycle symbol markings-large				£150.00	£180.17	£0	Taken from NB spreadsheet
1200	Arrows in reflectorised white 4.0m long straight or turning	small arrows	13	nr	£27.58	£33.13	£431	Spon's 2018 pg. 319
1200	Allowance for unmeasured items		20%	%	£181,197.38		£36,239	N/A
				SUB TOTAL			£312,951	
		CONTINGENCY					£0.00	
				Overall Total			£312,951	

PROJECT: 40820 Manston
Wood: Junction 4

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Exclusions:
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No allowance has been included for VAT
No allowance has been included for resurfacing or carriageway repair or improvement works
No allowance has been included for any potential costs in relation to environmental issues, habitat or sites of special scientific interest
No allowance has been included for Traffic Regulation Orders (TRO) and any associated TRO consultation

No allowance has been included for upgrades to existing sewerage system (drainage assumed connected to existing system)

No allowance has been included for any structures (retaining walls, culverts etc.)
No allowance has been included for new or improved levels of street lighting

CAPEX GRAND SUMMARY

SERIES	DESCRIPTION		Junction 4	
			35%	
100	Preliminaries, including restricted working hours			£108,265.71
200	Site Clearance			£5,829
600	Earthworks			£5,196
700	Pavements			£0
1100	Kerbs, Footways and Paved Areas			£7,335
1200	Traffic Signs and Road Markings			£290,969
	Construction Cost Sub-Total		**£417,596**	
	Project On-Costs	**36.0%**	**£150,335**	
	Site Investigation	6.0%		£25,056
	Concept Design	3.0%		£12,528
	Design & Planning	5.0%		£20,880
	Publicity	6.0%		£25,056
	Compensation	0.0%		£0
	Legal	7.0%		£29,232
	CDM (now included in design)	2.0%		£8,352
	Site Supervision	3.0%		£12,528
	Project Management	2.0%		£8,352
	Risk - General	2.0%		£8,352
	Scheme Optimism Bias	44.0%	**£183,742**	
	CAPEX SUB-TOTAL		**£751,673.33**	
	CONTINGENCY	**10%**	**£75,167.33**	
CAPEX TOTAL (EXCLUDING VAT)			**£826,840.67**	
EST. ACCURACY LOWER LIMIT	**-**	**15%**	**£703,000.00**	
EST. ACCURACY UPPER LIMIT	**+**	**30%**	**£1,075,000.00**	

Title:	**Wood: Junction 4**				
Drawing:	38199-Lon317b				
	Based on estimated sizing				
Notes:	**Cost estimate excludes the following:** **1)** New Drainage, or diversion of existing **2)** Street lighting, illuminated signage, road signage **3)** Third party land costs **4)** No new or relocation of statutory utilities **5)** Landscaping				

Base Date Spons 2018	2Q17	317
Current	3Q2018	315
Spons 2018 update		0.99
Location Factor	BCIS	1.15

Estimate Base Date	4Q19	329
Inflation Adjustment		1.04

Indicative Highway Engineering cost

Series	Item Description	Assumptions	Quantity	Unit	Rate	Rate (+uplift)	Price	Comment
200	Series 200 - Site Clearance							
200	Site Clearance	General Site Clearance - Open Field Site	2	ha	£1,923.92	£2,296.26	£4,593	Spon's 2018 Pg. 385
200	Kerb removal	Take up or take down & set aside for re-use/tip	45	m	£4.94	£5.90	£265	Spon's 2018 Pg. 386
200	Allowance for unmeasured items		20%	%	£4,857.85		£972	N/A
600	Series 600 - Earthworks							
600	Excavation for new carriageway	General excavation of acceptable Class 5A material. Excavate 550mm		m3	£3.76	£4.52	£0	Spon's 2018, pg. 409
600	Excavation for new footway	General excavation of acceptable Class 5A material. Excavate 210mm	10	m3	£3.76	£4.52	£45	Spon's 2018, pg. 409
600	Excavation for new verge	General excavation of acceptable Class 5A material. Excavate 150mm	19	m3	£3.76	£4.52	£86	Spon's 2018, pg. 409
600	Disposal off site of excavated material	Disposal of acceptable material Class 5A. Using 10t Capacity lorry; haul distance for 1km = £4.34. £2.17 per further Km haul. Assumed 10km haul distance.	141	m3	£27.12	£32.57	£4,593	Spon's 2018, pg. 411
600	Top soiling	Top soilling 150mm thick to surface		m2	£7.17	£8.61	£0	Spon's 2017, pg. 418
600	Allowance for unmeasured items		10%	%	£4,723.92		£472	N/A
700	Series 700 - Pavements							
700	Cold Milling	50mm deep; scarifying surface		m2	£19.77	£23.75	£0	Spon's 2018, pg. 431
700	Sub-Base	Granular Material DfT Type 1 - Sub-base in carriageway - 200mm		m3	£39.70	£47.68	£0	Spon's 2018, pg. 427
700	Base	Dense Bitumen Macadam - Base to DfT Clause 903 - 200mm		m2	£34.34	£41.25	£0	Spon's 2018, pg. 428
700	Binder Course	Dense Bitumen Macadam - Binder Course to DfT Clause 904 - 100mm		m2	£19.76	£23.73	£0	Spon's 2018, pg. 428
700	Surface Course	Dense Bitumen Macadam - Surface Course to DfT Clause 909 - 50mm		m2	£14.60	£17.54	£0	Spon's 2018, pg. 428
700	Allowance for unmeasured items		10%	%	£0.00		£0	N/A
1100	Series 1100 - Kerbs, Footways and paved areas							
1100	Foundations to kerbs	300x150mm - Mass concrete		m	£5.90	£7.09	£0	Spon's 2018, pg. 433
1100	Kerbs	150x305mm - Straight or curved exceeding 12m radius	56	m	£23.82	£28.61	£1,610	Spon's 2017, pg. 433
1100	Edge Kerbs	150x50mm - Straight or curved exceeding 12m radius	2	m	£6.24	£7.49	£12	Spon's 2017, pg. 433
1100	Drop kerbs	150mm x 305mm kerb - incl pedestrian island drop kerb	28	m	£30.20	£36.27	£1,016	Spon's 2017, pg. 433
1100	Footway Sub-base	150mm - Thick hardcore	100	m2	£5.71	£6.86	£686	Spon's 2017, pg. 436
1100	Footway - Paved Area	Bitumen macadam surfacing. 40mm binder course + 20mm surface course	100	m2	£23.22	£27.89	£2,789	Spon's 2017, pg. 437
1100	Allowance for unmeasured items		20%	%	£6,112.81		£1,223	N/A
1200	Series 1200 - Traffic Signs/Road Markings							
1200	Give Way	200m wide with 0.6m line and 0.3m gap		m	£1.71	£2.05	£0	Spon's 2018, pg. 443
1200	8m long double headed arrow			nr	£73.43	£88.20	£0	Spon's 2018, pg.443
1200	4m long straight or turning arrow		14	nr	£28.94	£34.76	£487	Spon's 2018, pg.443
1200	Triangles in reflectorized white	3.75m high		nr	£18.32	£22.00	£0	Spon's 2018, pg.443
1200	Ancillary line in reflectorized white	200mm in hatched areas	54	m	£1.71	£2.05	£111	Spon's 2018, pg.443
1200	Intermittent line in reflectorised white	100mm wide	243	m	£0.99	£1.19	£289	Spon's 2018, pg.443
1200	Continuous line in reflectorized white	150mm wide	-	m	£1.48	£1.78	£0	Spon's 2018, pg.443
	100mmx100mm square bi directional reflecting road stud with amber corner reflectors			nr	£8.87	£10.65	£0	Spon's 2018, pg. 444
	Traffic Signal Installation		1	nr	£200,000.00	£240,222.22	£240,222	
	Surface markings; reflectorised white	letters or numerals; 1.6m high	133	nr	£8.55	£10.27	£1,366	Spon's 2018, pg. 319
1200	Allowance for unmeasured items		20%	%	£242,474.57		£48,495	N/A
					SUB TOTAL		£309,331	
		CONTINGENCY					£0.00	
					Overall Total		£309,331	

PROJECT: 40820 Manston
Wood: Junction 6

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No allowance has been included for drainage including associated connections/approvals
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No allowance has been included for resurfacing or carriageway repair or improvement works
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No allowance has been included for Traffic Regulation Orders (TRO) and any associated TRO consultation

No allowance has been included for upgrades to existing sewerage system (drainage assumed connected to existing system)

No allowance has been included for any structures (retaining walls, culverts etc.)
No allowance has been included for new or improved levels of street lighting

CAPEX GRAND SUMMARY

SERIES	DESCRIPTION		Junction 6	
			35%	
100	Preliminaries, including restricted working hours			£108,265.71
200	Site Clearance			£5,829
600	Earthworks			£5,196
700	Pavements			£0
1100	Kerbs, Footways and Paved Areas			£7,335
1200	Traffic Signs and Road Markings			£290,969
	Construction Cost Sub-Total		**£417,596**	
	Project On-Costs	**36.0%**	**£150,335**	
	Site Investigation	6.0%		£25,056
	Concept Design	3.0%		£12,528
	Design & Planning	5.0%		£20,880
	Publicity	6.0%		£25,056
	Compensation	0.0%		£0
	Legal	7.0%		£29,232
	CDM (now included in design)	2.0%		£8,352
	Site Supervision	3.0%		£12,528
	Project Management	2.0%		£8,352
	Risk - General	2.0%		£8,352
	Scheme Optimism Bias	44.0%	**£183,742**	
	CAPEX SUB-TOTAL		**£751,673.33**	
	CONTINGENCY	**10%**	**£75,167.33**	
CAPEX TOTAL (EXCLUDING VAT)			**£826,840.67**	
EST. ACCURACY LOWER LIMIT	**-**	**15%**	**£703,000.00**	
EST. ACCURACY UPPER LIMIT	**+**	**30%**	**£1,075,000.00**	

Title: Wood: Junction 6
Drawing: 38199-Lon317b

Based on estimated sizing

Notes:
Cost estimate excludes the following:
1) New Drainage, or diversion of existing
2) Street lighting, illuminated signage, road signage
3) Third party land costs
4) No new or relocation of statutory utilities
5) Landscaping

Base Date Spons 2018	2Q17	317
Current	3Q2018	315
Spons 2018 update		0.99
Location Factor	BCIS	1.15

Estimate Base Date	4Q19	329
Inflation Adjustment		1.04

Indicative Highway Engineering cost

Series	Item Description	Assumptions	Quantity	Unit	Rate	Rate (+uplift)	Price	Comment
200	**Series 200 - Site Clearance**							
200	Site Clearance	General Site Clearance - Open Field Site	2	ha	£1,923.92	£2,296.26	£4,593	Spon's 2018 Pg. 385
200	Kerb removal	Take up or take down & set aside for re-use/tip	45	m	£4.94	£5.90	£265	Spon's 2018 Pg. 386
200	Allowance for unmeasured items		20%	%	£4,857.85		£972	N/A
600	**Series 600 - Earthworks**							
600	Excavation for new carriageway	General excavation of acceptable Class 5A material. Excavate 550mm		m3	£3.76	£4.52	£0	Spon's 2018, pg. 409
600	Excavation for new footway	General excavation of acceptable Class 5A material. Excavate 210mm	10	m3	£3.76	£4.52	£45	Spon's 2018, pg. 409
600	Excavation for new verge	General excavation of acceptable Class 5A material. Excavate 150mm	19	m3	£3.76	£4.52	£86	Spon's 2018, pg. 409
600	Disposal off site of excavated material	Disposal of acceptable material Class 5A. Using 10t Capacity lorry; haul distance for 1km = £4.34. £2.17 per further Km haul. Assumed 10km haul distance.	141	m3	£27.12	£32.57	£4,593	Spon's 2018, pg. 411
600	Top soiling	Top soilling 150mm thick to surface		m2	£7.17	£8.61	£0	Spon's 2017, pg. 418
600	Allowance for unmeasured items		10%	%	£4,723.92		£472	N/A
700	**Series 700 - Pavements**							
700	Cold Milling	50mm deep; scarifying surface		m2	£19.77	£23.75	£0	Spon's 2018, pg. 431
700	Sub-Base	Granular Material DfT Type 1 - Sub-base in carriageway - 200mm		m3	£39.70	£47.68	£0	Spon's 2018, pg. 427
700	Base	Dense Bitumen Macadam - Base to DfT Clause 903 - 200mm		m2	£34.34	£41.25	£0	Spon's 2018, pg. 428
700	Binder Course	Dense Bitumen Macadam - Binder Course to DfT Clause 904 - 100mm		m2	£19.76	£23.73	£0	Spon's 2018, pg. 428
700	Surface Course	Dense Bitumen Macadam - Surface Course to DfT Clause 909 - 50mm		m2	£14.60	£17.54	£0	Spon's 2018, pg. 428
700	Allowance for unmeasured items		10%	%	£0.00		£0	N/A
1100	**Series 1100 - Kerbs, Footways and paved areas**							
1100	Foundations to kerbs	300x150mm - Mass concrete		m	£5.90	£7.09	£0	Spon's 2018, pg. 433
1100	Kerbs	150x305mm - Straight or curved exceeding 12m radius	56	m	£23.82	£28.61	£1,610	Spon's 2017, pg. 433
1100	Edge Kerbs	150x50mm - Straight or curved exceeding 12m radius	2	m	£6.24	£7.49	£12	Spon's 2017, pg. 433
1100	Drop kerbs	150mm x 305mm kerb - incl pedestrian island drop kerb	28	m	£30.20	£36.27	£1,016	Spon's 2017, pg. 433
1100	Footway Sub-base	150mm - Thick hardcore	100	m2	£5.71	£6.86	£686	Spon's 2017, pg. 436
1100	Footway - Paved Area	Bitumen macadam surfacing. 40mm binder course + 20mm surface course	100	m2	£23.22	£27.89	£2,789	Spon's 2017, pg. 437
1100	Allowance for unmeasured items		20%	%	£6,112.81		£1,223	N/A
1200	**Series 1200 - Traffic Signs/Road Markings**							
1200	Give Way	200m wide with 0.6m line and 0.3m gap		m	£1.71	£2.05	£0	Spon's 2018, pg. 443
1200	8m long double headed arrow			nr	£73.43	£88.20	£0	Spon's 2018, pg.443
1200	4m long straight or turning arrow		14	nr	£28.94	£34.76	£487	Spon's 2018, pg.443
1200	Triangles in reflectorized white	3.75m high		nr	£18.32	£22.00	£0	Spon's 2018, pg.443
1200	Ancillary line in reflectorized white	200mm in hatched areas	54	m	£1.71	£2.05	£111	Spon's 2018, pg.443
1200	Intermittent line in reflectorised white	100mm wide	243	m	£0.99	£1.19	£289	Spon's 2018, pg.443
1200	Continuous line in reflectorized white	150mm wide	-	m	£1.48	£1.78	£0	Spon's 2018, pg.443
	100mmx100mm square bi directional reflecting road stud with amber corner reflectors			nr	£8.87	£10.65	£0	Spon's 2018, pg. 444
	Traffic Signal Installation		1	nr	£200,000.00	£240,222.22	£240,222	
	Surface markings; reflectorised white	letters or numerals; 1.6m high	133	nr	£8.55	£10.27	£1,366	Spon's 2018, pg. 319
1200	Allowance for unmeasured items		20%	%	£242,474.57		£48,495	N/A
					SUB TOTAL		£309,331	
	CONTINGENCY						£0.00	
					Overall Total		£309,331	

PROJECT: 40820 Manston
Wood: Junction 7

Please note that the scheme design is not yet fully detailed, and that the design will need to be further developed, revised and refined during the detailed design phase. Please also note that any quantities or costs shown or included from the concept/preliminary pre-tender design should be treated as indicative only.

Exclusions:
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No allowance has been included for resurfacing or carriageway repair or improvement works
No allowance has been included for any potential costs in relation to environmental issues, habitat or sites of special scientific interest
No allowance has been included for Traffic Regulation Orders (TRO) and any associated TRO consultation

No allowance has been included for upgrades to existing sewerage system (drainage assumed connected to existing system)

No allowance has been included for any structures (retaining walls, culverts etc.)
No allowance has been included for new or improved levels of street lighting

CAPEX GRAND SUMMARY

SERIES	DESCRIPTION		Junction 7	
			35%	
100	Preliminaries, including restricted working hours			£21,203.84
200	Site Clearance			£5,688
600	Earthworks			£60
700	Pavements			£4,419
1100	Kerbs, Footways and Paved Areas			£1,373
1200	Traffic Signs and Road Markings			£49,043
	Construction Cost Sub-Total		**£81,786**	
	Project On-Costs	**36.0%**	**£29,443**	
	Site Investigation	6.0%		£4,907
	Concept Design	3.0%		£2,454
	Design & Planning	5.0%		£4,089
	Publicity	6.0%		£4,907
	Compensation	0.0%		£0
	Legal	7.0%		£5,725
	CDM (now included in design)	2.0%		£1,636
	Site Supervision	3.0%		£2,454
	Project Management	2.0%		£1,636
	Risk - General	2.0%		£1,636
	Scheme Optimism Bias	44.0%	**£35,986**	
	CAPEX SUB-TOTAL		**£147,215**	
	CONTINGENCY	**10%**	**£14,721.52**	
	CAPEX TOTAL (EXCLUDING VAT)		**£161,937**	
	EST. ACCURACY LOWER LIMIT -	**15%**	**£138,000**	
	EST. ACCURACY UPPER LIMIT +	**30%**	**£211,000**	

Title: Wood: Junction 7
Drawing: 38199-Lon367b

Notes:
Based on estimated sizing

Cost estimate excludes the following:
1) New Drainage, or diversion of existing
2) Street lighting, illuminated signage, road signage
3) Third party land costs
4) No new or relocation of statutory utilities
5) Landscaping

Base Date Spons 2018	2Q17	317
Current	3Q2018	315
Spons 2018 update		0.99
Location Factor	BCIS	1.15

Estimate Base Date	4Q19	329
Inflation Adjustment		1.04

Indicative Highway Engineering cost

Series	Item Description	Assumptions	Quantity	Unit	Rate	Rate (+uplift)	Price	Comment
200	**Series 200 - Site Clearance**							
200	Site Clearance	General Site Clearance - Open Field Site	2	ha	£1,923.92	£2,296.26	£4,593	Spon's 2018 Pg. 385
200	Kerb removal	Take up or take down & set aside for re-use/tip	25	m	£4.94	£5.90	£147	Spon's 2018 Pg. 386
200	Allowance for unmeasured items		20%	%	£4,739.93		£948	N/A
600	**Series 600 - Earthworks**							
600	Excavation for new carriageway	General excavation of acceptable Class 5A material. Excavate 550mm	11	m3	£3.76	£4.52	£50	Spon's 2018, pg. 409
600	Excavation for new footway	General excavation of acceptable Class 5A material. Excavate 210mm		m3	£3.76	£4.52	£0	Spon's 2018, pg. 409
600	Excavation for new verge	General excavation of acceptable Class 5A material. Excavate 150mm		m3	£3.76	£4.52	£0	Spon's 2018, pg. 409
600	Disposal off site of excavated material	Disposal of acceptable material Class 5A. Using 10t Capacity lorry; haul distance for 1km = £4.34. £2.17 per further Km haul. Assumed 10km haul distance.		m3	£27.12	£32.57	£0	Spon's 2018, pg. 411
600	Top soiling	Top soilling 150mm thick to surface		m2	£7.17	£8.61	£0	Spon's 2017, pg. 418
600	Allowance for unmeasured items		20%	%	£49.68		£10	N/A
700	**Series 700 - Pavements**							
700	Cold Milling	50mm deep; scarifying surface		m2	£19.77	£23.75	£0	Spon's 2018, pg. 431
700	Sub-Base	Granular Material DfT Type 1 - Sub-base in carriageway - 200mm	8	m3	£39.70	£47.68	£381	Spon's 2018, pg. 427
700	Base	Dense Bitumen Macadam - Base to DfT Clause 903 - 200mm	40	m2	£34.34	£41.25	£1,650	Spon's 2018, pg. 428
700	Binder Course	Dense Bitumen Macadam - Binder Course to DfT Clause 904 - 100mm	40	m2	£19.76	£23.73	£949	Spon's 2018, pg. 428
700	Surface Course	Dense Bitumen Macadam - Surface Course to DfT Clause 909 - 50mm	40	m2	£14.60	£17.54	£701	Spon's 2018, pg. 428
700	Allowance for unmeasured items		20%	%	£3,682.13		£736	N/A
1100	**Series 1100 - Kerbs, Footways and paved areas**							
1100	Foundations to kerbs	300x150mm - Mass concrete		m	£5.90	£7.09	£0	Spon's 2018, pg. 433
1100	Kerbs	150x305mm - Straight or curved exceeding 12m radius	40	m	£23.82	£28.61	£1,144	Spon's 2017, pg. 433
1100	Edge Kerbs	150x50mm - Straight or curved exceeding 12m radius		m	£6.24	£7.49	£0	Spon's 2017, pg. 433
1100	Drop kerbs	150mm x 305mm kerb - incl pedestrian island drop kerb		m	£30.20	£36.27	£0	Spon's 2017, pg. 433
1100	Footway Sub-base	150mm - Thick hardcore		m2	£5.71	£6.86	£0	Spon's 2017, pg. 436
1100	Footway - Paved Area	Bitumen macadam surfacing. 40mm binder course + 20mm surface course		m2	£23.22	£27.89	£0	Spon's 2017, pg. 437
1100	Allowance for unmeasured items		20%	%	£1,144.42		£229	N/A
1200	**Series 1200 - Traffic Signs/Road Markings**							
1200	Give Way	200m wide with 0.6m line and 0.3m gap		m	£1.71	£2.05	£0	Spon's 2018, pg. 443
1200	8m long double headed arrow			nr	£73.43	£88.20	£0	Spon's 2018, pg.443
1200	4m long straight or turning arrow			nr	£28.94	£34.76	£0	Spon's 2018, pg.443
1200	Triangles in reflectorized white	3.75m high		nr	£18.32	£22.00	£0	Spon's 2018, pg.443
1200	Ancillary line in reflectorized white	200mm in hatched areas		m	£1.71	£2.05	£0	Spon's 2018, pg.443
1200	Intermittent line in reflectorised white	100mm wide		m	£0.99	£1.19	£0	Spon's 2018, pg.443
1200	Continuous line in reflectorized white	150mm wide		m	£1.48	£1.78	£0	Spon's 2018, pg.443
	100mmx100mm square bi directional reflecting road stud with amber corner reflectors			nr	£8.87	£10.65	£0	Spon's 2018, pg. 444
	Signal Pedestal			nr	£51.18	£61.47	£0	Spon's 2018, pg. 444
	Loop dectector unit pedestal			nr	£23.19	£27.85	£0	Spon's 2018, pg. 444
	Excavate trench for traffic signal cable, depth ne 1.5m;supports, backfilling 450mm wide			m	£17.06	£20.49	£0	Spon's 2018, pg. 444
	Controller Unit Box			nr	£52.18	£62.67	£0	Spon's 2018, pg. 444
	Saw cutting grooves in pavement for dectector loops and feeder cables, with hot bitumen sealant after installation			m	£25.02	£30.05	£0	Spon's 2018, pg. 444
	traffic signs	1200m x 400m	3	nr	£62.57	£75.15	£225	Spon's 2018, pg. 317
	Large ADS sign, including illumination		3	nr	£10,000.00	£12,011.11	£36,033	
	Surface markings; reflectorised white	letters or numerals; 3.75m high	174	nr	£22.06	£26.50	£4,610	Spon's 2018, pg. 319
1200	Allowance for unmeasured items		20%	%	£40,869.19		£8,174	N/A
					SUB TOTAL		£60,582	
		CONTINGENCY					£0.00	
					Overall Total		£60,582	

PROJECT: 40820 Manston
Wood: Junction 10

Please note that the scheme design is not yet fully detailed, and that the design will need to be further developed, revised and refined during the detailed design phase. Please also note that any quantities or costs shown or included from the concept/preliminary pre-tender design should be treated as indicative only.

Exclusions:

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No allowance has been included to improve existing road specification/structures

No allowance has been included for statutory undertakers diversion/protection work or associated design costs

No allowance has been included for drainage including associated connections/approvals

No allowance has been included for VAT

No allowance has been included for resurfacing or carriageway repair or improvement works

No allowance has been included for any potential costs in relation to environmental issues, habitat or sites of special scientific interest

No allowance has been included for Traffic Regulation Orders (TRO) and any associated TRO consultation

No allowance has been included for upgrades to existing sewerage system (drainage assumed connected to existing system)

No allowance has been included for any structures (retaining walls, culverts etc.)

No allowance has been included for new or improved levels of street lighting

CAPEX ESTIMATE GRAND SUMMARY

SERIES	DESCRIPTION		Junction 10	
			35%	
100	Preliminaries, including restricted working hours			£9,310.71
200	Site Clearance			£2,735
600	Earthworks			£809
700	Pavements			£18,314
1100	Kerbs, Footways and Paved Areas			£4,039
1200	Traffic Signs and Road Markings			£704
	Construction Cost Sub-Total		**£35,913**	
	Project On-Costs	**36.0%**	**£12,929**	
	Site Investigation	6.0%		£2,155
	Concept Design	3.0%		£1,077
	Design & Planning	5.0%		£1,796
	Publicity	6.0%		£2,155
	Compensation	0.0%		£0
	Legal	7.0%		£2,514
	CDM (now included in design)	2.0%		£718
	Site Supervision	3.0%		£1,077
	Project Management	2.0%		£718
	Risk - General	2.0%		£718
	Scheme Optimism Bias	44.0%	**£15,802**	
	CAPEX SUB-TOTAL		**£64,643**	
	CONTINGENCY	**10%**	**£6,464.29**	
	CAPEX TOTAL (EXCLUDING VAT)		**£71,107**	
	EST. ACCURACY LOWER LIMIT -	**15%**	**£60,000**	
	EST. ACCURACY UPPER LIMIT +	**30%**	**£92,000**	

Title:	**Wood: Junction 10**		
Drawing:	R:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Infrastructure costings\Off-site mitigation\OFFISTE COSTING WORK MAY 19		

Based on estimated sizing

Notes:

Cost estimate excludes the following:
1) New Drainage, or diversion of existing
2) Street lighting, illuminated signage, road signage
3) Third party land costs
4) No new or relocation of statutory utilities
5) Landscaping

Base Date Spons 2018	2Q17	317
Current	3Q2018	315
Spons 2018 update		0.99
Location Factor	BCIS	1.15

Estimate Base Date	4Q19	329
Inflation Adjustment		1.04

Indicative Highway Engineering cost

Series	Item Description	Assumptions	Quantity	Unit	Rate	Rate (+uplift)	Price	Comment
200	**Series 200 - Site Clearance**							
200	Site Clearance	General Site Clearance - Open Field Site	1	ha	£1,923.92	£2,296.26	£1,837	Spon's 2018 Pg. 385
200	Kerb removal	Take up or take down & set aside for re-use/tip	75	m	£4.94	£5.90	£442	Spon's 2018 Pg. 386
200	Allowance for unmeasured items		20%	%	£2,279.21		£456	N/A
600	**Series 600 - Earthworks**							
600	Excavation for new carriageway	General excavation of acceptable Class 5A material. Excavate 550mm	18	m3	£3.76	£4.52	£82	Spon's 2018, pg. 409
600	Excavation for new footway	General excavation of acceptable Class 5A material. Excavate 210mm		m3	£3.76	£4.52	£0	Spon's 2018, pg. 409
600	Excavation for new verge	General excavation of acceptable Class 5A material. Excavate 150mm		m3	£3.76	£4.52	£0	Spon's 2018, pg. 409
600	Disposal off site of excavated material	Disposal of acceptable material Class 5A. Using 10t Capacity lorry; haul distance for 1km = £4.34. £2.17 per further Km haul. Assumed 10km haul distance.	18	m3	£27.12	£32.57	£592	Spon's 2018, pg. 411
600	Top soiling	Top soilling 150mm thick to surface		m2	£7.17	£8.61	£0	Spon's 2017, pg. 418
600	Allowance for unmeasured items		20%	%	£674.54		£135	N/A
700	**Series 700 - Pavements**							
700	Cold Milling	50mm deep; scarifying surface	282	m2	£19.77	£23.75	£6,696	Spon's 2018, pg. 431
700	Sub-Base	Granular Material DfT Type 1 - Sub-base in carriageway - 200mm	7	m3	£39.70	£47.68	£315	Spon's 2018, pg. 427
700	Base	Dense Bitumen Macadam - Base to DfT Clause 903 - 200mm	33	m2	£34.34	£41.25	£1,362	Spon's 2018, pg. 428
700	Binder Course	Dense Bitumen Macadam - Binder Course to DfT Clause 904 - 100mm	33	m2	£19.76	£23.73	£784	Spon's 2018, pg. 428
700	Surface Course	Dense Bitumen Macadam - Surface Course to DfT Clause 909 - 50mm	348	m2	£14.60	£17.54	£6,104	Spon's 2018, pg. 428
700	Allowance for unmeasured items		20%	%	£15,261.31		£3,052	N/A
1100	**Series 1100 - Kerbs, Footways and paved areas**							
1100	Foundations to kerbs	300x150mm - Mass concrete	94	m	£5.90	£7.09	£668	Spon's 2018, pg. 433
1100	Kerbs	150x305mm - Straight or curved exceeding 12m radius	94	m	£23.82	£28.61	£2,698	Spon's 2017, pg. 433
1100	Edge Kerbs	150x50mm - Straight or curved exceeding 12m radius		m	£6.24	£7.49	£0	Spon's 2017, pg. 433
1100	Drop kerbs	150mm x 305mm kerb - incl pedestrian island drop kerb		m	£30.20	£36.27	£0	Spon's 2017, pg. 433
1100	Footway Sub-base	150mm - Thick hardcore		m2	£5.71	£6.86	£0	Spon's 2017, pg. 436
1100	Footway - Paved Area	Bitumen macadam surfacing. 40mm binder course + 20mm surface course		m2	£23.22	£27.89	£0	Spon's 2017, pg. 437
	Cobble Paving	Bedding on 25mm cement mortar; filling joints; excluding subbase		m2	£51.04	£61.30	£0	Spon's 2018, pg. 317
1100	Allowance for unmeasured items		20%	%	£3,366.23		£673	N/A
1200	**Series 1200 - Traffic Signs/Road Markings**							
1200	Give Way	200m wide with 0.6m line and 0.3m gap	53	m	£1.71	£2.05	£109	Spon's 2018, pg. 443
1200	8m long double headed arrow			nr	£73.43	£88.20	£0	Spon's 2018, pg.443
1200	4m long straight or turning arrow			nr	£28.94	£34.76	£0	Spon's 2018, pg.443
1200	Triangles in reflectorized white	3.75m high		nr	£18.32	£22.00	£0	Spon's 2018, pg.443
1200	Ancillary line in reflectorized white	200mm in hatched areas		m	£1.71	£2.05	£0	Spon's 2018, pg.443
1200	Intermittent line in reflectorised white	100mm wide	40	m	£0.99	£1.19	£48	Spon's 2018, pg.443
1200	Continuous line in reflectorized white	150mm wide		m	£1.48	£1.78	£0	Spon's 2018, pg.443
	100mmx100mm square bi directional reflecting road stud with amber corner reflectors			nr	£8.87	£10.65	£0	Spon's 2018, pg. 444
	Signal Pedestal			nr	£51.18	£61.47	£0	Spon's 2018, pg. 444
	Loop dectector unit pedestal			nr	£23.19	£27.85	£0	Spon's 2018, pg. 444
	Excavate trench for traffic signal cable, depth ne 1.5m;supports, backfilling 450mm wide			m	£17.06	£20.49	£0	Spon's 2018, pg. 444
	Controller Unit Box			nr	£52.18	£62.67	£0	Spon's 2018, pg. 444
	Saw cutting grooves in pavement for dectector loops and feeder cables, with hot bitumen sealant after installation			m	£25.02	£30.05	£0	Spon's 2018, pg. 444
	traffic signs	1200mm x 400mm		nr	£62.57	£75.15	£0	Spon's 2018, pg. 317
	Relecting Road Studs	100mm x 100mm		nr	£7.17	£8.61	£0	Spons's 2018 pg, 321
	Surface markings; reflectorised white	letters or numerals; 1.6m high						Spon's 2018 pg. 319
	Surface markings; reflectorised white	letters or numerals; 3.75m high		nr	£22.06	£26.50	£0	Spon's 2018, pg. 319
	Cycle symbol markings-large				£150.00	£180.17	£0	Taken from NB spreadsheet
1200	Arrows in reflectorised white 4.0m long straight or turning	small arrows	13	nr	£27.58	£33.13	£431	Spon's 2018 pg. 319
1200	Allowance for unmeasured items		20%	%	£587.07		£117	N/A
				SUB TOTAL			£26,602	
		CONTINGENCY					£0.00	
				Overall Total			£26,602	

PROJECT: 40820 Manston
Wood: Junction 13

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No allowance has been included for statutory undertakers diversion/protection work or associated design costs

No allowance has been included for drainage including associated connections/approvals
No allowance has been included for VAT
No allowance has been included for resurfacing or carriageway repair or improvement works
No allowance has been included for any potential costs in relation to environmental issues, habitat or sites of special scientific interest
No allowance has been included for Traffic Regulation Orders (TRO) and any associated TRO consultation

No allowance has been included for upgrades to existing sewerage system (drainage assumed connected to existing system)

No allowance has been included for any structures (retaining walls, culverts etc.)
No allowance has been included for new or improved levels of street lighting

CAPEX ESTIMATE GRAND SUMMARY

SERIES	DESCRIPTION		Junction 13	
			35%	
100	Preliminaries, including restricted working hours			£77,297.11
200	Site Clearance			£3,392
600	Earthworks			£1,032
700	Pavements			£64,756
1100	Kerbs, Footways and Paved Areas			£6,413
1200	Traffic Signs and Road Markings			£145,256
	Construction Cost Sub-Total		**£298,146**	
	Project On-Costs	36.0%	**£107,333**	
	Site Investigation	6.0%		£17,889
	Concept Design	3.0%		£8,944
	Design & Planning	5.0%		£14,907
	Publicity	6.0%		£17,889
	Compensation	0.0%		£0
	Legal	7.0%		£20,870
	CDM (now included in design)	2.0%		£5,963
	Site Supervision	3.0%		£8,944
	Project Management	2.0%		£5,963
	Risk - General	2.0%		£5,963
	Scheme Optimism Bias	44.0%	**£131,184**	
	CAPEX SUB-TOTAL		**£536,663**	
	CONTINGENCY	10%	**£53,666.28**	
CAPEX TOTAL (EXCLUDING VAT)			**£590,329**	
EST. ACCURACY LOWER LIMIT	**-**	**15%**	**£502,000**	
EST. ACCURACY UPPER LIMIT	**+**	**30%**	**£767,000**	

Title: Wood: Junction 13
Drawing: 38199-Lon142B R:\Projects\38199 Manston Airport DCO EIA\4 Design\AutoCAD

Based on estimated sizing

Notes:
Cost estimate excludes the following:
1) New Drainage, or diversion of existing
2) Street lighting, illuminated signage, road signage
3) Third party land costs
4) No new or relocation of statutory utilities
5) Landscaping

Base Date Spons 2018	2Q17	317
Current	3Q2018	315
Spons 2018 update		0.99
Location Factor	BCIS	1.15

Estimate Base Date	4Q19	329
Inflation Adjustment		1.04

Indicative Highway Engineering cost

Series	Item Description	Assumptions	Quantity	Unit	Rate	Rate (+uplift)	Price	Comment
200	Series 200 - Site Clearance							
200	Site Clearance	General Site Clearance - Open Field Site	1	ha	£1,923.92	£2,296.26	£2,296	Spon's 2018 Pg. 385
200	Kerb removal	Take up or take down & set aside for re-use/tip	90	m	£4.94	£5.90	£531	Spon's 2018 Pg. 386
200	Allowance for unmeasured items		20%	%	£2,826.91		£565	N/A
600	Series 600 - Earthworks							
600	Excavation for new carriageway	General excavation of acceptable Class 5A material. Excavate 550mm	23	m3	£3.76	£4.52	£102	Spon's 2018, pg. 409
600	Excavation for new footway	General excavation of acceptable Class 5A material. Excavate 210mm	2	m3	£3.76	£4.52	£9	Spon's 2018, pg. 409
600	Excavation for new verge	General excavation of acceptable Class 5A material. Excavate 150mm	-	m3	£3.76	£4.52	£0	Spon's 2018, pg. 409
600	Disposal off site of excavated material	Disposal of acceptable material Class 5A. Using 10t Capacity lorry; haul distance for 1km = £4.34. £2.17 per further Km haul. Assumed 10km haul distance.	23	m3	£27.12	£32.57	£749	Spon's 2018, pg. 411
600	Top soiling	Top soilling 150mm thick to surface	-	m2	£7.17	£8.61	£0	Spon's 2017, pg. 418
600	Allowance for unmeasured items		20%	%	£859.85		£172	N/A
700	Series 700 - Pavements							
700	Cold Milling	50mm deep; scarifying surface	1,200	m2	£19.77	£23.75	£28,495	Spon's 2018, pg. 431
700	Sub-Base	Granular Material DfT Type 1 - Sub-base in carriageway - 200mm	8	m3	£39.70	£47.68	£381	Spon's 2018, pg. 427
700	Base	Dense Bitumen Macadam - Base to DfT Clause 903 - 200mm	49	m2	£34.34	£41.25	£2,021	Spon's 2018, pg. 428
700	Binder Course	Dense Bitumen Macadam - Binder Course to DfT Clause 904 - 100mm	49	m2	£19.76	£23.73	£1,163	Spon's 2018, pg. 428
700	Surface Course	Dense Bitumen Macadam - Surface Course to DfT Clause 909 - 50mm	1,249	m2	£14.60	£17.54	£21,903	Spon's 2018, pg. 428
700	Allowance for unmeasured items		20%	%	£53,963.40		£10,793	N/A
1100	Series 1100 - Kerbs, Footways and paved areas							
1100	Foundations to kerbs	300x150mm - Mass concrete	139	m	£5.90	£7.09	£985	Spon's 2018, pg. 433
1100	Kerbs	150x305mm - Straight or curved exceeding 12m radius	139	m	£23.82	£28.61	£3,977	Spon's 2017, pg. 433
1100	Edge Kerbs	150x50mm - Straight or curved exceeding 12m radius	-	m	£6.24	£7.49	£0	Spon's 2017, pg. 433
1100	Drop kerbs	150mm x 305mm kerb - incl pedestrian island drop kerb	-	m	£30.20	£36.27	£0	Spon's 2017, pg. 433
1100	Footway Sub-base	150mm - Thick hardcore	11	m2	£5.71	£6.86	£75	Spon's 2017, pg. 436
1100	Footway - Paved Area	Bitumen macadam surfacing. 40mm binder course + 20mm surface course	11	m2	£23.22	£27.89	£307	Spon's 2017, pg. 437
1100	Allowance for unmeasured items		20%	%	£5,344.12		£1,069	N/A
1200	Series 1200 - Traffic Signs/Road Markings							
1200	Give Way	200m wide with 0.6m line and 0.3m gap	9	m	£1.71	£2.05	£18	Spon's 2018, pg. 443
1200	8m long double headed arrow		-	nr	£73.43	£88.20	£0	Spon's 2018, pg.443
1200	4m long straight or turning arrow		1	nr	£28.94	£34.76	£35	Spon's 2018, pg.443
1200	Triangles in reflectorized white	3.75m high	-	nr	£18.32	£22.00	£0	Spon's 2018, pg.443
1200	Ancillary line in reflectorized white	200mm in hatched areas	52	m	£1.71	£2.05	£107	Spon's 2018, pg.443
1200	Intermittent line in reflectorised white	100mm wide	652	m	£0.99	£1.19	£775	Spon's 2018, pg.443
1200	Continuous line in reflectorized white	150mm wide	-	m	£1.48	£1.78	£0	Spon's 2018, pg.443
	100mmx100mm square bi directional reflecting road stud with amber corner reflectors			nr	£8.87	£10.65	£0	Spon's 2018, pg. 444
	Traffic Signal Installation		1	nr	£100,000.00	£120,111.11	£120,111	
	Surface markings; reflectorised white	letters or numerals; 1.6m high	-	nr	£8.55	£10.27	£0	Spon's 2018, pg. 319
1200	Allowance for unmeasured items		20%	%	£121,046.45		£24,209	N/A
				SUB TOTAL			£220,849	
		CONTINGENCY					£0.00	
				Overall Total			£220,849	

PROJECT: 40820 Manston
Wood: Junction 15

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Exclusions:
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No allowance has been included for drainage including associated connections/approvals
No allowance has been included for VAT
No allowance has been included for resurfacing or carriageway repair or improvement works
No allowance has been included for any potential costs in relation to environmental issues, habitat or sites of special scientific interest
No allowance has been included for Traffic Regulation Orders (TRO) and any associated TRO consultation
No allowance has been included for upgrades to existing sewerage system (drainage assumed connected to existing system)
No allowance has been included for any structures (retaining walls, culverts etc.)
No allowance has been included for new or improved levels of street lighting

CAPEX GRAND SUMMARY

			35%	
100	Preliminaries, including restricted working hours			£6,606.16
200	Site Clearance			£3,046
600	Earthworks			£3,350
700	Pavements			£1,562
1100	Kerbs, Footways and Paved Areas			£8,586
1200	Traffic Signs and Road Markings			£2,331
	Construction Cost Sub-Total		**£25,481**	
	Project On-Costs	**36.0%**	**£9,173**	
	Site Investigation	6.0%		£1,529
	Concept Design	3.0%		£764
	Design & Planning	5.0%		£1,274
	Publicity	6.0%		£1,529
	Compensation	0.0%		£0
	Legal	7.0%		£1,784
	CDM (now included in design)	2.0%		£510
	Site Supervision	3.0%		£764
	Project Management	2.0%		£510
	Risk - General	2.0%		£510
	Scheme Optimism Bias	44.0%	**£11,212**	
	CAPEX SUB-TOTAL		**£45,866**	
	CONTINGENCY	**10%**	**£4,586.56**	
	CAPEX TOTAL (EXCLUDING VAT)		**£50,452**	
	EST. ACCURACY LOWER LIMIT -	**15%**	**£43,000**	
	EST. ACCURACY UPPER LIMIT +	**30%**	**£66,000**	

Title:	**Wood: Junction 15**
Drawing:	38199-Lon310a
	Based on estimated sizing
Notes:	**Cost estimate excludes the following:** **1)** New Drainage, or diversion of existing **2)** Street lighting, illuminated signage, road signage **3)** Third party land costs **4)** No new or relocation of statutory utilities **5)** Landscaping

Base Date Spons 2018	2Q17	317
Current	3Q2018	315
Spons 2018 update		0.99
Location Factor	BCIS	1.15

Estimate Base Date	4Q19	329
Inflation Adjustment		1.04

Indicative Highway Engineering cost

Series	Item Description	Assumptions	Quantity	Unit	Rate	Rate (+uplift)	Price	Comment
200	**Series 200 - Site Clearance**							
200	Site Clearance	General Site Clearance - Open Field Site	1	ha	£1,923.92	£2,296.26	£2,296	Spon's 2018 Pg. 385
200	Kerb removal	Take up or take down & set aside for re-use/tip	41	m	£4.94	£5.90	£242	Spon's 2018 Pg. 386
200	Allowance for unmeasured items		20%	%	£2,538.00		£508	N/A
600	**Series 600 - Earthworks**							
600	Excavation for new carriageway	General excavation of acceptable Class 5A material. Excavate 550mm	10	m3	£3.76	£4.52	£45	Spon's 2018, pg. 409
600	Excavation for new footway	General excavation of acceptable Class 5A material. Excavate 210mm	71	m3	£3.76	£4.52	£321	Spon's 2018, pg. 409
600	Excavation for new verge	General excavation of acceptable Class 5A material. Excavate 150mm	21	m3	£3.76	£4.52	£95	Spon's 2018, pg. 409
600	Disposal off site of excavated material	Disposal of acceptable material Class 5A. Using 10t Capacity lorry; haul distance for 1km = £4.34. £2.17 per further Km haul. Assumed 10km haul distance.	66	m3	£27.12	£32.57	£2,150	Spon's 2018, pg. 411
600	Top soiling	Top soilling 150mm thick to surface	21	m2	£7.17	£8.61	£181	Spon's 2017, pg. 418
600	Allowance for unmeasured items		20%	%	£2,791.39		£558	N/A
700	**Series 700 - Pavements**							
700	Cold Milling	50mm deep; scarifying surface		m2	£19.77	£23.75	£0	Spon's 2018, pg. 431
700	Sub-Base	Granular Material DfT Type 1 - Sub-base in carriageway - 200mm	10	m3	£39.70	£47.68	£477	Spon's 2018, pg. 427
700	Base	Dense Bitumen Macadam - Base to DfT Clause 903 - 200mm	10	m2	£34.34	£41.25	£412	Spon's 2018, pg. 428
700	Binder Course	Dense Bitumen Macadam - Binder Course to DfT Clause 904 - 100mm	10	m2	£19.76	£23.73	£237	Spon's 2018, pg. 428
700	Surface Course	Dense Bitumen Macadam - Surface Course to DfT Clause 909 - 50mm	10	m2	£14.60	£17.54	£175	Spon's 2018, pg. 428
700	Allowance for unmeasured items		20%	%	£1,302.00		£260	N/A
1100	**Series 1100 - Kerbs, Footways and paved areas**							
1100	Foundations to kerbs	300x150mm - Mass concrete	75	m	£5.90	£7.09	£531	Spon's 2018, pg. 433
1100	Kerbs	150x305mm - Straight or curved exceeding 12m radius	75	m	£23.82	£28.61	£2,146	Spon's 2017, pg. 433
1100	Edge Kerbs	150x50mm - Straight or curved exceeding 12m radius		m	£6.24	£7.49	£0	Spon's 2017, pg. 433
1100	Drop kerbs	150mm x 305mm kerb - incl pedestrian island drop kerb		m	£30.20	£36.27	£0	Spon's 2017, pg. 433
1100	Footway Sub-base	150mm - Thick hardcore	71	m2	£5.71	£6.86	£487	Spon's 2017, pg. 436
1100	Footway - Paved Area	Bitumen macadam surfacing. 40mm binder course + 20mm surface course	71	m2	£23.22	£27.89	£1,980	Spon's 2017, pg. 437
	Cobble Paving	Bedding on 25mm cement mortar; filling joints; excluding subbase	33	m2	£51.04	£61.30	£2,011	Spon's 2018, pg. 317
1100	Allowance for unmeasured items		20%	%	£7,155.19		£1,431	N/A
1200	**Series 1200 - Traffic Signs/Road Markings**							
1200	Give Way	200m wide with 0.6m line and 0.3m gap	61	m	£1.71	£2.05	£125	Spon's 2018, pg. 443
1200	8m long double headed arrow			nr	£73.43	£88.20	£0	Spon's 2018, pg.443
1200	4m long straight or turning arrow			nr	£28.94	£34.76	£0	Spon's 2018, pg.443
1200	Triangles in reflectorized white	3.75m high		nr	£18.32	£22.00	£0	Spon's 2018, pg.443
1200	Ancillary line in reflectorized white	200mm in hatched areas		m	£1.71	£2.05	£0	Spon's 2018, pg.443
1200	Intermittent line in reflectorised white	100mm wide	405	m	£0.99	£1.19	£482	Spon's 2018, pg.443
1200	Continuous line in reflectorized white	150mm wide		m	£1.48	£1.78	£0	Spon's 2018, pg.443
	100mmx100mm square bi directional reflecting road stud with amber corner reflectors			nr	£8.87	£10.65	£0	Spon's 2018, pg. 444
	Signal Pedestal			nr	£51.18	£61.47	£0	Spon's 2018, pg. 444
	Loop dectector unit pedestal			nr	£23.19	£27.85	£0	Spon's 2018, pg. 444
	Excavate trench for traffic signal cable, depth ne 1.5m;supports, backfilling 450mm wide			m	£17.06	£20.49	£0	Spon's 2018, pg. 444
	Controller Unit Box			nr	£52.18	£62.67	£0	Spon's 2018, pg. 444
	Saw cutting grooves in pavement for dectector loops and feeder cables, with hot bitumen sealant after installation			m	£25.02	£30.05	£0	Spon's 2018, pg. 444
	traffic signs	1200mm x 400mm		nr	£62.57	£75.15	£0	Spon's 2018, pg. 317
	Relecting Road Studs	100mm x 100mm	94	nr	£7.17	£8.61	£810	Spons's 2018 pg, 321
	Surface markings; reflectorised white	letters or numerals; 1.6m high	18					Spon's 2018 pg. 319
	Surface markings; reflectorised white	letters or numerals; 3.75m high		nr	£22.06	£26.50	£0	Spon's 2018, pg. 319
	Cycle symbol markings-large		2		£150.00	£180.17	£360	Taken from NB spreadsheet
1200	Arrows in reflectorised white 4.0m long straight or turning	small arrows	5	nr	£27.58	£33.13	£166	Spon's 2018 pg. 319
1200	Allowance for unmeasured items		20%	%	£1,942.36		£388	N/A
				SUB TOTAL			£18,875	
		CONTINGENCY					£0.00	
				Overall Total			£18,875	

PROJECT: 40820 Manston
Wood: Junction 16

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No allowance has been included for VAT
No allowance has been included for resurfacing or carriageway repair or improvement works
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No allowance has been included for Traffic Regulation Orders (TRO) and any associated TRO consultation

No allowance has been included for upgrades to existing sewerage system (drainage assumed connected to existing system)

No allowance has been included for any structures (retaining walls, culverts etc.)
No allowance has been included for new or improved levels of street lighting

CAPEX ESTIMATE GRAND SUMMARY

SERIES	DESCRIPTION		Junction 16	
			35%	
100	Preliminaries, including restricted working hours			£54,427.85
200	Site Clearance			£2,756
600	Earthworks			£141
700	Pavements			£0
1100	Kerbs, Footways and Paved Areas			£1,913
1200	Traffic Signs and Road Markings			£150,699
	Construction Cost Sub-Total		**£209,936**	
	Project On-Costs	36.0%	**£75,577**	
	Site Investigation	6.0%		£12,596
	Concept Design	3.0%		£6,298
	Design & Planning	5.0%		£10,497
	Publicity	6.0%		£12,596
	Compensation	0.0%		£0
	Legal	7.0%		£14,696
	CDM (now included in design)	2.0%		£4,199
	Site Supervision	3.0%		£6,298
	Project Management	2.0%		£4,199
	Risk - General	2.0%		£4,199
	Scheme Optimism Bias	44.0%	**£92,372**	
	CAPEX SUB-TOTAL		**£377,885**	
	CONTINGENCY	**10%**	**£37,788.48**	
CAPEX TOTAL (EXCLUDING VAT)			**£415,673**	
EST. ACCURACY LOWER LIMIT	**-**	**15%**	**£353,000**	
EST. ACCURACY UPPER LIMIT	**+**	**30%**	**£540,000**	

Title: **Wood: Junction 16**
Drawing: 38199-Lon311

Notes:

Based on estimated sizing

Cost estimate excludes the following:
1) New Drainage, or diversion of existing
2) Street lighting, illuminated signage, road signage
3) Third party land costs
4) No new or relocation of statutory utilities
5) Landscaping

Base Date Spons 2018	2Q17	317
Current	3Q2018	315
Spons 2018 update		0.99
Location Factor	BCIS	1.15

Estimate Base Date	4Q19	329
Inflation Adjustment		1.04

Indicative Highway Engineering cost

Series	Item Description	Assumptions	Quantity	Unit	Rate	Rate (+uplift)	Price	Comment
200	Series 200 - Site Clearance							
200	Site Clearance	General Site Clearance - Open Field Site	1	ha	£1,923.92	£2,296.26	£2,296	Spon's 2018 Pg. 385
200	Kerb removal	Take up or take down & set aside for re-use/tip	-	m	£4.94	£5.90	£0	Spon's 2018 Pg. 386
200	Allowance for unmeasured items		20%	%	£2,296.26		£459	N/A
600	Series 600 - Earthworks							
600	Excavation for new carriageway	General excavation of acceptable Class 5A material. Excavate 550mm		m3	£3.76	£4.52	£0	Spon's 2018, pg. 409
600	Excavation for new footway	General excavation of acceptable Class 5A material. Excavate 210mm	26	m3	£3.76	£4.52	£117	Spon's 2018, pg. 409
600	Excavation for new verge	General excavation of acceptable Class 5A material. Excavate 150mm		m3	£3.76	£4.52	£0	Spon's 2018, pg. 409
600	Disposal off site of excavated material	Disposal of acceptable material Class 5A. Using 10t Capacity lorry; haul distance for 1km = £4.34. £2.17 per further Km haul. Assumed 10km haul distance.		m3	£27.12	£32.57	£0	Spon's 2018, pg. 411
600	Top soiling	Top soilling 150mm thick to surface		m2	£7.17	£8.61	£0	Spon's 2017, pg. 418
600	Allowance for unmeasured items		20%	%	£117.42		£23	N/A
700	Series 700 - Pavements							
700	Cold Milling	50mm deep; scarifying surface		m2	£19.77	£23.75	£0	Spon's 2018, pg. 431
700	Sub-Base	Granular Material DfT Type 1 - Sub-base in carriageway - 200mm		m3	£39.70	£47.68	£0	Spon's 2018, pg. 427
700	Base	Dense Bitumen Macadam - Base to DfT Clause 903 - 200mm		m2	£34.34	£41.25	£0	Spon's 2018, pg. 428
700	Binder Course	Dense Bitumen Macadam - Binder Course to DfT Clause 904 - 100mm		m2	£19.76	£23.73	£0	Spon's 2018, pg. 428
700	Surface Course	Dense Bitumen Macadam - Surface Course to DfT Clause 909 - 50mm		m2	£14.60	£17.54	£0	Spon's 2018, pg. 428
700	Allowance for unmeasured items		20%	%	£0.00		£0	N/A
1100	Series 1100 - Kerbs, Footways and paved areas							
1100	Foundations to kerbs	300x150mm - Mass concrete		m	£5.90	£7.09	£0	Spon's 2018, pg. 433
1100	Kerbs	150x305mm - Straight or curved exceeding 12m radius		m	£23.82	£28.61	£0	Spon's 2017, pg. 433
1100	Edge Kerbs	150x50mm - Straight or curved exceeding 12m radius		m	£6.24	£7.49	£0	Spon's 2017, pg. 433
1100	Drop kerbs	150mm x 305mm kerb - incl pedestrian island drop kerb		m	£30.20	£36.27	£0	Spon's 2017, pg. 433
1100	Footway Sub-base	150mm - Thick hardcore		m2	£5.71	£6.86	£0	Spon's 2017, pg. 436
1100	Footway - Paved Area	Bitumen macadam surfacing. 40mm binder course + 20mm surface course		m2	£23.22	£27.89	£0	Spon's 2017, pg. 437
	Cobble Paving	Bedding on 25mm cement mortar; filling joints; excluding subbase	26	m2	£51.04	£61.30	£1,594	Spon's 2018, pg. 317
1100	Allowance for unmeasured items		20%	%	£1,593.92		£319	N/A
1200	Series 1200 - Traffic Signs/Road Markings							
1200	Give Way	200m wide with 0.6m line and 0.3m gap		m	£1.71	£2.05	£0	Spon's 2018, pg. 443
1200	8m long double headed arrow			nr	£73.43	£88.20	£0	Spon's 2018, pg.443
1200	4m long straight or turning arrow		2	nr	£28.94	£34.76	£70	Spon's 2018, pg.443
1200	Triangles in reflectorized white	3.75m high		nr	£18.32	£22.00	£0	Spon's 2018, pg.443
1200	Ancillary line in reflectorized white	200mm in hatched areas		m	£1.71	£2.05	£0	Spon's 2018, pg.443
1200	Intermittent line in reflectorised white	100mm wide	74	m	£0.99	£1.19	£88	Spon's 2018, pg.443
1200	Continuous line in reflectorized white	150mm wide	17	m	£1.48	£1.78	£30	Spon's 2018, pg.443
	100mmx100mm square bi directional reflecting road stud with amber corner reflectors			nr	£8.87	£10.65	£0	Spon's 2018, pg. 444
	Traffic Signal Installation		1	nr	£100,000.00	£120,111.11	£120,111	
	traffic signs	1200mm x 400mm	3	nr	£62.57	£75.15	£225	Spon's 2018, pg. 317
	Relecting Road Studs	100mm x 100mm	52	nr	£7.17	£8.61	£448	Spons's 2018 pg, 321
	Surface markings; reflectorised white	letters or numerals; 3.75m high	174	nr	£22.06	£26.50	£4,610	Spon's 2018, pg. 319
1200	Allowance for unmeasured items		20%	%	£125,582.52		£25,117	N/A
					SUB TOTAL		£155,508	
		CONTINGENCY					£0.00	
					Overall Total		£155,508	

PROJECT: 40820 Manston
Wood: Junction 17

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No allowance has been included for resurfacing or carriageway repair or improvement works
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No allowance has been included for upgrades to existing sewerage system (drainage assumed connected to existing system)

No allowance has been included for any structures (retaining walls, culverts etc.)
No allowance has been included for new or improved levels of street lighting

CAPEX ESTIMATE GRAND SUMMARY

SERIES	DESCRIPTION		Junction 17	
			35%	
100	Preliminaries, including restricted working hours			£6,985.41
200	Site Clearance			£2,510
600	Earthworks			£269
700	Pavements			£15,269
1100	Kerbs, Footways and Paved Areas			£1,847
1200	Traffic Signs and Road Markings			£64
	Construction Cost Sub-Total		**£26,944**	
	Project On-Costs	**36.0%**	**£9,700**	
	Site Investigation	6.0%		£1,617
	Concept Design	3.0%		£808
	Design & Planning	5.0%		£1,347
	Publicity	6.0%		£1,617
	Compensation	0.0%		£0
	Legal	7.0%		£1,886
	CDM (now included in design)	2.0%		£539
	Site Supervision	3.0%		£808
	Project Management	2.0%		£539
	Risk - General	2.0%		£539
	Scheme Optimism Bias	44.0%	**£11,855**	
	CAPEX SUB-TOTAL		**£48,499**	
	CONTINGENCY	**10%**	**£4,849.87**	
	CAPEX TOTAL (EXCLUDING VAT)		**£53,349**	
	EST. ACCURACY LOWER LIMIT -	**15%**	**£45,000**	
	EST. ACCURACY UPPER LIMIT +	**30%**	**£69,000**	

Title: Wood: Junction 17

Drawing: R:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Infrastructure costings\Off-site mitigation\OFFISTE COSTING WORK MAY 19

Notes:

Based on estimated sizing

Cost estimate excludes the following:
1) New Drainage, or diversion of existing
2) Street lighting, illuminated signage, road signage
3) Third party land costs
4) No new or relocation of statutory utilities
5) Landscaping

Base Date Spons 2018	2Q17	317
Current	3Q2018	315
Spons 2018 update		0.99
Location Factor	BCIS	1.15

Estimate Base Date	4Q19	329
Inflation Adjustment		1.04

Indicative Highway Engineering cost

Series	Item Description	Assumptions	Quantity	Unit	Rate	Rate (+uplift)	Price	Comment
200	**Series 200 - Site Clearance**							
200	Site Clearance	General Site Clearance - Open Field Site	1	ha	£1,923.92	£2,296.26	£1,837	Spon's 2018 Pg. 385
200	Kerb removal	Take up or take down & set aside for re-use/tip	43	m	£4.94	£5.90	£254	Spon's 2018 Pg. 386
200	Allowance for unmeasured items		20%	%	£2,091.48		£418	N/A
600	**Series 600 - Earthworks**							
600	Excavation for new carriageway	General excavation of acceptable Class 5A material. Excavate 550mm	6	m3	£3.76	£4.52	£27	Spon's 2018, pg. 409
600	Excavation for new footway	General excavation of acceptable Class 5A material. Excavate 210mm		m3	£3.76	£4.52	£0	Spon's 2018, pg. 409
600	Excavation for new verge	General excavation of acceptable Class 5A material. Excavate 150mm		m3	£3.76	£4.52	£0	Spon's 2018, pg. 409
600	Disposal off site of excavated material	Disposal of acceptable material Class 5A. Using 10t Capacity lorry; haul distance for 1km = £4.34. £2.17 per further Km haul. Assumed 10km haul distance.	6	m3	£27.12	£32.57	£197	Spon's 2018, pg. 411
600	Top soiling	Top soilling 150mm thick to surface		m2	£7.17	£8.61	£0	Spon's 2017, pg. 418
600	Allowance for unmeasured items		20%	%	£223.95		£45	N/A
700	**Series 700 - Pavements**							
700	Cold Milling	50mm deep; scarifying surface	279	m2	£19.77	£23.75	£6,627	Spon's 2018, pg. 431
700	Sub-Base	Granular Material DfT Type 1 - Sub-base in carriageway - 200mm	2	m3	£39.70	£47.68	£105	Spon's 2018, pg. 427
700	Base	Dense Bitumen Macadam - Base to DfT Clause 903 - 200mm	11	m2	£34.34	£41.25	£453	Spon's 2018, pg. 428
700	Binder Course	Dense Bitumen Macadam - Binder Course to DfT Clause 904 - 100mm	11	m2	£19.76	£23.73	£261	Spon's 2018, pg. 428
700	Surface Course	Dense Bitumen Macadam - Surface Course to DfT Clause 909 - 50mm	301	m2	£14.60	£17.54	£5,279	Spon's 2018, pg. 428
700	Allowance for unmeasured items		20%	%	£12,724.11		£2,545	N/A
1100	**Series 1100 - Kerbs, Footways and paved areas**							
1100	Foundations to kerbs	300x150mm - Mass concrete	43	m	£5.90	£7.09	£306	Spon's 2018, pg. 433
1100	Kerbs	150x305mm - Straight or curved exceeding 12m radius	43	m	£23.82	£28.61	£1,234	Spon's 2017, pg. 433
1100	Edge Kerbs	150x50mm - Straight or curved exceeding 12m radius		m	£6.24	£7.49	£0	Spon's 2017, pg. 433
1100	Drop kerbs	150mm x 305mm kerb - incl pedestrian island drop kerb		m	£30.20	£36.27	£0	Spon's 2017, pg. 433
1100	Footway Sub-base	150mm - Thick hardcore		m2	£5.71	£6.86	£0	Spon's 2017, pg. 436
1100	Footway - Paved Area	Bitumen macadam surfacing. 40mm binder course + 20mm surface course		m2	£23.22	£27.89	£0	Spon's 2017, pg. 437
	Cobble Paving	Bedding on 25mm cement mortar; filling joints; excluding subbase		m2	£51.04	£61.30	£0	Spon's 2018, pg. 317
1100	Allowance for unmeasured items		20%	%	£1,539.26		£308	N/A
1200	**Series 1200 - Traffic Signs/Road Markings**							
1200	Give Way	200m wide with 0.6m line and 0.3m gap	9	m	£1.71	£2.05	£17	Spon's 2018, pg. 443
1200	8m long double headed arrow			nr	£73.43	£88.20	£0	Spon's 2018, pg.443
1200	4m long straight or turning arrow			nr	£28.94	£34.76	£0	Spon's 2018, pg.443
1200	Triangles in reflectorized white	3.75m high		nr	£18.32	£22.00	£0	Spon's 2018, pg.443
1200	Ancillary line in reflectorized white	200mm in hatched areas		m	£1.71	£2.05	£0	Spon's 2018, pg.443
1200	Intermittent line in reflectorised white	100mm wide	30	m	£0.99	£1.19	£36	Spon's 2018, pg.443
1200	Continuous line in reflectorized white	150mm wide		m	£1.48	£1.78	£0	Spon's 2018, pg.443
	100mmx100mm square bi directional reflecting road stud with amber corner reflectors			nr	£8.87	£10.65	£0	Spon's 2018, pg. 444
	Signal Pedestal			nr	£51.18	£61.47	£0	Spon's 2018, pg. 444
	Loop dectector unit pedestal			nr	£23.19	£27.85	£0	Spon's 2018, pg. 444
	Excavate trench for traffic signal cable, depth ne 1.5m;supports, backfilling 450mm wide			m	£17.06	£20.49	£0	Spon's 2018, pg. 444
	Controller Unit Box			nr	£52.18	£62.67	£0	Spon's 2018, pg. 444
	Saw cutting grooves in pavement for dectector loops and feeder cables, with hot bitumen sealant after installation			m	£25.02	£30.05	£0	Spon's 2018, pg. 444
	traffic signs	1200mm x 400mm		nr	£62.57	£75.15	£0	Spon's 2018, pg. 317
	Relecting Road Studs	100mm x 100mm		nr	£7.17	£8.61	£0	Spons's 2018 pg, 321
	Surface markings; reflectorised white	letters or numerals; 1.6m high						Spon's 2018 pg. 319
	Surface markings; reflectorised white	letters or numerals; 3.75m high		nr	£22.06	£26.50	£0	Spon's 2018, pg. 319
	Cycle symbol markings-large				£150.00	£180.17	£0	Taken from NB spreadsheet
1200	Arrows in reflectorised white 4.0m long straight or turning	small arrows		nr	£27.58	£33.13	£0	Spon's 2018 pg. 319
1200	Allowance for unmeasured items		20%	%	£53.13		£11	N/A
					SUB TOTAL		£19,958	
		CONTINGENCY					£0.00	
					Overall Total		£19,958	

Appendix 2

Mitigation Trigger Points

Manston Airport Development Traffic at Mitigation Junctions - Years 2, 5, 10, 15, 20

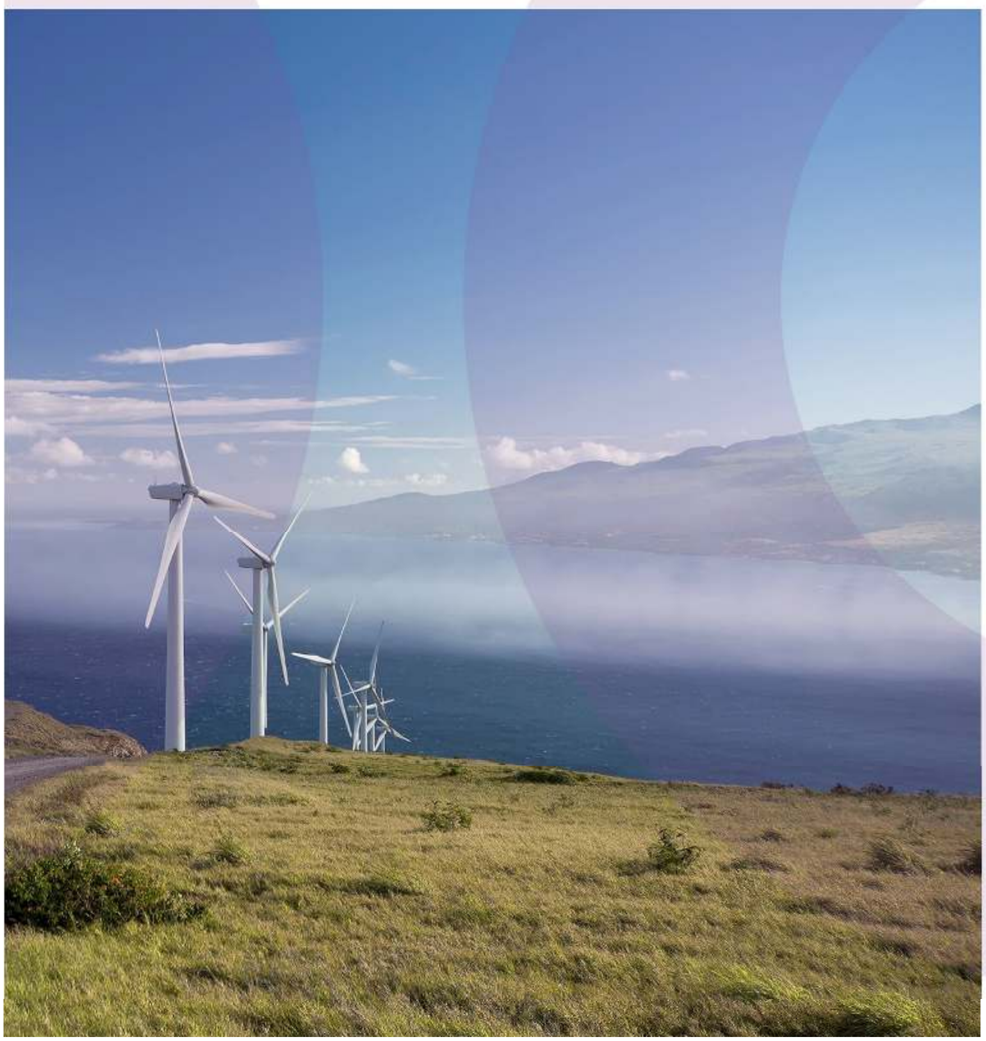
		AM Peak								PM Peak							
		Baseline Traffic	Development Traffic						% Increase	Baseline Traffic	Development Traffic						% Increase
Junction	Mitigation Description	Growthed Counts 2039 (TOTAL)	% Dev flows (Y20)	Yr 2 2021	Y5 2024	Y10 2029	Y15 2034	Y20 2039	Counts	Growthed Counts 2039	% Dev flows (Y20)	Yr 2	Y5	Y10	Y15	Y20	Counts
				128	533	623	698	789	2039			128	442	517	583	673	2039
J1	Minor widening on Arms	**3671**	26.0%	27	100	119	135	155	4%	**3707**	21.7%	28	96	112	126	146	4%
J2	Signalisation of Roundabout	4870	26.0%	27	100	119	135	155	3.2%	4881	21.7%	28	96	112	126	146	3%
J4	Signalisation of Roundabout	4282	22.2%	17	98	111	120	132	3.1%	4464	16.2%	18	78	89	97	109	2%
J6	Signalisation of Roundabout	3353	19.7%	14	88	100	107	117	3.5%	3719	14.1%	15	69	78	85	95	3%
J7	New Advanced Signs and Whitelining	4516	19.3%	14	87	98	105	115	2.5%	4780	13.8%	14	68	76	83	93	2%
J10	Minor widening and white lining	1313	15.3%	15	60	70	79	91	7%	1369	11.9%	16	51	60	69	80	6%
J13	Provision of a new three arm signalised junction with pedestrian crossing facilities linked to the signalised junction proposals for the main airport terminal access	1272	75.0%	76	292	344	389	446	35%	1237	56.0%	74	242	285	325	377	30%
J15	Provision of new signal head locations, road markings and revised stage sequence operation	2254	15.0%	15	58	69	77	89	4%	2406	11.0%	15	48	56	64	74	3%
J16	Provision of new stop line, road markings, signal head locations and revised stage sequence operation.	2576	5.2%	7	28	32	36	41	2%	2643	10.1%	13	45	52	59	68	3%
J17	New Signal Arrangement/Whitelining	2695	15.8%	16	61	72	82	94	3%	2999	11.4%	15	50	58	66	77	3%

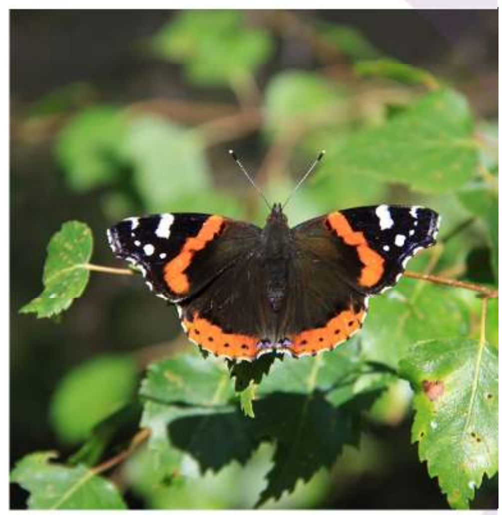
Development traffic flows above 100 vehicles or end state of the development trigger the mitigation

Appendix ISH7 – 43

Manston Airport DCO

Transport Assessment Update





Wood Environment & Infrastructure Solutions UK Limited – May 2019

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Contents

1. Introduction 5

1.1 Background 5
1.2 Format of TA Update 5

2. Traffic Generation 6

2.1 Introduction 6
2.2 TA Addendum Changes 6

3. Traffic Impact Assessment 8

3.1 Introduction 8
3.2 Junction Capacity Assessments 9
Junction 1: A256 / Sandwich Rd (Four-Arm Standard Roundabout) 10
Junction 2: A299 / A256 / Cottington Link Rd (Four-Arm Standard Roundabout) 11
Junction 3: A299 / Canterbury Rd / Hengist Way (Three-Arm Standard Roundabout) 11
Junction 4: A299 / B2190 (Four-Arm Standard Roundabout) 12
Junction 5: B2190 / Minster Rd (Three-Arm Standard Roundabout) 13
Junction 6 - A299 / Seamark Rd / A253 / Willetts Hill (five-arm standard roundabout) 13
Junction 7: A299 / A28 (Five-Arm Standard Roundabout) 14
Junction 8: A28 / Park Ln / Station Rd (Three-Arm Mini Roundabout and Left in/Left out Priority Junction) 15
Junction 9: Park Ln / Manston Rd / Acol Hill (Left in / left out simple priority) 16
Junction 10: Shottendane Rd / Manston Rd / Margate Hill (Four-Arm Staggered Junction) 17
Junction 11: Columbus Avenue / Spitfire Way (Three-Arm Standard Roundabout) 18
Junction 12: Manston Road / B2050 / Spitfire Way (Four-Arm Staggered Priority Junction) 18
Junction 13: Manston Court Road / B2050 (Three-Arm Priority Junction) 20
Junction 15: Manston Rd / Hartsdown Rd / Tivoli Rd / College Rd / Nash Rd (Five-Arm Signalised Junction) 20
Junction 16: Ramsgate Rd / College Rd / A254 / Beatrice Rd (Five-Arm Signalised Junction) 21
Junction 17: Ramsgate Road / Poorhole Lane / Margate Road / Star Lane (Four-Arm Standard Roundabout) 23
Junction 20: A256 / Manston Road (East/West) 23
Junction 21A: Canterbury Road / Haine Road (Three-Arm Standard Roundabout) and Junction 21B: A299 / A256 / Sandwich Rd / Canterbury Rd E (Four-Arm Signal Junction) 24
Junction 23: Star Lane Link / Star Lane (Three-Arm Priority Junction) 25
Junction 24: Star Lane Link / Nash Road (Four-Arm Standard Roundabout) 25
Junction 25: Tesco Access (Three-Arm Standard Roundabout) 26
Junction 26: Newington Road / Manston Road (Three-Arm Mini Roundabout) 26
Junction 27: Newington Road / High Street (Three-Arm Mini Roundabout) 27
3.3 Site Access Junctions 28
Cargo Facility Access 28
Northern Grass Area – Western Access 28
Northern Grass Area South Access 28
Passenger Terminal Access 29
3.4 Conclusions 29

Table 2.1 Overall development Traffic, AM peak –Year 20, Total Vehicles 6
Table 2.2 Overall development Traffic, PM peak –Year 20, Total Vehicles 6
Table 2.3 PM Peak – Additional Traffic at Junctions 7
Table 3.1 Junctions Assessed 8

Table 3.2 Junction 1 – 2039 Base and 2039 + Development - Peak Hour Modelling Results 10
Table 3.3 Junction 1 - Mitigation Results Summary – 2039 Base + Proposed Development – PM Peak 10
Table 3.4 Junction 2 – 2039 Base and 2039 + Development - Peak Hour Modelling Results 11
Table 3.5 Junction 2 - Mitigation Results Summary – 2039 Base + Proposed Development Revised Traffic – PM Peak 11
Table 3.6 Junction 3 – 2039 Base and 2039 + Development - Peak Hour Modelling Results 12
Table 3.7 Junction 4 – 2039 Base and 2039 + Development - Peak Hour Modelling Results 12
Table 3.8 Junction 4 - Mitigation Results Summary – 2039 Base + Proposed Development – PM peak 13
Table 3.9 Junction 5 – 2039 Base and 2039 + Development - Peak Hour Modelling Results 13
Table 3.10 Junction 6 – 2039 Base and 2039 + Development - Peak Hour Modelling Results 14
Table 3.11 Junction 6 Mitigation – 2039 Base and 2039 + Development - Peak Hour Modelling Results – PM peak – Revised Traffic Flows 14
Table 3.12 Junction 7 – 2039 Base and 2039 + Development - Peak Hour Modelling Results 15
Table 3.13 Junction 7 – 2039 Base and 2039 + Development - Peak Hour Modelling Results – PM Peak 15
Table 3.14 Junction 8a – 2039 Base and 2039 + Development - Peak Hour Modelling Results 16
Table 3.15 Junction 8b – 2039 Base and 2039 + Development - Peak Hour Modelling Results 16
Table 3.16 Junction 9 – 2039 Base and 2039 + Development - Peak Hour Modelling Results 17
Table 3.17 Junction 10 – 2039 Base and 2039 + Development - Peak Hour Modelling Results 17
Table 3.18 Junction 10 - Mitigation Results Summary – 2039 Base + Proposed Development – PM Peak 18
Table 3.19 Junction 11 – 2039 Base and 2039 + Development - Peak Hour Modelling Results 18
Table 3.20 Junction 12 – 2039 Base and 2039 + Development - Peak Hour Modelling Results 19
Table 3.21 Junction 12 – Mitigation Results Summary – 2039 Base + Proposed Development – PM Peak 19
Table 3.22 Junction 13 – 2039 Base and 2039 + Development - Peak Hour Modelling Results 20
Table 3.23 Junction 13 - Mitigation Results Summary – 2039 Base + Proposed Development – PM Peak 20
Table 3.24 Junction 15 – 2039 Base and 2039 + Development - Peak Hour Modelling Results 21
Table 3.25 Junction 15 – Mitigation Results Summary – 2039 Baseline + Proposed Development – PM Peak 21
Table 3.26 Junction 16 – 2039 Base and 2039 + Development - Peak Hour Modelling Results 22
Table 3.27 Junction 16 – Mitigation Results Summary – 2039 Baseline + Proposed Development – PM Peak 22
Table 3.28 Junction 17 – 2039 Base and 2039 + Development - Peak Hour Modelling Results 23
Table 3.29 Junction 17 – Mitigation Results Summary – 2039 Baseline + Proposed Development – PM Peak 23
Table 3.30 Junction 20 –2039 Revised Traffic + Development - Peak Hour Modelling Results 24
Table 3.31 Junction 21 – 2039 Revised Traffic + Development - Peak Hour Modelling Results 24
Table 3.32 Junction 23 – 2039 Base and 2039 + Development - Peak Hour Modelling Results 25
Table 3.33 Junction 24 – 2039 Base and 2039 + Development - Peak Hour Modelling Results 25
Table 3.34 Junction 25 – 2039 Base and 2039 + Development - Peak Hour Modelling Results 26
Table 3.35 Junction 26 – 2039 Base and 2039 + Development - Peak Hour Modelling Results 26
Table 3.36 Junction 27 – 2039 Base and 2039 + Development - Peak Hour Modelling Results 27
Table 3.37 Junction 28 – 2039 Base and 2039 + Development - Peak Hour Modelling Results 27
Table 3.38 Cargo Access – 2039 + Development – PM Peak 28
Table 3.39 Northern Grass – West Access – 2039 + Development – PM Peak 28
Table 3.40 Northern Grass – South Access – 2039 + Development – PM Peak 29
Table 3.41 Northern Grass – Passenger Terminal Access – 2039 + Development – PM Peak 29

Appendix A Traffic Flows
Appendix B Junction Models

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.

1.1.1 A Transport Assessment (TA) [APP-060, 061] was submitted in support of the DCO application. This was based on a spreadsheet model of traffic flows derived from traffic count surveys and the future year when the Proposed Development is expected to be fully operational. In addition to the existing 2017 baseline, two future year scenarios were tested:

- Scenario 1 – 2039 Baseline (with background traffic growth which took account of the draft Thanet Local Plan residential and employment growth); and
- Scenario 2 – 2039 Baseline + Proposed Development traffic.

1.1.2 Following the DCO submission, Wood undertook consultation with highways officers within Kent County Council (KCC) to scope the use of the KCC Thanet Strategic Traffic Model (TSTM) and as part of this, changes were made to traffic generation and minor changes to distribution. A TA Addendum was produced at Deadline 5 of the DCO Examination. The Addendum work demonstrated that the Proposed Development would not prejudice the delivery of draft the Thanet Local Plan and draft Thanet Transport Strategy which includes the Manston Haine Link.

1.1.3 As part of the scoping of the TA Addendum with KCC, two changes to the traffic generation methodology were agreed which affected the overall traffic generation.

1.1.4 The purpose of the TA Update is to assess and present the implications of the changes to the traffic generation based on the DCO TA spreadsheet model.

1.2 Format of TA Update

1.2.1 The TA Update includes the following:

- Chapter 2: Traffic Generation;
- Chapter 3: Traffic Impact Assessment

2. Traffic Generation

2.1 Introduction

2.1.1 This section provides a summary of the changes to traffic generation which have been considered within this assessment work.

2.2 TA Addendum Changes

2.2.1 As set out in Chapter 4 of the TA Addendum, based on post DCO submission discussions with KCC, modifications to the traffic generation assumptions were made which are summarised below:

- Passenger Arrivals prior to flight departures – changes were made 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%).
- Passenger Mode Share - 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.

2.2.2 A summary of the difference between the traffic generation presented in the original Transport Assessment (TA) (referred to as V6) and the Revised TA (V7) following the discussion between KCC and Wood (the Applicant) following the DCO submission is presented in Tables 2.1 and 2.2.

Table 2.1 Overall development Traffic, AM peak –Year 20, Total Vehicles

Traffic Gen version	Arrivals			Departures			Total Two-Way
	Lights	HGVs	Total	Lights	HGVs	Total	
V7	574	21	595	176	23	199	**789**
V6	573	21	594	173	23	196	**785**

Table 2.2 Overall development Traffic, PM peak –Year 20, Total Vehicles

Traffic Gen version	Arrivals			Departures			Total Two-Way
	Lights	HGVs	Total	Lights	HGVs	Total	
V7	134	24	158	487	28	515	**669**
V6	82	24	107	452	28	480	**582**

2.2.3 As shown in Table 2.1, there is no material change in traffic flow in the AM Peak between V6 and V7 and no further update is required. Table 2.2 shows an additional 87 vehicles in V7, an increase of 15%. Table 2.3 shows the resultant traffic flows at the junctions under assessment.

Table 2.3 PM Peak – Additional Traffic at Junctions

	% Dev flows (Y20)	Additional Traffic	Proportional Increase*
1 – A256/Sandwich Road;	21.8%	19	0.51%
2 – A256 / A299/Cottingham Link Road;	21.8%	19	0.39%
4 – A299 / B2190 (Minster Road)/B2190 (Tothill Street);	16.3%	14	0.32%
6 – A253 (Canterbury Road) / A299 / Willetts Hill/ Seamark Road;	14.2%	12	0.33%
7 – A299 / A28 (Canterbury Road)/ Potten Street Road;	13.9%	12	0.25%
10 – B2050 (Manston Road) / Shottendane Road / Margate Hill;	12.0%	10	0.76%
13 – B2050 (Manston Road) / Manston Court Road;	56.4%	49	3.96%
15 – B2052 (Heartsdown Road) / B2052 (Tivoli Road) / B2052 (College Road) / Nash Road / Empire Terrace / Manston Road (Coffin Corner);	11.1%	10	0.40%
16 – A254 (Ramsgate Road) / B2052 (College Road) / B2052 (Beatrice Road);	10.2%	9	0.33%
17 – A254 (Margate Road) / A254 (Ramsgate Road)/ Star Lane/ Poorhole Lane;	11.5%	10	0.33%
21A – A256 (Haine Road) / Canterbury Road West/ A256;	29.0%	25	0.73%
26 – B2050 (Manston Road)/B2014 (Newington Road);	5.2%	5	0.24%
27 – B2014 (Newington Road)/A255 (High Street)	5.2%	5	0.16%

* Based on DCO TA – growthed traffic counts

2.2.4 With the exception of Junction 13 Manston Road/Manston Court Road, the proportional increase is less than 1%. The impact at Junction 13 is less than 5% which is generally accepted as an average daily fluctuation in traffic flows.

2.2.5 Notwithstanding this, an assessment has been undertaken of the difference in the PM peak traffic flows which is set out in Section 3.

2.2.6 Further to this, it is noted that a review of the spreadsheet calculations identified two errors which resulted in an overestimation of overall traffic generation. With regards to the peak hour periods, there are the following changes

- In the AM peak hour there are 141 fewer trips than the revised traffic generation in the Revised TA; and
- In the PM peak hour there is a marginal increase of 11 vehicles compared to the revised traffic generation in the Revised TA.

2.2.7 The overestimation of the AM peak hour traffic is comparable to the traffic generation for departure and arrival flights which would affect the AM peak hour. On this basis, the DCO TA has been robust and has assessed a situation equivalent to departure/arrival flights affecting the AM peak hour.

2.2.8 This assessment of the PM peak hour has been based on the V7 traffic generation. The addition of 11 extra two-way trips is marginal and would not affect the overall outputs.

3. Traffic Impact Assessment

3.1 Introduction

3.1.1 The junction models have been re-run with the revised traffic generation data using the 2039 baseline traffic data presented within the DCO TA. **Table 3.1** sets out the junctions that have been assessed.

Table 3.1 Junctions Assessed

Junction No.	Junction Name	Assessment Required?	Commentary
1	A256/Sandwich Road	Yes	
2	A299/A256/Cottington Link Road	Yes	
3	Canterbury Road West/A299	Yes	
4	A299/B2190	Yes	
5	B2190 /Minster Road	Yes	
6	A299/Seamark Road/A253/Willetts Hill	Yes	
7	A299/A28	Yes	
8	A28/Park Lane/Station Road	Yes	
9	Park Lane/Manston Road/Acol Hill	Yes	
10	Shottendane Road/Manston Road/Acol Hill	Yes	
11	Columbus Avenue/Spitfire Way	Yes	
12	Manston Road/B2050/Spitfire Road	Yes	
13	Manston Court Road/B2050	Yes	
14	A28(Cantubury Road)/B2052 (George V Avenue)	No	Traffic Impact at the junction not sufficient to warrant assessment
15	Manston Road/Hartsdown Road/ Tivoli Road/College Road/Nash Road	Yes	
16	Ramsgate Road/College Road/A254/Beatrice Road	Yes	
17	Ramsgate Road/Poorhole Road/Margate Road/Star Lane	Yes	
18	Star Lane/Manston Court Road	Yes	
19	A256/New Cross Road	No	Traffic Impact at the junction not sufficient to warrant assessment
20	A256 (N/S)/Manston Road (E/W)	No	Based on Manston Green Junction Layout

Junction No.	Junction Name	Assessment Required?	Commentary
21a	Canterbury Road/Haine Road	Yes	Based on Manston Green Junction Layout
21b	A299/A256/Sandwich Road/Canterbury Road East	Yes	Based on Manston Green Junction Layout
22	Tivoli Road (B2052)/Beatrice Road	No	Traffic Impact at the junction not sufficient to warrant assessment
23	Star Lane/Star Lane Link	No	Traffic Impact at the junction not sufficient to warrant assessment
24	Star Lane Link/Nash Road	Yes	
25	Tescos Access	Yes	
26	Newington Road/Manston Road	Yes	
27	Newington Road/High Street	Yes	
28	Wilfred Road/A255/Grange Road	Yes	

3.2 Junction Capacity Assessments

3.2.1 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.

3.2.2 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%.

3.2.3 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.

3.2.4 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.

3.2.5 The revised Traffic Flows for the PM Peak are included in **Appendix A**.

3.2.6 The following sections set out the results from the junction modelling. The 2039 Baseline is included for reference, as are the results from the DCO TA based on the V6 traffic generation (referred to as 'original traffic'). The junction models are provided in **Appendix B**.

Junction 1: A256 / Sandwich Rd (Four-Arm Standard Roundabout)

3.2.7 **Table 3.2** sets out the results for the 2039 Baseline scenario and 2039 + Development scenario.

Table 3.2 Junction 1 – 2039 Base and 2039 + Development - Peak Hour Modelling Results

	2039 Baseline		2039 With Development – PM Peak			
	PM Peak		Original traffic		Revised traffic	
	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC
Sandwich Road	2	0.64	2	0.71	2 (+/- 0)	0.7
A256 (South)	12	0.93	13 (+1)	0.94	14 (+2)	0.94
Jutes Ln	24	21.77	26 (+2)	****	27 (+3)	****
A256 (North)	4	0.82	8 (+4)	0.89	7 (+3)	0.88

(Difference with 2039 baseline results are shown in brackets)

3.2.8 The results show that the junction is over capacity in the baseline, and with the inclusion of the Proposed Development, the queues increase. As per the DCO TA, it is considered that nil detriment mitigation is required.

3.2.9 As set out in the DCO TA, the proposed nil detriment improvement scheme involves minor localised widening on approach to the roundabout to maximise its capacity as shown in the Scheme Drawing is as set out in the DCO TA as Figure 7.1. This has not been subject to a Stage 1 Road Safety Audit (RSA) as the change is minor. The results are summarised in **Table 3.3**.

Table 3.3 Junction 1 - Mitigation Results Summary – 2039 Base + Proposed Development – PM Peak

	Original traffic		Revised traffic	
	Average Queue	RFC	Average Queue	RFC
Sandwich Road	2	0.63	2 (-)	0.62
A256 (S)	13 (+1)	0.94	14 (+2)	0.94
Jutes Lane	17 (-7)	3.38	19 (-5)	4.52
A256 (N)	6 (+2)	0.86	5 (+1)	0.85
Total Difference	-5		-2	

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

3.2.10 The results above indicate the mitigation scheme returns the junction to a performance better than the 2039 results and as such nil detriment has been achieved.

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

3.2.11 **Table 3.4** sets out the results for the 2039 Baseline scenario and 2039 + Development scenario.

Table 3.4 Junction 2 – 2039 Base and 2039 + Development - Peak Hour Modelling Results

	2039 Baseline	2039 With Development – PM Peak	
	PM Peak Average Queue	**Original Traffic Average Queue**	**Revised Traffic Average Queue**
A299 Hengist Way (E)	7	12 (+5)	12 (+5)
A256	182	204 (+22)	213 (+31)
Cottington Link Rd	59	58 (-1)	43 (-16)
A299 Hengist Way (N)	1	1 (+/-0)	1 (+/-0)

(Difference with 2039 baseline results are shown in brackets)

3.2.12 The results show that the junction is over capacity in the future baseline, with large queues on most arms, and with the inclusion of the Proposed Development, the queues increase. As per the DCO TA, it is considered that nil detriment mitigation is required.

3.2.13 The proposed mitigation scheme comprises widening of the approaches and the establishing this junction as a signal-controlled roundabout with two circulatory carriageway lanes and has been subject to a Road Safety Audit Stage 1, as included in **Appendix A**. **Table 3.5** sets out the results of the mitigation scheme assessment.

Table 3.5 Junction 2 - Mitigation Results Summary – 2039 Base + Proposed Development Revised Traffic – PM Peak

	Revised traffic and mitigation	
	Average Queue – AM Peak	**Average Queue – PM Peak**
A299 Hengist Way (E)	24 (-78)	15 (+8)
A256	24 (-73)	24 (-158)
Cottington Link Rd	0 (-89)	0 (-59)
A299 Hengist Way (N)	14 (+11)	3 (+2)

3.2.14 The results indicate that the proposed mitigation is considered to provide more than a nil detriment improvement scheme with significant queueing on the junction in both peaks than the 2039 base scenario. The impact of the development is therefore considered to be mitigated for with additional queue reductions and associated reduction in delays than in the 2039 Baseline

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

3.2.15 **Table 3.6** sets out the results for the 2039 Baseline scenario and 2039 + Development scenario.

Table 3.6 Junction 3 – 2039 Base and 2039 + Development - Peak Hour Modelling Results

	2039 Baseline		2039 With Development – PM Peak			
	PM Peak		Original traffic		Revised traffic	
	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC
Canterbury Rd	1	0.34	1 (+/- 0)	0.35	1 (+/- 0)	0.35
A299 Hengist Way (S)	4	0.81	4 (+/- 0)	0.81	4 (+/- 0)	0.81
A299 Hengist Way (W)	5	0.85	5 (+/- 0)	0.85	5 (+/- 0)	0.85

(Difference with 2039 Baseline results is shown in brackets)

3.2.16 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 mitigation works are required at this junction.

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

3.2.17 **Table 3.7** sets out the results for the 2039 Base scenario and 2039 + Development scenario.

Table 3.7 Junction 4 – 2039 Base and 2039 + Development - Peak Hour Modelling Results

	2039 Baseline		2039 With Development – PM Peak			
	PM Peak		Original traffic		Revised traffic	
	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC
Hengist Way (E)	143	1.21	155 (+12)	1.22	151 (+8)	1.22
Tothill Street	113	1.39	131 (+18)	1.45	125 (+12)	1.42
A299 (W)	168	1.18	188 (+20)	1.20	203 (+35)	1.21
B2190 (N)	163	1.3	270 (+107)	1.44	211 (+48)	1.36

(Difference with 2039 Baseline results is shown in brackets)

3.2.18 The results show that the junction is over capacity in the future baseline, with large queues on all arms, and with the inclusion of the Proposed Development, the queues increase. As per the DCO TA, it is considered that nil detriment mitigation is required.

3.2.19 The TA and the TA Addendum presented a scheme based on widening of the eastern arm to enable a flared approach, improved white lining on the gyratory, entry and exits arms and was subject to a Stage 1 RSA. Through the RSA process, a revised scheme was produced which includes signalisation of the roundabout and this has been presented as part of the evidence during the Examination process. The results from of the mitigation scheme are presented in **Table 3.8**.

Table 3.8 Junction 4 - Mitigation Results Summary – 2039 Base + Proposed Development – PM peak

	Revised traffic and mitigation	
	Average Queue – AM Peak	**Average Queue – PM Peak**
Hengist Way (E)	65 (-54)	27 (-116)
Tothill Street	61 (-33)	44 (-69)
A299 (W)	87 (-65)	89 (-79)
B2190 (N)	22 (-97)	35 (-128)

3.2.20 The results indicate that the proposed mitigation is considered to provide more than a nil detriment improvement scheme with significant queueing on the junction in both peaks than the 2039 base scenario.

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

3.2.21 **Table 3.9** sets out the results for the 2039 Baseline scenario and 2039 + Development scenario.

Table 3.9 Junction 5 – 2039 Base and 2039 + Development - Peak Hour Modelling Results

	2039 Baseline		2039 With Development – PM Peak			
	Original traffic		**Original traffic**		**Revised traffic**	
	Average Queue	**RFC**	**Average Queue**	**RFC**	**Average Queue**	**RFC**
B2190 (East)	1	0.45	1 (+/- 0)	0.51	1 (+/- 0)	0.49
B2190 (South)	1	0.43	1 (+/- 0)	0.46	1 (+/- 0)	0.47
Minster Rd	1	0.32	1 (+/- 0)	0.33	1 (+/- 0)	0.33

(Difference with 2039 baseline results shown in brackets)

3.2.22 With the inclusion of the Proposed Development flows, Junction 5 continues to operate within theoretical capacity with minimal queues and delays. It is concluded that no physical mitigation works are required at this junction.

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

3.2.23 **Table 3.10** sets out the results for the 2039 Baseline scenario and 2039 + Development scenario.

Table 3.10 Junction 6 – 2039 Base and 2039 + Development - Peak Hour Modelling Results

	2039 Baseline		2039 With Development – PM Peak			
	PM Peak		Original traffic		Revised traffic	
	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC
A299 (East)	32	1.00	78 (+46)	1.07	51 (+19)	1.04
Willetts Hill	0	0.11	0 (+/- 0)	0.11	0 (+/- 0)	0.11
A253 Canterbury Rd	66	1.23	74 (+8)	1.26	260 (+194)	1.92
A299 (North)	115	1.16	136 (+21)	1.19	201 (+86)	1.27
Seamark Rd	0	0.15	0 (+/- 0)	0.15	0 (+/- 0)	0.13

(Difference with 2039 baseline results shown in brackets)

3.2.24 The results show that the junction is over capacity in the future baseline, with large queues on all arms, and with the inclusion of the Proposed Development, the queues increase. As per the DCO TA, it is considered that nil detriment mitigation is required.

3.2.25 The TA and the TA Addendum presented a scheme based on minor physical works to enable a formal marking of the white lining both on approach and exit to the roundabout as well as the critical circulatory and was subject to a Stage 1 RSA. Through the RSA process, a revised scheme was produced which includes signalisation of the roundabout and this has been presented as part of the evidence during the Examination process.. The results of assessment of the mitigation scheme are presented in **Table 3.11**.

Table 3.11 Junction 6 Mitigation – 2039 Base and 2039 + Development - Peak Hour Modelling Results – PM peak – Revised Traffic Flows

	AM Peak - MMQ	PM Peak - MMQ
A299 (N) (1/1)	8	12 (-103)
A299 (N) (1/2)		
Seamark Road (2/1)	0	0 (-)
A299 (E)) (3/1)	14	2 14 (-18)
A299 (E) (3/2)		
Willetts Hill (S) (4/1)	1	0 (-)
A254 Canterbury Road (W) (5/2+5/1)	3	9 (-57)

3.2.26 The results indicate that the proposed mitigation is considered to provide a nil detriment improvement scheme in terms of queuing overall.

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

3.2.27 **Table 3.12** sets out the results for the 2039 Baseline scenario and 2039 + Development scenario.

Table 3.12 Junction 7 – 2039 Base and 2039 + Development - Peak Hour Modelling Results

	2039 Baseline	2039 With Development – PM Peak	
	PM Peak Average Queue	Original traffic Average Queue	Revised traffic Average Queue
A28 (East)	5	5 (+/- 0)	5 (-)
A299 (South)	25	52 (+27)	41 (+16)
Canterbury Rd	100	113 (+13)	114 (+14)
A299 (West)	179	197 (+18)	215 (+36)
Potten Street Rd	0	0 (+/- 0)	0 (-)

(Difference with 2039 baseline results shown in brackets)

3.2.28 The results show that the junction is over capacity in the future baseline, with large queues on most arms, and with the inclusion of the Proposed Development, the queues increase. As per the DCO TA, it is considered that nil detriment mitigation is required.

3.2.29 The TA and the TA Addendum presented a scheme based on of on carriageway markings and highway signage and did not include any physical change to the junction layout. The 2039 + Development flows were tested on this scheme and the results are presented in **Table 3.13**.

Table 3.13 Junction 7 – 2039 Base and 2039 + Development - Peak Hour Modelling Results – PM Peak

	Original traffic Average Queue	Revised traffic Average Queue
A28 (East)	5 (+/- 0)	3 (-2)
A299 (South)	5 (-20)	5 (-20)
Canterbury Rd	19 (-81)	15 (-85)
A299 (West)	227 (-46)	159 (-20)
Potten Street Rd	0 (+/- 0)	0 (+/- 0)

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

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

3.2.31 The results modelling for this junction is split into the separate elements, a three-arm roundabout (8a) and the priority junction (8b,) which together form Junction 8.

Junction 8a

3.2.32 **Table 3.14** sets out the results for the 2039 Baseline scenario and 2039 + Development scenario.

Table 3.14 Junction 8a – 2039 Base and 2039 + Development - Peak Hour Modelling Results

	2039 Baseline		2039 With Development – PM Peak			
	PM Peak		Original traffic		Revised traffic	
	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC
A28 East	49	1.08	50 (+1)	1.08	50 (+1)	1.08
A28 South	107	1.18	116 (+9)	1.20	114 (+7)	1.2
Station Rd	49	1.18	48 (-1)	1.17	49 (+/-0)	1.18

(Difference with 2039 baseline results shown in brackets)

3.2.33 The inclusion of the Proposed Development trips results in a maximum of seven extra vehicles on the Station Road arm in the AM peak and only seven on the A28 South. With such a minor impact from the development traffic no mitigation is proposed.

Junction 8b

3.2.34 **Table 3.15** sets out the results for the 2039 Base scenario and 2039 + Development scenario.

Table 3.15 Junction 8b – 2039 Base and 2039 + Development - Peak Hour Modelling Results

	2039 Baseline	2039 With Development – PM Peak	
	PM Peak Average Queue	Original traffic Average Queue	Revised traffic Average Queue
A28 North	0	0 (+/- 0)	0 (+/- 0)
Park Ln	57	70 (+13)	64 (+7)
A28 South	2	2 (+/- 0)	2 (+/- 0)

(Difference with 2039 baseline results shown in brackets)

3.2.35 The inclusion of the Proposed Development trips results in a maximum of seven extra vehicles on the Park Lane arm in the AM peak and only seven in the PM Peak. With such a minor impact from the development traffic no mitigation is proposed.

Junction 9: Park Ln / Manston Rd / Acol Hill (Left in / left out simple priority)

3.2.36 **Table 3.16** sets out the results for the 2039 Baseline scenario and 2039 + Development scenario.

Table 3.16 Junction 9 – 2039 Base and 2039 + Development - Peak Hour Modelling Results

	2039 Baseline		2039 With Development – PM Peak			
	PM Peak		Original traffic		Revised traffic	
	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC
Manston Road – all movement	1	0.42	1 (+/- 0)	0.50	1 (+/-0)	0.49
Acol Hill – all movement	0	0.06	0 (+/- 0)	0.06	0 (+/-0)	0.06

(Difference with 2039 baseline results shown in brackets)

3.2.37 With the inclusion of the Proposed Development flows, Junction 9 continues to operate within theoretical capacity with minimal queues and delays. It is concluded that no physical mitigation works are required at this junction.

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

3.2.38 **Table 3.17** sets out the results for the 2039 Baseline scenario and 2039 + Development scenario.

Table 3.17 Junction 10 – 2039 Base and 2039 + Development - Peak Hour Modelling Results

	2039 Baseline		2039 With Development – PM Peak			
	PM Peak		Original traffic		Revised traffic	
	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC
Margate Hill – all movement	53	1.17	59 (+ 6)	1.20	59 (+6)	1.2
Manston Rd (East) – all movement	1	0.47	2 (+ 1)	0.61	2 (+1)	0.59
Shottendale Rd to Manston Rd (East)	0	0.26	0 (+/- 0)	0.30	0 (+/- 0)	0.30
Shottendale Rd to Margate Hill & Manston Rd (West)	1	0.6	2 (+ 1)	0.66	2 (+1)	0.65

(Difference with 2039 baseline results shown in brackets)

3.2.39 The results show that the junction is over capacity in the future baseline, with large queues on most arms, and with the inclusion of the Proposed Development, the queues increase. As per the DCO TA, it is considered that nil detriment mitigation is required.

3.2.40 In order to add more capacity to the northern arm minor widening and a readjustment of the white lining is proposed to maximise the capacity. In addition, the southern arm is proposed to be widened to smooth the entry approach and maximise the effective capacity. The scheme design is unchanged from that presented in the DCO TA as Figure 7.6. This has not been subject to a Stage 1 RSA as the change is minor.

3.2.41 **Table 3.18** sets out the results of the mitigation scheme assessment.

Table 3.18 Junction 10 - Mitigation Results Summary – 2039 Base + Proposed Development – PM Peak

	Original traffic		Revised traffic	
	Average Queue	RFC	Average Queue	RFC
Margate Hill	52 (-1)	1.17	52	1.17
Manston Road East	2 (+1)	0.60	2	0.58
Shottendane Road to Manston East	0 (+/- 0)	0.30	0	0.30
Shottendane Road to Margate Hill	2 (+1)	0.63	2	0.62

3.2.42 The results show that the mitigation scheme results in nil detriment.

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

3.2.43 **Table 3.19** sets out the results for the 2039 Baseline scenario and 2039 + Development scenario.

Table 3.19 Junction 11 – 2039 Base and 2039 + Development - Peak Hour Modelling Results

	2039 Baseline		2039 With Development – PM Peak			
	PM Peak		Original traffic		Revised traffic	
	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC
Spitfire Way	1	0.51	2 (+ 1)	0.61	1 (+/-0)	0.57
B2190 Columbus Avenue West	0	0.22	0 (+/- 0)	0.25	0 (+/- 0)	0.26
B2190 Columbus Avenue North	0	0.19	0 (+/- 0)	0.20	0 (+/- 0)	0.20

(Difference with 2039 baseline results shown in brackets)

3.2.44 With the inclusion of the Proposed Development flows, Junction 9 continues to operate within theoretical capacity with minimal queues and delays. It is concluded that no physical mitigation works are required at this junction.

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

3.2.45 **Table 3.20** sets out the results for the 2039 Base scenario and 2039 + Development scenario.

Table 3.20 Junction 12 – 2039 Base and 2039 + Development - Peak Hour Modelling Results

	2039 Baseline		2039 With Development – PM Peak			
	PM Peak		Original traffic		Revised traffic	
	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC
Spitfire Way to B2050 (West)	3	1.37	5 (+ 2)	1.80	5 (+2)	1.81
Spitfire Way to B2050 (East) / Manston Road (North)	175	1.65	300 (+ 125)	2.12	314 (+139)	2.12
B2050 (East)	1	0.17	14 (+ 13)	0.86	8 (+7)	0.74
Manston Road (North) to B2050 (East)	11	1.56	125 (+ 114)	4.73	125 (+114)	4.54
Manston Road (North) to Spitfire Way / B2050 (West)	62	1.67	216 (+ 154)	4.77	214 (+152)	4.58
B2050 (West)	0	0.03	0 (+/- 0)	0.04	0 (+/-0)	0.04

(Difference with 2039 baseline results shown in brackets)

3.2.46 The results show that the junction is over capacity in the future baseline, with large queues on most arms, and with the inclusion of the Proposed Development, the queues increase. As per the DCO TA, it is considered that nil detriment mitigation is required.

3.2.47 The proposed mitigation scheme is in the form of a fully signalled junction with integrated pedestrian crossing facilities. The pedestrian facilities on the eastern and southern are signalled, whilst the northern and western arm benefit from courtesy crossings. This has been subject to a Stage 1 RSA, and this has been presented as part of the evidence during the Examination process. This junction is also part of the site design and is included in the Masterplan. The results of the junction model testing are set out in **Table 3.21**.

Table 3.21 Junction 12 – Mitigation Results Summary – 2039 Base + Proposed Development – PM Peak

	Original traffic		Revised traffic	
	MMQ	DoS	MMQ	DoS
Spitfire Way (1/1+1/2)	11 (-167)	71.3%	13 (-165)	88.8%
Manston Road East (B2050) (4/1+4/2)	12 (+11)	71.2%	15 (+14)	88.9%
Manston Road North (3/1)	14 (-59)	70.2%	6 (-67)	47.4%
Manston Road West B2050 (2/1)	12 (+12)	71.3%	6 (+5)	44.0%
Total Difference	-203		-213	

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

3.2.48 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.

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

3.2.49 **Table 3.22** sets out the results for the 2039 Baseline scenario and 2039 + Development scenario.

Table 3.22 Junction 13 – 2039 Base and 2039 + Development - Peak Hour Modelling Results

	2039 Baseline		2039 With Development – PM Peak			
	PM Peak		Original traffic		Revised traffic	
	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC
Manston Court Road	22	1.2	88 (+66)	2.63	85 (+63)	2.46
B2050	0	0.05	0 (+/- 0)	0.07	0 (+/- 0)	0.07

(Difference with 2039 baseline results shown in brackets)

3.2.50 The results show that the junction is over capacity in the future baseline, and with the inclusion of the Proposed Development, the queues increase significantly.

3.2.51 The mitigation proposed for this junction is to fully signalise junction and link it to the main airport access which is also proposed a signalised junction. The scheme design is unchanged from that presented in the DCO TA as Figure 7.8 and this has now had a RSA undertaken on it which has been presented as part of the evidence during the examination process.

3.2.52 **Table 3.23** sets out the results of the mitigation scheme assessment.

Table 3.23 Junction 13 - Mitigation Results Summary – 2039 Base + Proposed Development – PM Peak

	Original traffic		Revised traffic	
	MMQ	DoS	MMQ	DoS
Manston Court Road	7 (-15)	70.4%	8	74.8%
Manston Road West	5 (+5)	63.4%	3	62.3%
Manston Road East	11 (+11)	50.6%	12	51.5%

3.2.53 The results show that the mitigation scheme brings the junction performance back down to that for which nil detriment is achieved. Some arms do experience an increase in queuing, but this is because the B2050 has now been changed to an unrestricted carriageway to one with signals. Overall the levels of queuing and delay across the junction fall.

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

3.2.54 **Table 3.24** sets out the results for the 2039 Baseline scenario and 2039 + Development scenario.

Table 3.24 Junction 15 – 2039 Base and 2039 + Development - Peak Hour Modelling Results

	2039 Base PM Peak		2039 Base + Development – PM Peak			
			Original traffic		Revised traffic	
	MMQ	DoS	MMQ	DoS	MMQ	DoS
College Rd Lane 1 (2/1) College Rd Lane 2 (2/2)	105	119.4%	125 (+20)	125.4%	118 (+13)	122.9%
Nash Rd (2/1)	65	119.7%	73 (+8)	124.3%	73 (+8)	124.3%
Manston Rd Lane 1 (1/1) Manston Rd Lane 2 (1/2)	74	117.7%	96 (+22)	122.6%	98 (+24)	123.8%
Hartsdown Rd (3/1)	31	105.0%	37 (+6)	109.1%	37 (+6)	109.1%
PRC	-33.0%		-33.5%		-38.2%	

3.2.55 The results show that the junction is over capacity in the future baseline, with large queues on most arms, and with the inclusion of the Proposed Development, the queues increase. As per the DCO TA, it is considered that nil detriment mitigation is required.

3.2.56 The mitigation proposal is a new signal head and stage sequence, as well as new white lining, to maximise the capacity at this junction. The scheme drawing is unchanged from that presented in the DCO TA provided as Figure 7.9 and has not been subject to a Stage 1 RSA as the change is minor.

3.2.57 **Table 3.25** sets out the results of the mitigation scheme assessment.

Table 3.25 Junction 15 – Mitigation Results Summary – 2039 Baseline + Proposed Development – PM Peak

	Original traffic		Revised traffic	
	MMQ	DoS	MMQ	DoS
College Road – Lane 1 College Road – Lane 2	53 (-52)	104.0%	47 (-58)	102.3%
Manston Road – Lane 1 Manston Road Lane 2	18 (-56)	76.6%	17 (-57)	74.2%
Nash Road	10 (-55)	68.6%	38 (-27)	105.6%
Hartsdown Road	18 (-13)	91.5%	18 (-13)	91.5%
Total Difference	-148		-156	

3.2.58 The results show that the junction improvement results in a more than a nil detriment solution.

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

3.2.59 **Table 3.26** sets out the results for the 2039 Base scenario and 2039 + Development scenario.

Table 3.26 Junction 16 – 2039 Base and 2039 + Development - Peak Hour Modelling Results

	2039 Base		2039 Base + Development – PM Peak			
	PM Peak		AM Peak		PM Peak	
	MMQ	DoS	MMQ	DoS	MMQ	DoS
A254 (SB) Ramsgate Road (9/1) A254 (SB) Ramsgate Road (9/2)	20	71.0% 119.8%	20 (+/- 0)	71.0% 119.8%	20 (-)	71.0% 119.8%
College Road B2052 (WB) (6/1)	62	121.0%	65 (+3)	122.4%	65 (+3)	122.4%
A254 Ramsgate Road (NB) (1/1) A254 Ramsgate Road (NB) (1/2)	109	122.3%	109 (+/- 0)	122.3%	110 (+1)	122.3%
Beatrice Rd (4/1) Beatrice Rd (4/2)	92	122.3%	102 (+10)	124.0%	102 (+10)	124.0%
Slip to College Rd (5/1)	0	3.4%	0 (+/- 0)	3.5%	0	3.5%
PRC	-35.9%		-37.8%		-37.8%	

3.2.60 The results show that the junction is over capacity in the future baseline, with large queues on most arms, and with the inclusion of the Proposed Development, the queues increase. As per the DCO TA, it is considered that nil detriment mitigation is required.

3.2.61 The mitigation proposal utilises new stop lines, signal head and pedestrian crossings to enable a more efficient stage sequence to be operated. This scheme has been the subject of a Stage 1 RSA, as presented as part of the Examination process. **Table 3.27** sets out the results of the assessment.

Table 3.27 Junction 16 – Mitigation Results Summary – 2039 Baseline + Proposed Development – PM Peak

	Original traffic		Revised traffic	
	MMQ	DoS	MMQ	DoS
A254 (SB) Ramsgate Road (9/1) A254 (SB) Ramsgate Road (9/2)	12 (-8)	63.8% 63.8%	14	65.3% 98.9%
College Road B2052 (WB) (6/1)	44 (-18)	110.3	18	83.8%
A254 Ramsgate Road (NB) (1/1) A254 Ramsgate Road (NB) (1/2)	72 (-37)	110.3	66	107.1%
Beatrice Rd (4/1) Beatrice Rd (4/2)	63 (-29)	109.0	54	107.6%
Slip to College Road (5/1)	0 (+/- 0)	4.0	0	4.1%

3.2.62 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.

Junction 17: Ramsgate Road / Poorhole Lane / Margate Road / Star Lane (Four-Arm Standard Roundabout)

3.2.63 **Table 3.28** sets out the results for the 2039 Baseline scenario and 2039 + Development scenario.

Table 3.28 Junction 17 – 2039 Base and 2039 + Development - Peak Hour Modelling Results

	2039 Baseline	2039 With Development – PM Peak	
	PM Peak Average Queue	Original traffic Average Queue	Revised traffic Average Queue
Poorhole Lane	11	11 (0)	12 (+1)
Margate Road	83	83 (0)	87 (+4)
Star Lane	13	38 (+25)	36 (+23)
Ramsgate Road	73	84 (+11)	86 (+13)

(Difference with 2039 baseline results are shown in brackets)

3.2.64 The results show that the junction is over capacity in the future baseline, with large queues on most arms, and with the inclusion of the Proposed Development, the queues increase. As per the DCO TA, it is considered that nil detriment mitigation is required.

3.2.65 The proposed mitigation scheme at Junction 17 is limited in terms of options which can be delivered within the existing highways constraints. The proposed scheme is to provide minor widening and updated white lining to maximise the available capacity. The Scheme design is unchanged from the DCO TA which was Figure 7.11 and has not been subject to a Stage 1 RSA as the changes are minor. **Table 3.29** sets out the results of the mitigation scheme assessment.

Table 3.29 Junction 17 – Mitigation Results Summary – 2039 Baseline + Proposed Development – PM Peak

	Original traffic	Revised traffic
	Average Queue	Average Queue
Poorhole Lane	11 (+/- 0)	12 (+1)
Margate Road	64 (-19)	67 (-16)
Star Lane	22 (+9)	19 (+6)
Ramsgate Road	63 (-10)	61 (-12)
Total Difference	-20	-21

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

3.2.66 The junction is shown to operate with less queues with the mitigation measure in place than the existing layout in the growthed 2039 baseline and provides more than a nil detriment solution.

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

3.2.67 In the initial DCO TA the proposed committed scheme for the Manston Green Development was not taken into account. However, this has formed the basis for this assessment. This scheme results in the junction being converted from a two-element junction (a roundabout and priority junction) to one single large roundabout with a dedicated left turn slip lane from Manston Road

West to the A256 North. **Table 3.30** sets out the results for the 2039 Base scenario and 2039 + Development scenario for the revised traffic for the AM and PM Peak.

Table 3.30 Junction 20 –2039 Revised Traffic + Development - Peak Hour Modelling Results

	AM Peak		**PM Peak**	
	Average Queue	**RFC**	**Average Queue**	**RFC**
A256 (N)	3	0.72	7	0.88
Manston Road (E)	5	0.85	5	0.85
A256 (S)	0	0.06	0	0.07
Manston Road (W)	0	0.31	0	0.29

3.2.68 With the inclusion of the Proposed Development flows, Junction 20 using the layout proposed for the Manston Green development will operate within capacity thresholds.

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

3.2.69 In the initial DCO TA the proposed committed scheme for the Manston Green Development was not taken into account. However, this has formed the basis for this assessment. The scheme proposals are for the route though the Manston Green development to be the primary route north on the A256 corridor to Junction 20 and downgrading of the old Haine Road. **Table 3.31** sets out the results for the 2039 Base scenario and 2039 + Development scenario.

Table 3.31 Junction 21 – 2039 Revised Traffic + Development - Peak Hour Modelling Results

	AM Peak - MMQ	**PM Peak – MMQ**
A256 Lane 1 (5/1)	11.4	10.6
A256 Lane 2 (5/2)	10.0	9.7
Canterbury Road East (7/1)	7.3	14.5
Canterbury Road East (7/2)	7.3	14.5
Sandwich Road (3/1)	0.2	0.3
Hengist Way Lane 1 (1/1)	19.8	14.5
Hengist Way Lane 2 (1/2)	4.4	5.7
Hengst Way Lane 3 (1/3)	4.4	5.7
A256 Haine Road (13/1)	0.0	19.2
Canterbury Road West (14/1+14/2)	4.1	3.4
New Arm (19/1 + 19/2)	2.2	2.7
A256 Canterbury Road (6/1)	0.6	0.6
A256 Canterbury Road (6/2)	7.7	7.6

3.2.70 The results for junction 20 mitigation indicates that the queues are within acceptable limits at the junction.

Junction 23: Star Lane Link / Star Lane (Three-Arm Priority Junction)

3.2.71 **Table 3.32** sets out the results for the 2039 Base scenario and 2039 + Development scenario.

Table 3.32 Junction 23 – 2039 Base and 2039 + Development - Peak Hour Modelling Results

	2039 Baseline		2039 With Development – PM Peak			
	PM Peak		Original traffic		Revised traffic	
	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC
Star Lane West to Star Lane East	1	0.36	1 (+/- 0)	0.50	1	0.50
Star Lane West to Star Lane Link	1	0.41	1 (+/- 0)	0.45	1	0.46
Star Lane East - all movement	3	0.62	3 (+/- 0)	0.65	3	0.66

(Difference with 2039 committed trips is shown in brackets)

3.2.72 With the inclusion of the Proposed Development flows, Junction 24 continues to operate within theoretical capacity with minimal queues and delays. It is concluded that no physical mitigation works are required at this junction. The operation between the scenarios as a result of the development traffic is negligible.

Junction 24: Star Lane Link / Nash Road (Four-Arm Standard Roundabout)

3.2.73 **Table 3.33** sets out the results for the 2039 Baseline scenario and 2039 + Development scenario.

Table 3.33 Junction 24 – 2039 Base and 2039 + Development - Peak Hour Modelling Results

	2039 Baseline		2039 With Development – PM peak			
	PM Peak		Original traffic		Revised traffic	
	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC
Star Lane East	2	0.62	2 (+/- 0)	0.63	2	0.63
Nash Road South	1	0.32	1 (+/- 0)	0.32	1	0.32
Star Lane West	1	0.52	1 (+/- 0)	0.57	1	0.57
Nash Road North	2	0.68	2 (+/- 0)	0.70	2	0.70

(Difference with 2039 committed trips is shown in brackets)

3.2.74 With the inclusion of the Proposed Development flows, Junction 24 continues to operate within theoretical capacity with minimal queues and delays. It is concluded that no physical mitigation works are required at this junction. The operation between the scenarios as a result of the development traffic is negligible.

Junction 25: Tesco Access (Three-Arm Standard Roundabout)

3.2.75 **Table 3.34** sets out the results for the 2039 Base scenario and 2039 + Development scenario.

Table 3.34 Junction 25 – 2039 Base and 2039 + Development - Peak Hour Modelling Results

	2039 Baseline		2039 With Development – PM peak			
	PM Peak		Original traffic		Revised traffic	
	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC
B2050 Manston Road East	1	0.4	1 (+/- 0)	0.40	1 (+/-0)	0.4
Tesco Access	0	0.22	0 (+/- 0)	0.22	3 (+3)	0.22
B2050 Manston Road West	14	0.97	23 (+ 9)	1.02	21 (+7)	1.01

(Difference with 2039 committed trips is shown in brackets)

3.2.76 With the addition of the development traffic scenario traffic the operation of the junction continues to be at an over just over capacity situation as in the base 2039 scenario. However, in both peaks the increase in queue and delay is minimal and as such it is considered that no mitigation proposals are required.

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

3.2.77 **Table 3.35** sets out the results for the 2039 Baseline scenario and 2039 + Development scenario.

Table 3.35 Junction 26 – 2039 Base and 2039 + Development - Peak Hour Modelling Results

	2039 Baseline		2039 With Development – PM Peak			
	PM Peak		Original traffic		Revised traffic	
	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC
Newington Road North	71	1.26	74 (+3)	1.27	75 (+4)	1.27
Newington Road South	7	0.88	7 (+/- 0)	0.89	7 (+/-0)	0.89
Manston Road	123	1.43	156 (+33)	1.51	153 (+30)	1.5

(Difference with 2039 committed trips is shown in brackets)

3.2.78 The results show that the junction is over capacity in the future baseline, with large queues on most arms, and with the inclusion of the Proposed Development, the queues increase.

3.2.79 The DCO TA identified a scheme which comprised a signalised T junction. A Stage 1 RSA has been undertaken which identified issues with lane widths. Further consideration has been given to the need for an improvement scheme given the land constraints at the junction and the quantum of development traffic. On the basis that there are only 35 vehicles at the junction in the PM (and 45 vehicles based on R7 in the AM peak, or 38 vehicles based on the amended traffic generation), it is concluded that there is limited opportunity to improve the junction and the scale of development traffic does not result in a severe impact.

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

3.2.80 **Table 3.36** sets out the results for the 2039 Baseline scenario and 2039 + Development scenario.

Table 3.36 Junction 27 – 2039 Base and 2039 + Development - Peak Hour Modelling Results

	2039 Baseline		2039 With Development – PM Peak			
	PM Peak		Original traffic		Revised traffic	
	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC
Newington Road North	103	1.25	129 (+26)	1.30	126 (+23)	1.29
High Street East	87	1.17	85 (+2)	1.16	88 (+1)	1.17
High Street South	119	1.22	121 (+2)	1.22	123 (+4)	1.22

(Difference with 2039 committed trips is shown in brackets)

3.2.81 The results show that the junction is over capacity in the future baseline, with large queues on most arms, and with the inclusion of the Proposed Development, the queues increase.

3.2.82 The DCO TA identified a scheme which comprised minor road widening by the removal of existing splitter islands on the southern and western arm and additional lane markings. A Stage 1 RSA has been undertaken which identified issues with lane widths. Further consideration has been given to the need for an improvement scheme given the land constraints at the junction and the quantum of development traffic. On the basis that there are only 35 vehicles at the junction in the PM (and 45 vehicles based on R7 in the AM peak, or 38 vehicles based on the amended traffic generation), it is concluded that there is limited opportunity to improve the junction and the scale of development traffic does not result in a severe impactJunction 28: Wilfred Rd / A255 /Grange Rd (Four-Arm Signalised)

3.2.83 **Table 3.37** sets out the results for the 2039 Base scenario and 2039 + Development scenario.

Table 3.37 Junction 28 – 2039 Base and 2039 + Development - Peak Hour Modelling Results

	2039 Baseline		2039 With Development – PM Peak			
	PM Peak		Original traffic		Revised traffic	
	MMQ	DoS	MMQ	DoS	MMQ	DoS
Wilfred Rd	17	94.0%	20 (+3)	97.9%	20 (+3)	98.1%
A255 Park Rd	11	54.4%	11 (+/- 0)	53.7%	11 (+/-0)	53.8%
Grange Rd	7	88.0%	7 (+/- 0)	88.0%	7 (+/-0)	88.0%
A255 High Street	33	95.2%	36 (+3)	97.0%	35 (+2)	96.6%
PRC	-5.8%		-9.0%		-9.0%	

3.2.84 With the inclusion of the Proposed Development flows, Junction 9 continues to operate within theoretical capacity with minimal queues and delays. It is concluded that no physical mitigation works are required at this junction.

3.3 Site Access Junctions

Cargo Facility Access

3.3.1 The results of the junction assessment are shown in **Table 3.38**.

Table 3.38 Cargo Access – 2039 + Development – PM Peak

	Original traffic		Revised traffic	
	Average Queue	**RFC**	**Average Queue**	**RFC**
Spitfire Way Easy	1	0.44	1	0.40
Cargo Access	0	0.01	0	0.01
Spitfire Way West	1	0.32	1	0.34

3.3.2 The results in the table above indicate the junction operating with ample capacity

Northern Grass Area – Western Access

The proposals for the Northern Grass Area Western Access have not been amended since the DCO TA. The results of the junction reassessed with the revised traffic flows are presented in **Table 3.39.**

Table 3.39 Northern Grass – West Access – 2039 + Development – PM Peak

	Original traffic		Revised traffic	
	Average Queue	**RFC**	**Average Queue**	**RFC**
Manston Road N	0	0.28	0	0,28
Northern Grass Area	0	0.07	1	0.36
Manston Road S	0	0.06	0	0.06

3.3.3 The results in the table above indicate the junction operates with ample capacity.

Northern Grass Area South Access

3.3.4 The proposals for the Northern Grass Area Southern Access have not been amended since the DCO TA. The results of the junction reassessed with the revised traffic flows are presented in **Table 3.40**.

Table 3.40 Northern Grass – South Access – 2039 + Development – PM Peak

	Original traffic		Revised traffic	
	MMQ	**DoS**	**MMQ**	**DoS**
NGA south (2/1)	5	37.1%	5.5	38.30%
Manston Road West 3/1	19	69.4%	21.3	74.90%
Manston Road East 6/1	2	38.5%	0.8	35.60%
Manston Road East 6/2	0.3	28.20%	0.3	28.20%

3.3.5 This indicates that junction would operate with some spare capacity in the AM and PM Peaks.

Passenger Terminal Access

3.3.6 The proposals for the Passenger Terminal Access have not been amended since the DCO TA. The results of the junction reassessed with the revised traffic flows are presented in **Table 3.41**.

Table 3.41 Northern Grass – Passenger Terminal Access – 2039 + Development – PM Peak

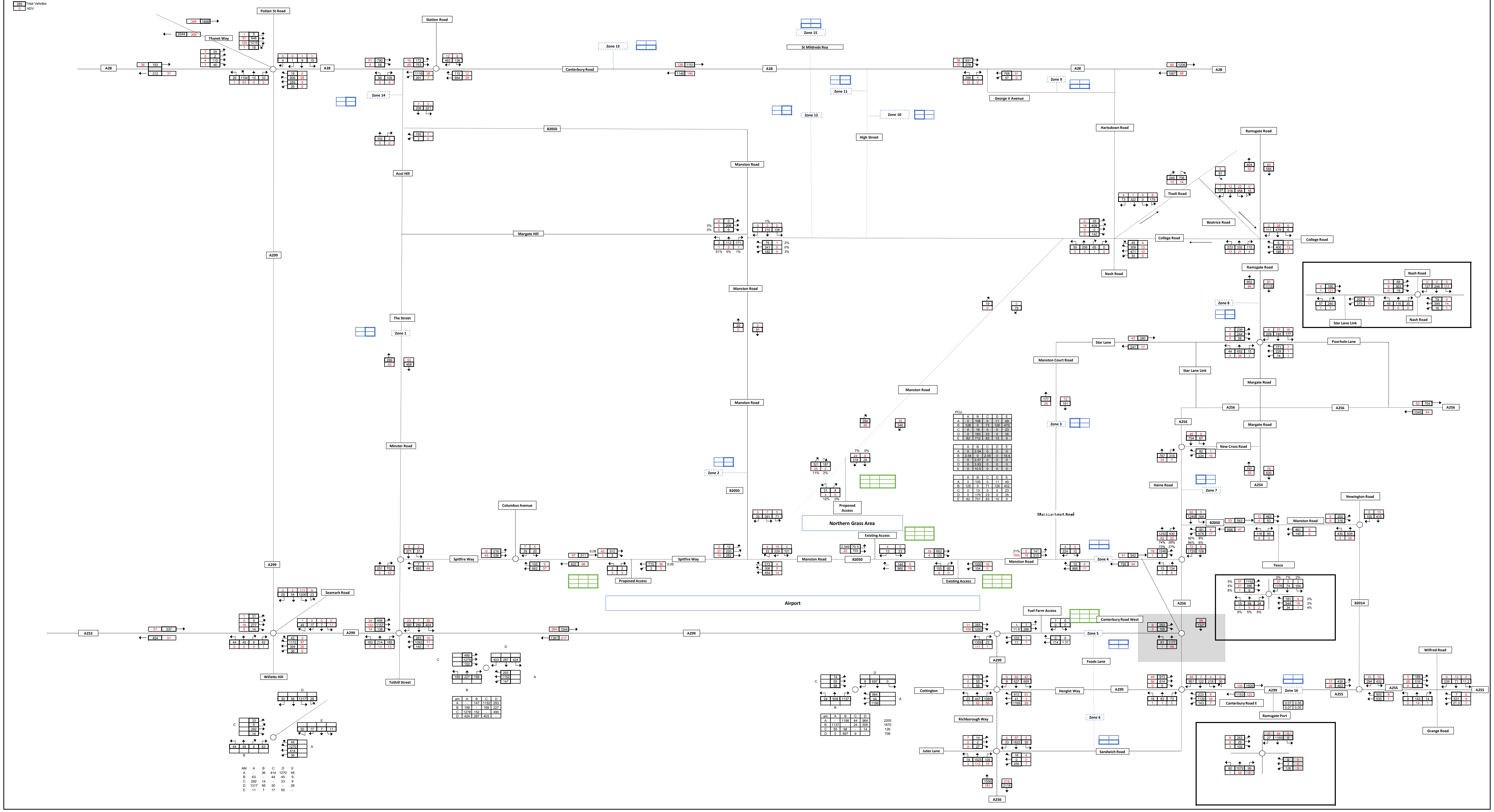
	Original traffic		Revised traffic	
	MMQ	**DoS**	**MMQ**	**DoS**
Passenger Terminal Access (1/2+1/1)	3	37.6%	1.9	22.4:22.4%
Manston Road East 5/2+5/1	8	68.2%	7.2	65.8:65.8%
Manston Road West 4/1	0	67.3%	0	72.10%

3.3.7 This indicates that junction would operate with some spare capacity in the AM and PM Peaks.

3.4 Conclusions

3.4.1 Based on the results of the junctions assessments, it is concluded that there is no material change in the modelling and results of the DCO TA as a result of the revised traffic generation set out in the Revised TA.

Appendix A
Traffic Flows


Airport
Northern Grass Area
A28
A299
A253
A256
B2050
Manston Road
Margate Hill
Canterbury Road
Ramsgate Road

Junctions 9

ARCADY 9 - Roundabout Module

For sales and distribution information, program advice and maintenance, contact TRL:
+44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk

Filename: Jct 1_R1_val_mit_opt 1_R2 - PM Peak.j9
Path: R:\Projects\38199 Manston Airport DCO EIA\4 Design\Transport\MAY 2019 - Jucntion Moddeling - URGENT\Mitigation Schemes Models to Use\Junction 1
Report generation date: 14/06/2019 10:03:21

«Mitigation - 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
	Mitigation - 2039 + Dev Traffic				
1 - Sandwich Road	1.6	0.38	0.62	C	-12 % [3 - Jutes Lane]
2 - A256 S	13.6	0.37	0.94	C	
3 - Jutes Lane	18.8	71.75	4.52	F	
4 - A256 N	5.2	0.21	0.85	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

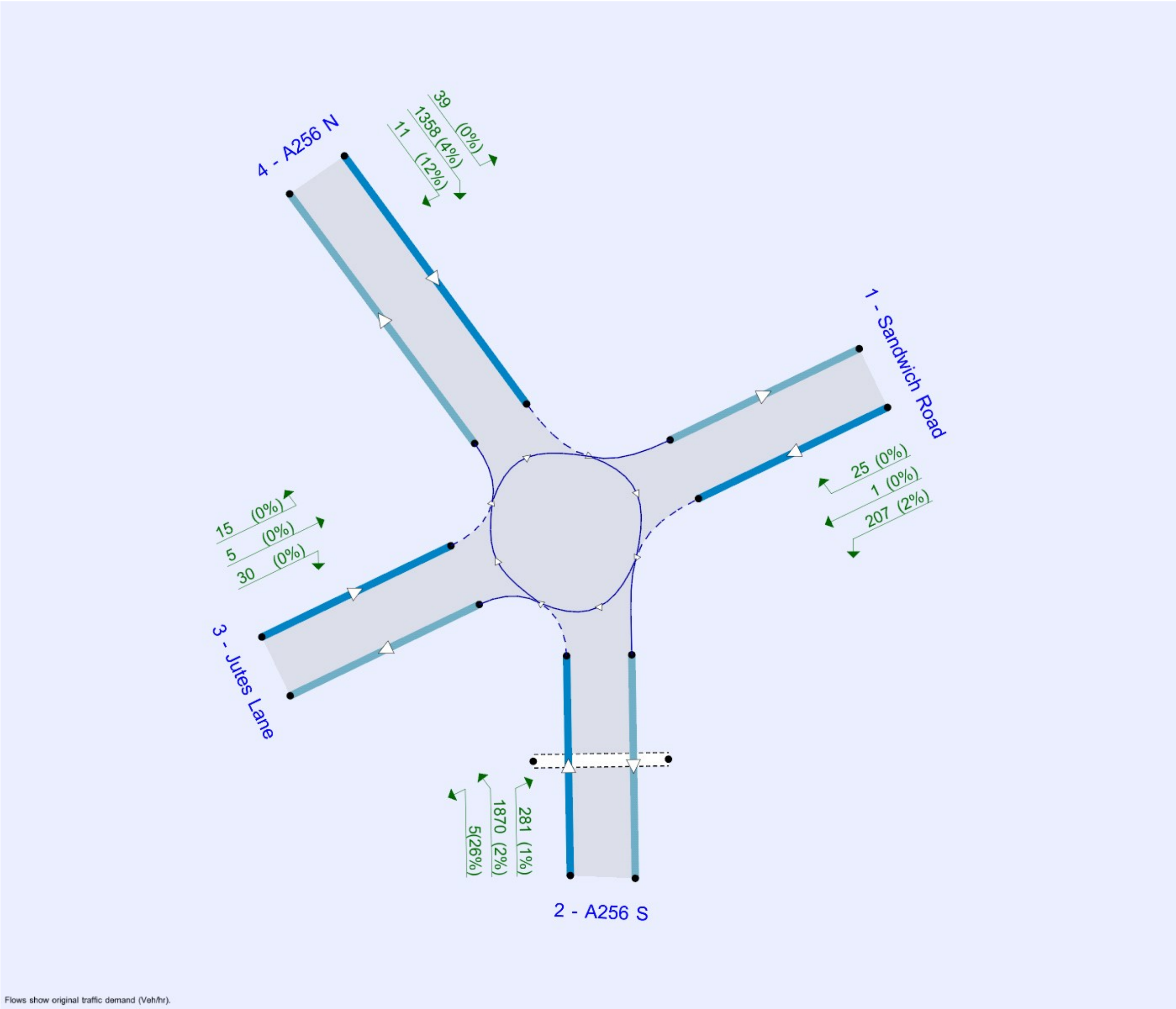
File Description

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

Appendix B
Junction Models



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

Mitigation - 2039 + Dev 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	A256/Sandwich Road	Standard Roundabout		1, 2, 3, 4	1.21	F

Junction Network Options

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

Arms

Arms

Arm	Name	Description
1	Sandwich Road	
2	A256 S	
3	Jutes Lane	
4	A256 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 - Sandwich Road	5.10	7.00	9.2	16.6	54.2	49.0	
2 - A256 S	7.28	8.04	9.4	15.0	54.2	52.0	
3 - Jutes Lane	3.56	4.50	3.9	12.3	54.2	27.5	
4 - A256 N	8.03	10.03	11.0	20.0	54.2	50.0	

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)
2 - A256 S	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 - Sandwich Road	0.576	1749
2 - A256 S	0.648	2167
3 - Jutes Lane	0.493	1212
4 - A256 N	0.738	2621

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

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
1 - Sandwich Road	Percentage	Queue validation	50.00
2 - A256 S	Percentage		120.00
4 - A256 N	Percentage		80.00

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 - Sandwich Road		ONE HOUR	✓	233	100.000
2 - A256 S		ONE HOUR	✓	2156	100.000
3 - Jutes Lane		ONE HOUR	✓	50	100.000
4 - A256 N		ONE HOUR	✓	1408	100.000

Demand overview (Pedestrians)

Arm	Profile type	Average pedestrian flow (Ped/hr)
1 - Sandwich Road		
2 - A256 S	[ONEHOUR]	60.00
3 - Jutes Lane		
4 - A256 N		

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - Sandwich Road	2 - A256 S	3 - Jutes Lane	4 - A256 N
From	1 - Sandwich Road	0	207	1	25
	2 - A256 S	281	0	5	1870
	3 - Jutes Lane	5	30	0	15
	4 - A256 N	39	1358	11	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - Sandwich Road	2 - A256 S	3 - Jutes Lane	4 - A256 N
From	1 - Sandwich Road	0	2	0	0
	2 - A256 S	1	0	26	2
	3 - Jutes Lane	0	0	0	0
	4 - A256 N	0	4	12	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 - Sandwich Road	0.62	0.38	1.6	C	214	321
2 - A256 S	0.94	0.37	13.6	C	1978	2968
3 - Jutes Lane	4.52	71.75	18.8	F	46	69
4 - A256 N	0.85	0.21	5.2	B	1292	1938

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 - Sandwich Road	175	44	1048		551	0.319	174	243	0.0	0.5	0.158	A
2 - A256 S	1623	406	28	45.17	2376	0.683	1615	1194	0.0	2.1	0.078	A
3 - Jutes Lane	38	9	1630		394	0.096	37	13	0.0	0.1	0.168	B
4 - A256 N	1060	265	237		1881	0.563	1055	1430	0.0	1.3	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 - Sandwich Road	209	52	1254		490	0.428	208	291	0.5	0.7	0.212	B
2 - A256 S	1938	485	33	53.94	2448	0.792	1932	1429	2.1	3.7	0.115	A
3 - Jutes Lane	45	11	1950		233	0.193	44	15	0.1	0.2	0.317	C
4 - A256 N	1266	316	283		1855	0.682	1262	1711	1.3	2.1	0.101	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 - Sandwich Road	257	64	1510		414	0.619	253	350	0.7	1.5	0.365	C
2 - A256 S	2374	593	40	66.06	2520	0.942	2340	1723	3.7	12.1	0.291	C
3 - Jutes Lane	55	14	2362		26	2.106	24	19	0.2	8.1	13.842	F
4 - A256 N	1550	388	322		1833	0.846	1538	2064	2.1	5.1	0.196	B

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 - Sandwich Road	257	64	1514		413	0.621	256	353	1.5	1.6	0.381	C
2 - A256 S	2374	593	41	66.06	2519	0.942	2368	1730	12.1	13.6	0.366	C
3 - Jutes Lane	55	14	2390		12	4.522	12	19	8.1	18.8	71.750	F
4 - A256 N	1550	388	317		1835	0.845	1550	2085	5.1	5.2	0.209	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 - Sandwich Road	209	52	1313		473	0.443	213	305	1.6	0.8	0.233	B
2 - A256 S	1938	485	34	53.94	2525	0.768	1979	1492	13.6	3.4	0.118	A
3 - Jutes Lane	45	11	1997		209	0.215	119	15	18.8	0.3	1.368	F
4 - A256 N	1266	316	341		1822	0.695	1277	1775	5.2	2.3	0.112	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 - Sandwich Road	175	44	1058		548	0.320	177	246	0.8	0.5	0.162	A
2 - A256 S	1623	406	28	45.17	2454	0.662	1629	1206	3.4	2.0	0.073	A
3 - Jutes Lane	38	9	1644		387	0.097	38	13	0.3	0.1	0.173	B
4 - A256 N	1060	265	239		1880	0.564	1064	1443	2.3	1.3	0.074	A

LinSig V1 style report

User and Project Details

Project:	
Title:	
Location:	
File name:	Jct 2 Signals Mit - Widen - PM.lsg3x
Author:	
Company:	
Address:	
Notes:	

Phase Input Data

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min	Cont Min
A	Traffic	1		7	7
B	Traffic	2		7	7
C	Traffic	3		7	7
D	Traffic			7	7
E	Traffic	1		7	7
F	Traffic	2		7	7
G	Traffic	3		7	7
H	Traffic			7	7

Phase Intergreens Matrix

		Starting Phase							
		A	B	C	D	E	F	G	H
Terminating Phase	A		-	-	-	5	-	-	-
	B	-		-	-	-	5	-	-
	C	-	-		-	-	-	5	-
	D	-	-	-		-	-	-	5
	E	5	-	-	-		-	-	-
	F	-	5	-	-	-		-	-
	G	-	-	5	-	-	-		-
	H	-	-	-	5	-	-	-	

Phase Delays

Stage Stream: 1

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Stage Stream: 2

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Stage Stream: 3

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Prohibited Stage Change

Stage Stream: 1

	To Stage		
From Stage		1	2
	1		5
	2	5	

Stage Stream: 2

	To Stage		
From Stage		1	2
	1		5
	2	5	

Stage Stream: 3

	To Stage		
From Stage		1	2
	1		5
	2	5	

Phases in Stage

Stream	Stage No.	Phases in Stage
1	1	A
1	2	E
2	1	B
2	2	F
3	1	C
3	2	G

LinSig V1 style report

Give-Way Lane Input Data

Junction: Unnamed Junction											
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 (Cottington Link Road)	5/1 (Ahead)	1000	0	8/2	0.33	None	-	-	-	-	-
				8/3	0.33	All					
	5/2 (Ahead)	1000	0	8/2	0.33	None					
				8/3	0.33	All					
	9/1 (Ahead)	1000	0	8/2	0.33	None					
				8/3	0.33	All					
	9/2 (Ahead)	1000	0	8/2	0.33	None					
				8/3	0.33	All					
11/2	12/2 (Ahead)	1000	0	11/3	0.33	All	-	-	-	-	-

Lane Input Data

Junction: Unnamed Junction												
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 (A299 Hengist Way N)	U		2	3	60.0	Geom	-	3.25	0.00	Y	Arm 11 Left	Inf
1/2 (A299 Hengist Way N)	U	A	2	3	60.0	Geom	-	5.00	15.00	Y	Arm 6 Ahead	16.43
1/3 (A299 Hengist Way N)	U	A	2	3	60.0	Geom	-	5.00	0.00	Y	Arm 6 Ahead	16.43
2/1 (A299 Hengist Way E)	U	B	2	3	60.0	Geom	-	5.00	0.00	Y	Arm 13 Left	40.88
2/2 (A299 Hengist Way E)	U	B	2	3	60.0	Geom	-	5.00	0.00	Y	Arm 7 Ahead	43.79
											Arm 13 Left	43.79
3/1 (A256)	U	C	2	3	6.0	Geom	-	3.25	0.00	Y	Arm 8 Ahead	Inf
3/2 (A256)	U	C	2	3	60.0	Geom	-	4.85	0.00	Y	Arm 8 Ahead	32.73
3/3 (A256)	U	C	2	3	60.0	Geom	-	4.85	0.00	Y	Arm 8 Ahead	31.17
4/1 (Cottington Link Road)	O		2	3	60.0	Geom	-	4.16	0.00	Y	Arm 5 Ahead	140.99
											Arm 9 Ahead	20.44
5/1	U	E	2	3	60.0	Geom	-	5.00	0.00	Y	Arm 11 Ahead	33.83
5/2	U	E	2	3	60.0	Geom	-	5.00	0.00	Y	Arm 6 Right	28.14
											Arm 11 Ahead	28.14
6/1	U	F	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 13 Ahead	Inf
6/2	U	F	2	3	60.0	Geom	-	5.00	0.00	Y	Arm 7 Right	25.72
											Arm 13 Ahead	39.88
7/1	U	G	2	3	60.0	Geom	-	5.00	0.00	Y	Arm 8 Right	23.96
7/2	U	G	2	3	60.0	Geom	-	5.00	0.00	Y	Arm 8 Right	19.28
8/1	U		2	3	60.0	Inf	-	-	-	-	-	-

8/2	U		2	3	60.0	Geom	-	3.25	0.00	Y	Arm 5 Right	Inf
											Arm 9 Ahead	Inf
8/3	U		2	3	60.0	Geom	-	3.25	0.00	Y	Arm 5 Right	Inf
9/1	U		2	3	60.0	Geom	-	3.25	0.00	Y		
9/2	U		2	3	60.0	Geom	-	3.25	0.00	Y		
10/1	U		2	3	60.0	Geom	-	3.25	0.00	Y		
11/1	U		2	3	60.0	Geom	-	3.25	0.00	Y	Arm 12 Ahead	Inf
11/2	O		2	3	60.0	Geom	-	3.25	0.00	Y	Arm 12 Ahead	Inf
11/3	U		2	3	60.0	Geom	-	3.25	0.00	Y	Arm 12 Ahead	Inf
12/1	U		2	3	60.0	Geom	-	3.25	0.00	Y		
12/2	U		2	3	60.0	Geom	-	3.25	0.00	Y		
13/1	U		2	3	60.0	Geom	-	3.25	0.00	Y		
13/2	U		2	3	60.0	Geom	-	3.25	0.00	Y		

Lane Saturation Flows

Scenario 1: 'PM 2039 Base + Dev Revised' (FG1: 'PM 2039 + Dev PCUs Revised', Plan 4: 'PM 2039 + Dev PCUs')

Junction: Unnamed Junction								
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 (A299 Hengist Way N)	3.25	0.00	Y	Arm 11 Left	Inf	0.0 %	1940	1940
1/2 (A299 Hengist Way N)	5.00	15.00	Y	Arm 6 Ahead	16.43	100.0 %	1361	1361
1/3 (A299 Hengist Way N)	5.00	0.00	Y	Arm 6 Ahead	16.43	100.0 %	1938	1938
2/1 (A299 Hengist Way E)	5.00	0.00	Y	Arm 13 Left	40.88	100.0 %	2040	2040
2/2 (A299 Hengist Way E)	5.00	0.00	Y	Arm 7 Ahead	43.79	87.6 %	2045	2045
				Arm 13 Left	43.79	12.4 %		
3/1 (A256)	3.25	0.00	Y	Arm 8 Ahead	Inf	100.0 %	1940	1940
3/2 (A256)	4.85	0.00	Y	Arm 8 Ahead	32.73	100.0 %	2008	2008
3/3 (A256)	4.85	0.00	Y	Arm 8 Ahead	31.17	100.0 %	2004	2004
4/1 (Cottington Link Road)	4.16	0.00	Y	Arm 5 Ahead	140.99	86.7 %	1993	1993
				Arm 9 Ahead	20.44	13.3 %		
5/1	5.00	0.00	Y	Arm 11 Ahead	33.83	100.0 %	2025	2025
5/2	5.00	0.00	Y	Arm 6 Right	28.14	3.0 %	2008	2008
				Arm 11 Ahead	28.14	97.0 %		
6/1	3.25	0.00	Y	Arm 13 Ahead	Inf	100.0 %	1940	1940
6/2	5.00	0.00	Y	Arm 7 Right	25.72	8.8 %	2035	2035
				Arm 13 Ahead	39.88	91.3 %		
7/1	5.00	0.00	Y	Arm 8 Right	23.96	100.0 %	1990	1990
7/2	5.00	0.00	Y	Arm 8 Right	19.28	100.0 %	1962	1962
8/1	Infinite Saturation Flow						Inf	Inf
8/2	3.25	0.00	Y	Arm 5 Right	Inf	37.5 %	1940	1940
				Arm 9 Ahead	Inf	62.5 %		
8/3	3.25	0.00	Y	Arm 5 Right	Inf	100.0 %	1940	1940
9/1	3.25	0.00	Y				1940	1940
9/2	3.25	0.00	Y				1940	1940
10/1	3.25	0.00	Y				1940	1940
11/1	3.25	0.00	Y	Arm 12 Ahead	Inf	0.0 %	1940	1940
11/2	3.25	0.00	Y	Arm 12 Ahead	Inf	100.0 %	1940	1940
11/3	3.25	0.00	Y	Arm 12 Ahead	Inf	100.0 %	1940	1940
12/1	3.25	0.00	Y				1940	1940
12/2	3.25	0.00	Y				1940	1940

13/1	3.25	0.00	Y				1940	1940
13/2	3.25	0.00	Y				1940	1940

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: 'PM 2039 + Dev PCUs Revised'	17:00	18:00	01:00	

Traffic Flows, Desired
FG1: 'PM 2039 + Dev PCUs Revised'
Desired Flow :

	Destination					
		A	B	C	D	Tot.
Origin	A	0	1013	72	718	1803
	B	1212	0	35	689	1936
	C	47	25	0	11	83
	D	0	435	21	0	456
	Tot.	1259	1473	128	1418	4278

Stage Timings
Scenario 1: 'PM 2039 Base + Dev Revised' (FG1: 'PM 2039 + Dev PCUs Revised', Plan 4: 'PM 2039 + Dev PCUs')

Stage Stream: 1

Stage	1	2
Duration	10	20
Change Point	37	12

Stage Stream: 2

Stage	1	2
Duration	18	12
Change Point	18	1

Stage Stream: 3

Stage	1	2
Duration	15	15
Change Point	3	23

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**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**100.5%**
Unnamed Junction	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**100.5%**
1/1	A299 Hengist Way N Left	U	N/A	N/A	-		-	-	-	0	1940	1940	0.0%
1/2	A299 Hengist Way N Ahead	U	1	N/A	A		1	10	-	228	1361	374	60.9%
1/3	A299 Hengist Way N Ahead	U	1	N/A	A		1	10	-	228	1938	533	42.8%
2/1	A299 Hengist Way E Left	U	2	N/A	B		1	18	-	901	2040	969	93.0%
2/2	A299 Hengist Way E Ahead Left	U	2	N/A	B		1	18	-	902	2045	971	92.9%
3/2+3/1	A256 Ahead	U	3	N/A	C		1	15	-	1130	2008:1940	663+663	85.2 : 85.2%
3/3	A256 Ahead	U	3	N/A	C		1	15	-	806	2004	802	100.5%
4/1	Cottington Link Road Ahead Ahead2	O	N/A	N/A	-		-	-	-	83	1993	735	11.3%
5/1	Ahead	U	1	N/A	E		1	20	-	453	2025	1063	42.6%
5/2	Right Ahead	U	1	N/A	E		1	20	-	831	2008	1054	78.4%
6/1	Ahead	U	2	N/A	F		1	12	-	241	1940	631	38.2%
6/2	Right Ahead	U	2	N/A	F		1	12	-	240	2035	661	36.3%
7/1	Right	U	3	N/A	G		1	15	-	293	1990	796	36.8%
7/2	Right	U	3	N/A	G		1	15	-	518	1962	785	66.0%
8/1	Ahead Left	U	N/A	N/A	-		-	-	-	858	Inf	Inf	0.0%
8/2	Right Ahead	U	N/A	N/A	-		-	-	-	1083	1940	1940	55.8%
8/3	Right	U	N/A	N/A	-		-	-	-	806	1940	1940	41.3%
9/1		U	N/A	N/A	-		-	-	-	735	1940	1940	37.9%
9/2		U	N/A	N/A	-		-	-	-	683	1940	1940	35.2%

10/1		U	N/A	N/A	-		-	-	-	128	1940	1940	6.6%
11/1	Ahead	U	N/A	N/A	-		-	-	-	0	1940	1940	0.0%
11/2	Ahead	O	N/A	N/A	-		-	-	-	453	1940	735	61.6%
11/3	Ahead	U	N/A	N/A	-		-	-	-	806	1940	1940	41.3%
12/1		U	N/A	N/A	-		-	-	-	0	1940	1940	0.0%
12/2		U	N/A	N/A	-		-	-	-	1259	1940	1940	64.7%
13/1		U	N/A	N/A	-		-	-	-	1142	1940	1940	58.9%
13/2		U	N/A	N/A	-		-	-	-	331	1940	1940	17.1%

LinSig V1 style report

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	**-**	**-**	**536**	**0**	**0**	**14.6**	**39.1**	**0.0**	**53.7**	**-**	**-**	**-**	**-**
Unnamed Junction	**-**	**-**	**536**	**0**	**0**	**14.6**	**39.1**	**0.0**	**53.7**	**-**	**-**	**-**	**-**
1/1	0	0	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
1/2	228	228	-	-	-	0.8	0.8	-	1.6	24.8	2.2	0.8	2.9
1/3	228	228	-	-	-	0.8	0.4	-	1.1	17.8	2.0	0.4	2.4
2/1	901	901	-	-	-	2.5	5.7	-	8.1	32.6	9.3	5.7	14.9
2/2	902	902	-	-	-	2.5	5.6	-	8.1	32.2	9.3	5.6	14.9
3/2+3/1	1130	1130	-	-	-	3.2	2.8	-	6.0	19.0	5.2	2.8	8.0
3/3	806	802	-	-	-	2.8	15.3	-	18.1	80.8	9.0	15.3	24.3
4/1	83	83	83	0	0	0.0	0.1	-	0.1	2.8	0.0	0.1	0.1
5/1	453	453	-	-	-	0.1	0.4	-	0.4	3.6	0.3	0.4	0.7
5/2	827	827	-	-	-	0.1	1.8	-	1.9	8.2	0.4	1.8	2.2
6/1	241	241	-	-	-	0.1	0.3	-	0.4	6.0	0.2	0.3	0.5
6/2	240	240	-	-	-	0.1	0.3	-	0.4	5.5	0.2	0.3	0.5
7/1	293	293	-	-	-	0.3	0.3	-	0.6	7.1	0.8	0.3	1.1
7/2	518	518	-	-	-	0.4	1.0	-	1.4	9.6	1.3	1.0	2.3
8/1	858	858	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	1083	1083	-	-	-	0.0	0.6	-	0.6	2.1	0.0	0.6	0.7
8/3	802	802	-	-	-	0.0	0.4	-	0.4	1.7	0.1	0.4	0.5
9/1	735	735	-	-	-	0.0	0.3	-	0.3	1.5	0.0	0.3	0.3
9/2	683	683	-	-	-	0.0	0.3	-	0.3	1.4	0.0	0.3	0.3
10/1	128	128	-	-	-	0.0	0.0	-	0.0	1.0	0.0	0.0	0.0
11/1	0	0	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
11/2	453	453	453	0	0	0.9	0.8	-	1.7	13.3	4.6	0.8	5.4
11/3	802	802	-	-	-	0.0	0.4	-	0.4	1.6	0.0	0.4	0.4

12/1	0	0	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
12/2	1255	1255	-	-	-	0.2	0.9	-	1.1	3.3	7.0	0.9	8.0
13/1	1142	1142	-	-	-	0.0	0.7	-	0.8	2.4	0.3	0.7	1.0
13/2	331	331	-	-	-	0.0	0.1	-	0.1	1.1	0.0	0.1	0.1

C1	Stream: 1	PRC for Signalled Lanes (%):	14.8	Total Delay for Signalled Lanes (pcuHr):	5.03	Cycle Time (s):	40
C1	Stream: 2	PRC for Signalled Lanes (%):	-3.3	Total Delay for Signalled Lanes (pcuHr):	16.99	Cycle Time (s):	40
C1	Stream: 3	PRC for Signalled Lanes (%):	-11.7	Total Delay for Signalled Lanes (pcuHr):	26.02	Cycle Time (s):	40
		PRC Over All Lanes (%):	-11.7	Total Delay Over All Lanes(pcuHr):	53.74		

LinSig V1 style report

User and Project Details

Project:	
Title:	
Location:	
File name:	Jct 4 Signals Mit_RevC - PM.lsg3x
Author:	
Company:	
Address:	
Notes:	

Phase Input Data

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min	Cont Min
A	Traffic	1		7	7
B	Traffic	2		7	7
C	Traffic	3		7	7
D	Traffic	1		7	7
E	Traffic	2		7	7
F	Traffic	3		7	7
G	Traffic	4		7	7
H	Traffic	4		7	7
I	Pedestrian	4		6	6
J	Pedestrian	4		6	6

Phase Intergreens Matrix

	Starting Phase										
Terminating Phase		A	B	C	D	E	F	G	H	I	J
	A		-	-	5	-	-	-	-	-	-
	B	-		-	-	5	-	-	-	-	-
	C	-	-		-	-	5	-	-	-	-
	D	5	-	-		-	-	-	-	-	-
	E	-	5	-	-		-	-	-	-	-
	F	-	-	5	-	-		-	-	-	-
	G	-	-	-	-	-	-		-	5	-
	H	-	-	-	-	-	-	-		-	5
	I	-	-	-	-	-	-	7	-		-
	J	-	-	-	-	-	-	-	7	-	

Phase Delays

Stage Stream: 1

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Stage Stream: 2

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Stage Stream: 3

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Stage Stream: 4

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Prohibited Stage Change

Stage Stream: 1

	To Stage		
From Stage		1	2
	1		5
	2	5	

Stage Stream: 2

	To Stage		
From Stage		1	2
	1		5
	2	5	

Stage Stream: 3

	To Stage	
From Stage	1	2
1		5
2	5	

Stage Stream: 4

	To Stage	
From Stage	1	2
1		5
2	7	

Phases in Stage

Stream	Stage No.	Phases in Stage
1	1	A
1	2	D
2	1	B
2	2	E
3	1	C
3	2	F
4	1	G H
4	2	I J

Give-Way Lane Input Data

Junction: Unnamed Junction												
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 (Tothill Street)	7/1 (Ahead)	1000	0	6/1	0.33	All	-	-	-	-	-
				6/2	0.33	To 10/2 (Ahead)					
	7/2 (Ahead)	1000	0	6/1	0.33	All					
				6/2	0.33	To 10/2 (Ahead)					
	10/1 (Left)	1000	0	6/1	0.33	All					
				6/2	0.33	To 10/2 (Ahead)					
	10/2 (Left)	1000	0	6/1	0.33	All					
				6/2	0.33	To 10/2 (Ahead)					

Lane Input Data

Junction: Unnamed Junction												
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 (B2190 N)	U	A	2	3	60.0	Geom	-	3.87	0.00	Y	Arm 5 Ahead	34.44
											Arm 12 Left	20.69
1/2 (B2190 N)	U	A	2	3	60.0	Geom	-	3.87	0.00	Y	Arm 5 Ahead	34.44
2/1 (Hengist Way E)	U	B	2	3	60.0	Geom	-	4.37	0.00	Y	Arm 6 Ahead	146.76
											Arm 9 Left	95.29
2/2 (Hengist Way E)	U	B	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 6 Ahead	Inf
3/1 (Tothill Street)	O		2	3	60.0	Geom	-	5.00	0.00	Y	Arm 7 Ahead	163.43
											Arm 10 Left	31.89
4/1 (A299 W)	U	C	2	3	60.0	Geom	-	3.70	0.00	Y	Arm 8 Ahead	Inf
											Arm 11 Left	37.70
4/2 (A299 W)	U	C	2	3	60.0	Geom	-	3.70	0.00	Y	Arm 8 Ahead	55.74
5/1	U	E	2	3	60.0	Geom	-	4.95	0.00	Y	Arm 6 Right	Inf
											Arm 9 Ahead	Inf
5/2	U	E	2	3	60.0	Geom	-	4.95	0.00	Y	Arm 6 Right	Inf
6/1	U		2	3	60.0	Geom	-	3.25	0.00	Y	Arm 10 Ahead	Inf
6/2	U		2	3	60.0	Geom	-	3.25	0.00	Y	Arm 7 Right	Inf
											Arm 10 Ahead	Inf
7/1	U	F	2	3	60.0	Geom	-	5.00	0.00	Y	Arm 11 Ahead	Inf
7/2	U	F	2	3	60.0	Geom	-	5.00	0.00	Y	Arm 8 Right	Inf
											Arm 11 Ahead	Inf
8/1	U	D	2	3	60.0	Geom	-	5.00	0.00	Y	Arm 12 Ahead	Inf
8/2	U	D	2	3	60.0	Geom	-	5.00	0.00	Y	Arm 5 Right	Inf

											Arm 12 Ahead	Inf
9/1	U		2	3	60.0	Geom	-	3.25	0.00	Y		
10/1	U	H	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 14 Ahead	Inf
10/2	U	H	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 14 Ahead	Inf
11/1	U		2	3	60.0	Geom	-	3.25	0.00	Y		
11/2	U		2	3	60.0	Geom	-	3.25	0.00	Y		
12/1	U		2	3	60.0	Geom	-	3.25	0.00	Y		
12/2	U		2	3	60.0	Geom	-	3.25	0.00	Y		
13/1	U	G	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 4 Ahead	Inf
13/2	U	G	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 4 Ahead	Inf
14/1	U		2	3	60.0	Inf	-	-	-	-	-	-
14/2	U		2	3	60.0	Inf	-	-	-	-	-	-

Lane Saturation Flows

Scenario 1: 'PM 2039 + Dev Revised' (FG1: 'PM 2039 + Dev PCUs Revised', Plan 2: 'PM')

Junction: Unnamed Junction								
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 (B2190 N)	3.87	0.00	Y	Arm 5 Ahead	34.44	48.5 %	1891	1891
				Arm 12 Left	20.69	51.5 %		
1/2 (B2190 N)	3.87	0.00	Y	Arm 5 Ahead	34.44	100.0 %	1918	1918
2/1 (Hengist Way E)	4.37	0.00	Y	Arm 6 Ahead	146.76	72.9 %	2028	2028
				Arm 9 Left	95.29	27.1 %		
2/2 (Hengist Way E)	3.25	0.00	Y	Arm 6 Ahead	Inf	100.0 %	1940	1940
3/1 (Tothill Street)	5.00	0.00	Y	Arm 7 Ahead	163.43	69.9 %	2072	2072
				Arm 10 Left	31.89	30.1 %		
4/1 (A299 W)	3.70	0.00	Y	Arm 8 Ahead	Inf	60.9 %	1955	1955
				Arm 11 Left	37.70	39.1 %		
4/2 (A299 W)	3.70	0.00	Y	Arm 8 Ahead	55.74	100.0 %	1933	1933
5/1	4.95	0.00	Y	Arm 6 Right	Inf	0.0 %	2110	2110
				Arm 9 Ahead	Inf	100.0 %		
5/2	4.95	0.00	Y	Arm 6 Right	Inf	100.0 %	2110	2110
6/1	3.25	0.00	Y	Arm 10 Ahead	Inf	100.0 %	1940	1940
6/2	3.25	0.00	Y	Arm 7 Right	Inf	22.7 %	1940	1940
				Arm 10 Ahead	Inf	77.3 %		
7/1	5.00	0.00	Y	Arm 11 Ahead	Inf	100.0 %	2115	2115
7/2	5.00	0.00	Y	Arm 8 Right	Inf	42.0 %	2115	2115
				Arm 11 Ahead	Inf	58.0 %		
8/1	5.00	0.00	Y	Arm 12 Ahead	Inf	100.0 %	2115	2115
8/2	5.00	0.00	Y	Arm 5 Right	Inf	17.5 %	2115	2115
				Arm 12 Ahead	Inf	82.5 %		
9/1	3.25	0.00	Y				1940	1940
10/1	3.25	0.00	Y	Arm 14 Ahead	Inf	100.0 %	1940	1940
10/2	3.25	0.00	Y	Arm 14 Ahead	Inf	100.0 %	1940	1940
11/1	3.25	0.00	Y				1940	1940
11/2	3.25	0.00	Y				1940	1940
12/1	3.25	0.00	Y				1940	1940
12/2	3.25	0.00	Y				1940	1940
13/1	3.25	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1940	1940
13/2	3.25	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1940	1940
14/1	Infinite Saturation Flow						Inf	Inf

14/2	Infinite Saturation Flow	Inf	Inf

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: 'PM 2039 + Dev PCUs Revised'	17:00	18:00	01:00	

Traffic Flows, Desired

FG1: 'PM 2039 + Dev PCUs Revised'

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	189	929	278	1396
	B	179	0	170	215	564
	C	1397	188	0	385	1970
	D	315	297	526	0	1138
	Tot.	1891	674	1625	878	5068

Stage Timings

Scenario 1: 'PM 2039 + Dev Revised' (FG1: 'PM 2039 + Dev PCUs Revised', Plan 2: 'PM')

Stage Stream: 1

Stage	1	2
Duration	11	19
Change Point	7	23

Stage Stream: 2

Stage	1	2
Duration	13	17
Change Point	28	6

Stage Stream: 3

Stage	1	2
Duration	22	8
Change Point	27	14

Stage Stream: 4

Stage	1	2
Duration	22	6
Change Point	21	10

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**	-	-		-	-	-	-	-	-	**107.9%**
Unnamed Junction	-	-	**N/A**	-	-		-	-	-	-	-	-	**107.9%**
1/1	B2190 N Ahead Left	U	1	N/A	A		1	11	-	612	1891	567	107.9%
1/2	B2190 N Ahead	U	1	N/A	A		1	11	-	526	1918	575	91.4%
2/1	Hengist Way E Ahead Left	U	2	N/A	B		1	13	-	698	2028	710	98.3%
2/2	Hengist Way E Ahead	U	2	N/A	B		1	13	-	698	1940	679	102.8%
3/1	Tothill Street Ahead Left	O	N/A	N/A	-		-	-	-	564	2072	523	107.8%
4/1	A299 W Ahead Left	U	3	N/A	C		1	22	-	985	1955	1124	87.6%
4/2	A299 W Ahead	U	3	N/A	C		1	22	-	985	1933	1111	88.6%
5/1	Right Ahead	U	2	N/A	E		1	17	-	485	2110	950	48.7%
5/2	Right	U	2	N/A	E		1	17	-	526	2110	950	55.4%
6/1	Ahead	U	N/A	N/A	-		-	-	-	509	1940	1940	26.2%
6/2	Right Ahead	U	N/A	N/A	-		-	-	-	1224	1940	1940	62.1%
7/1	Ahead	U	3	N/A	F		1	8	-	246	2115	476	49.3%
7/2	Right Ahead	U	3	N/A	F		1	8	-	426	2115	476	84.4%
8/1	Ahead	U	1	N/A	D		1	19	-	690	2115	1058	64.6%
8/2	Right Ahead	U	1	N/A	D		1	19	-	1074	2115	1058	101.0%
9/1		U	N/A	N/A	-		-	-	-	674	1940	1940	33.6%
10/1	Ahead	U	4	N/A	H		1	22	-	594	1940	1115	52.7%
10/2	Ahead	U	4	N/A	H		1	22	-	1031	1940	1115	90.9%
11/1		U	N/A	N/A	-		-	-	-	439	1940	1940	22.0%
11/2		U	N/A	N/A	-		-	-	-	439	1940	1940	22.0%

12/1		U	N/A	N/A	-		-	-	-	848	1940	1940	42.8%
12/2		U	N/A	N/A	-		-	-	-	1043	1940	1940	52.4%
13/1	Ahead	U	4	N/A	G		1	22	-	985	1940	1115	88.3%
13/2	Ahead	U	4	N/A	G		1	22	-	985	1940	1115	88.3%
14/1		U	N/A	N/A	-		-	-	-	594	Inf	Inf	0.0%
14/2		U	N/A	N/A	-		-	-	-	1031	Inf	Inf	0.0%
Ped Link: P1	Unnamed Ped Link	-	4	-	I		1	6	-	0	-	0	0.0%
Ped Link: P2	Unnamed Ped Link	-	4	-	J		1	6	-	0	-	0	0.0%

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	**-**	**-**	**523**	**0**	**0**	**27.3**	**133.4**	**0.0**	**160.7**	**-**	**-**	**-**	**-**
Unnamed Junction	**-**	**-**	**523**	**0**	**0**	**27.3**	**133.4**	**0.0**	**160.7**	**-**	**-**	**-**	**-**
1/1	612	567	-	-	-	3.1	27.8	-	31.0	182.2	7.3	27.8	35.1
1/2	526	526	-	-	-	2.0	4.5	-	6.5	44.3	5.6	4.5	10.1
2/1	698	698	-	-	-	2.5	10.6	-	13.1	67.5	7.6	10.6	18.1
2/2	698	679	-	-	-	2.9	18.8	-	21.7	112.0	8.0	18.8	26.8
3/1	564	523	523	0	0	1.6	25.8	-	27.4	175.1	18.5	25.8	44.3
4/1	985	985	-	-	-	0.2	3.4	-	3.5	12.9	0.6	3.4	4.0
4/2	985	985	-	-	-	0.2	3.7	-	3.8	14.0	3.8	3.7	7.4
5/1	463	463	-	-	-	0.6	0.5	-	1.1	8.5	2.2	0.5	2.7
5/2	526	526	-	-	-	0.1	0.6	-	0.8	5.2	0.3	0.6	0.9
6/1	509	509	-	-	-	0.0	0.2	-	0.2	1.3	0.0	0.2	0.2
6/2	1205	1205	-	-	-	0.0	0.8	-	0.8	2.4	0.0	0.8	0.8
7/1	235	235	-	-	-	0.7	0.5	-	1.2	18.9	2.4	0.5	2.8
7/2	402	402	-	-	-	1.5	2.5	-	4.0	36.1	4.2	2.5	6.7
8/1	684	684	-	-	-	1.6	0.9	-	2.5	13.3	4.3	0.9	5.2
8/2	1068	1058	-	-	-	3.2	19.1	-	22.3	75.1	10.9	19.1	30.0
9/1	652	652	-	-	-	0.0	0.3	-	0.3	1.4	0.0	0.3	0.3
10/1	588	588	-	-	-	1.2	0.6	-	1.7	10.5	3.2	0.6	3.7
10/2	1013	1013	-	-	-	1.8	4.6	-	6.4	22.6	9.4	4.6	13.9
11/1	428	428	-	-	-	0.0	0.1	-	0.1	1.2	0.0	0.1	0.1
11/2	427	427	-	-	-	0.0	0.1	-	0.1	1.2	0.0	0.1	0.1
12/1	830	830	-	-	-	0.0	0.4	-	0.4	1.6	1.7	0.4	2.1
12/2	1016	1016	-	-	-	0.0	0.5	-	0.5	1.9	0.0	0.5	0.5
13/1	985	985	-	-	-	2.0	3.6	-	5.6	20.4	9.3	3.6	12.9

13/2	985	985	-	-	-	2.0	3.6	-	5.6	20.4	9.3	3.6	12.9
14/1	588	588	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
14/2	1013	1013	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-

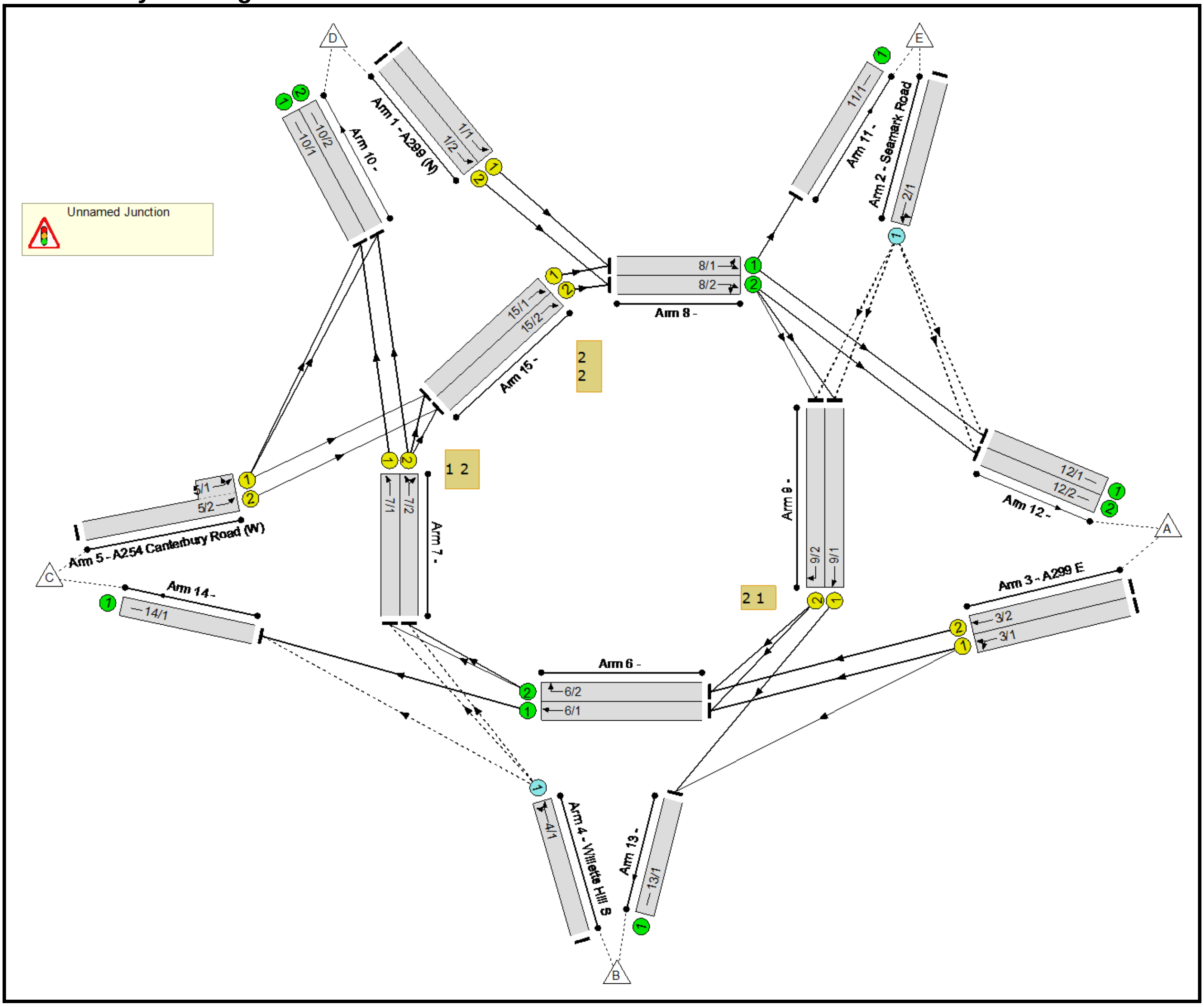
C1	Stream: 1	PRC for Signalled Lanes (%):	-19.9	Total Delay for Signalled Lanes (pcuHr):	62.26	Cycle Time (s):	40
C1	Stream: 2	PRC for Signalled Lanes (%):	-14.2	Total Delay for Signalled Lanes (pcuHr):	36.66	Cycle Time (s):	40
C1	Stream: 3	PRC for Signalled Lanes (%):	1.6	Total Delay for Signalled Lanes (pcuHr):	12.63	Cycle Time (s):	40
C1	Stream: 4	PRC for Signalled Lanes (%):	-0.9	Total Delay for Signalled Lanes (pcuHr):	19.27	Cycle Time (s):	40
		PRC Over All Lanes (%):	-19.9	Total Delay Over All Lanes(pcuHr):	160.69		

Full Input Data And Results

User and Project Details

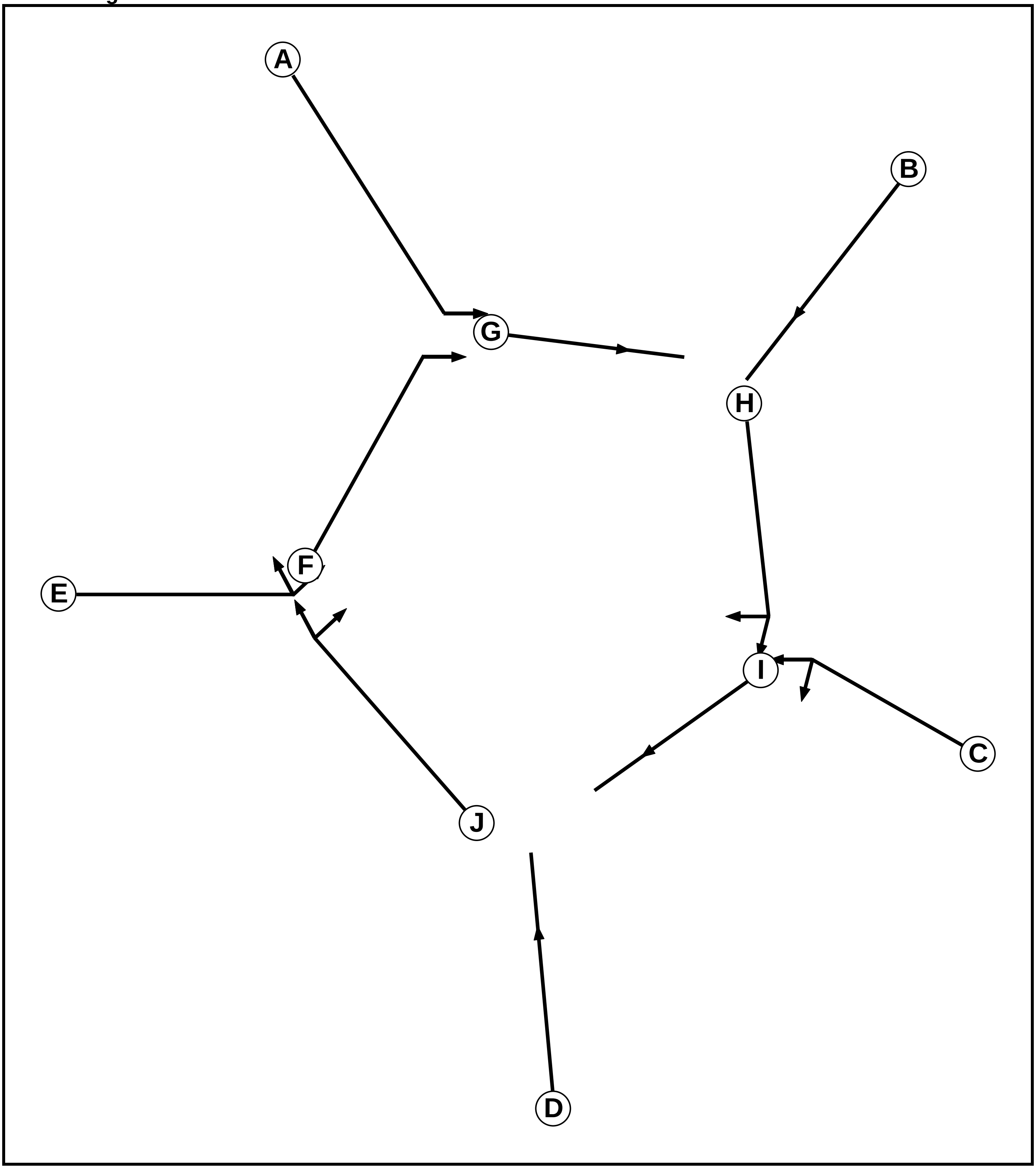
Project:	
Title:	
Location:	
File name:	Jct 6 Signals Mit RevA - PM.lsg3x
Author:	
Company:	
Address:	
Notes:	

Network Layout Diagram



Full Input Data And Results

Phase Diagram



Full Input Data And Results

Phase Input Data

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min	Cont Min
A	Traffic	1		7	7
B	Traffic			7	7
C	Traffic	2		7	7
D	Traffic			7	7
E	Traffic	3		7	7
F	Traffic	1		7	7
G	Traffic			7	7
H	Traffic	2		7	7
I	Traffic			7	7
J	Traffic	3		7	7

Phase Intergreens Matrix

	Starting Phase										
		A	B	C	D	E	F	G	H	I	J
Terminating Phase	A		5	-	5	-	5	5	-	5	-
	B	5		5	5	5	5	5	5	5	5
	C	-	5		5	-	-	5	5	5	-
	D	5	5	5		5	5	5	5	5	5
	E	-	5	-	5		-	5	-	5	5
	F	5	5	-	5	-		5	-	5	-
	G	5	5	5	5	5	5		5	5	5
	H	-	5	5	5	-	-	5		5	-
	I	5	5	5	5	5	5	5	5		5
	J	-	5	-	5	5	-	5	-	5	

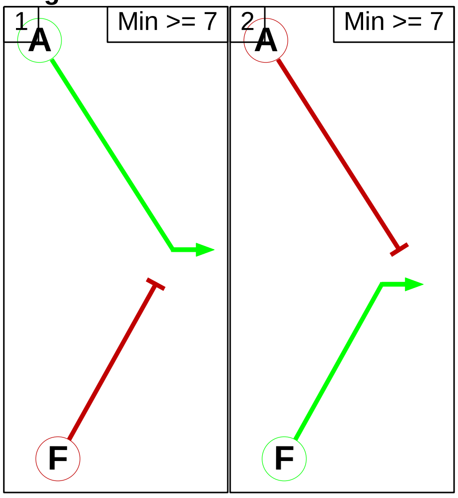
Phases in Stage

Stream	Stage No.	Phases in Stage
1	1	A
1	2	F
2	1	C
2	2	H
3	1	E
3	2	J

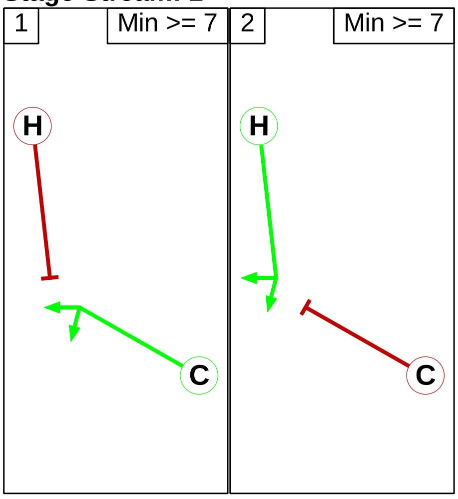
Full Input Data And Results

Stage Diagram

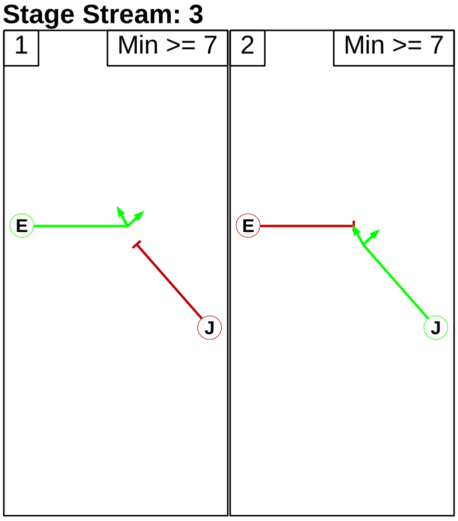
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Phase Delays

Stage Stream: 1

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Stage Stream: 2

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Stage Stream: 3

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Prohibited Stage Change

Stage Stream: 1

	To Stage		
From Stage		1	2
	1		5
	2	5	

Stage Stream: 2

	To Stage		
From Stage		1	2
	1		5
	2	5	

Stage Stream: 3

	To Stage		
From Stage		1	2
	1		5
	2	5	

Full Input Data And Results

Give-Way Lane Input Data

Junction: Unnamed Junction											
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)**
2/1 (Seamark Road)	9/1 (Ahead)	1000	0	8/1	0.33	All	-	-	-	-	-
				8/2	0.33	All					
	9/2 (Ahead)	1000	0	8/1	0.33	All					
				8/2	0.33	All					
	12/1 (Left)	1000	0	8/1	0.33	All					
				8/2	0.33	All					
	12/2 (Left)	1000	0	8/1	0.33	All					
				8/2	0.33	All					
4/1 (Willetts Hill S)	7/1 (Ahead)	1000	0	6/1	0.33	All	-	-	-	-	-
				6/2	0.33	All					
	7/2 (Ahead)	1000	0	6/1	0.33	All					
				6/2	0.33	All					
	14/1 (Left)	1000	0	6/1	0.33	All					
				6/2	0.33	All					

Full Input Data And Results

Lane Input Data

Junction: Unnamed Junction												
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 (A299 (N))	U	A	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 8 Left	Inf
1/2 (A299 (N))	U	A	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 8 Left	Inf
2/1 (Seamark Road)	O		2	3	60.0	Geom	-	5.00	0.00	Y	Arm 9 Ahead	182.87
											Arm 12 Left	41.14
3/1 (A299 E)	U	C	2	3	60.0	Geom	-	3.70	0.00	Y	Arm 6 Ahead	81.41
											Arm 13 Left	49.73
3/2 (A299 E)	U	C	2	3	60.0	Geom	-	3.70	0.00	Y	Arm 6 Ahead	81.41
4/1 (Willetts Hill S)	O		2	3	60.0	Geom	-	5.00	0.00	Y	Arm 7 Ahead	132.96
											Arm 14 Left	97.37
5/1 (A254 Canterbury Road (W))	U	E	2	3	3.0	Geom	-	4.17	0.00	Y	Arm 10 Left	Inf
											Arm 15 Ahead	Inf
5/2 (A254 Canterbury Road (W))	U	E	2	3	60.0	Geom	-	4.17	0.00	Y	Arm 15 Ahead	27.85
6/1	U		2	3	60.0	Geom	-	4.62	0.00	Y	Arm 14 Ahead	Inf
6/2	U		2	3	60.0	Geom	-	4.62	0.00	Y	Arm 7 Right	Inf
7/1	U	J	2	3	60.0	Geom	-	4.60	0.00	Y	Arm 10 Ahead	52.76
7/2	U	J	2	3	60.0	Geom	-	4.60	0.00	Y	Arm 10 Ahead	34.86
											Arm 15 Right	34.86
8/1	U		2	3	60.0	Geom	-	3.25	0.00	Y	Arm 11 Left	Inf
											Arm 12 Ahead	Inf
8/2	U		2	3	60.0	Geom	-	3.25	0.00	Y	Arm 9 Right	Inf
											Arm 12 Ahead	Inf
9/1	U	H	2	3	60.0	Geom	-	4.63	0.00	Y	Arm 13 Ahead	51.85
9/2	U	H	2	3	60.0	Geom	-	4.63	0.00	Y	Arm 6 Right	36.32

10/1	U		2	3	60.0	Geom	-	3.25	0.00	Y		
10/2	U		2	3	60.0	Geom	-	3.25	0.00	Y		
11/1	U		2	3	60.0	Geom	-	3.25	0.00	Y		
12/1	U		2	3	60.0	Geom	-	3.25	0.00	Y		
12/2	U		2	3	60.0	Geom	-	3.25	0.00	Y		
13/1	U		2	3	60.0	Geom	-	3.25	0.00	Y		
14/1	U		2	3	60.0	Geom	-	3.25	0.00	Y		
15/1	U	F	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 8 Ahead	Inf
15/2	U	F	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 8 Ahead	Inf

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: 'AM 2039 + Dev (Link + Sigs) PCUs'	08:00	09:00	01:00	
2: 'PM 2039 + Dev (Link + Sigs) PCUs'	17:00	18:00	01:00	

Scenario 1: 'PM 2039 + Dev (Link + Sigs)' (FG2: 'PM 2039 + Dev (Link + Sigs) PCUs', Plan 2: 'PM')

Traffic Flows, Desired

Desired Flow :

		Destination					
Origin		A	B	C	D	E	Tot.
	A	0	87	289	1038	27	1441
	B	48	0	8	19	1	76
	C	531	15	0	25	8	579
	D	1203	23	12	0	1	1239
	E	19	6	2	1	0	28
	Tot.	1801	131	311	1083	37	3363

Traffic Lane Flows

Lane	Scenario 1: PM 2039 + Dev (Link + Sigs)
Junction: Unnamed Junction	
1/1	619
1/2	620
2/1	28
3/1	376
3/2	1065
4/1	76
5/1 (short)	290
5/2 (with short)	579(In) 289(Out)
6/1	303
6/2	1066
7/1	530
7/2	604
8/1	936
8/2	933
9/1	44
9/2	15
10/1	542
10/2	541
11/1	37
12/1	908
12/2	893
13/1	131
14/1	311
15/1	317
15/2	313

Lane Saturation Flows

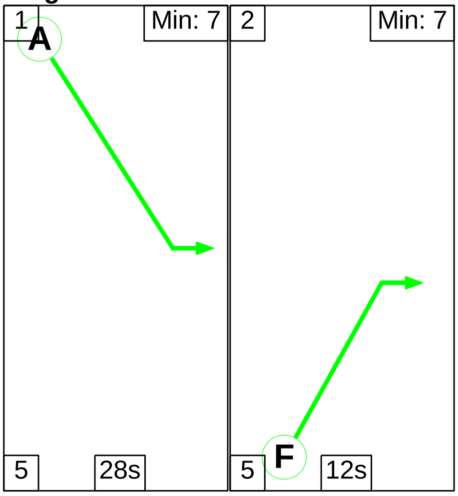
Junction: Unnamed Junction								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (A299 (N))	3.25	0.00	Y	Arm 8 Left	Inf	100.0 %	1940	1940
1/2 (A299 (N))	3.25	0.00	Y	Arm 8 Left	Inf	100.0 %	1940	1940
2/1 (Seamark Road)	5.00	0.00	Y	Arm 9 Ahead	182.87	32.1 %	2059	2059
				Arm 12 Left	41.14	67.9 %		
3/1 (A299 E)	3.70	0.00	Y	Arm 6 Ahead	81.41	76.9 %	1944	1944
				Arm 13 Left	49.73	23.1 %		
3/2 (A299 E)	3.70	0.00	Y	Arm 6 Ahead	81.41	100.0 %	1949	1949
4/1 (Willetts Hill S)	5.00	0.00	Y	Arm 7 Ahead	132.96	89.5 %	2091	2091
				Arm 14 Left	97.37	10.5 %		
5/1 (A254 Canterbury Road (W))	4.17	0.00	Y	Arm 10 Left	Inf	8.6 %	2032	2032
				Arm 15 Ahead	Inf	91.4 %		
5/2 (A254 Canterbury Road (W))	4.17	0.00	Y	Arm 15 Ahead	27.85	100.0 %	1928	1928
6/1	4.62	0.00	Y	Arm 14 Ahead	Inf	100.0 %	2077	2077
6/2	4.62	0.00	Y	Arm 7 Right	Inf	100.0 %	2077	2077
7/1	4.60	0.00	Y	Arm 10 Ahead	52.76	100.0 %	2018	2018
7/2	4.60	0.00	Y	Arm 10 Ahead	34.86	87.4 %	1989	1989
				Arm 15 Right	34.86	12.6 %		
8/1	3.25	0.00	Y	Arm 11 Left	Inf	4.0 %	1940	1940
				Arm 12 Ahead	Inf	96.0 %		
8/2	3.25	0.00	Y	Arm 9 Right	Inf	5.4 %	1940	1940
				Arm 12 Ahead	Inf	94.6 %		
9/1	4.63	0.00	Y	Arm 13 Ahead	51.85	100.0 %	2020	2020
9/2	4.63	0.00	Y	Arm 6 Right	36.32	100.0 %	1996	1996
10/1	3.25	0.00	Y				1940	1940
10/2	3.25	0.00	Y				1940	1940
11/1	3.25	0.00	Y				1940	1940
12/1	3.25	0.00	Y				1940	1940
12/2	3.25	0.00	Y				1940	1940
13/1	3.25	0.00	Y				1940	1940
14/1	3.25	0.00	Y				1940	1940
15/1	3.25	0.00	Y	Arm 8 Ahead	Inf	100.0 %	1940	1940
15/2	3.25	0.00	Y	Arm 8 Ahead	Inf	100.0 %	1940	1940

Full Input Data And Results

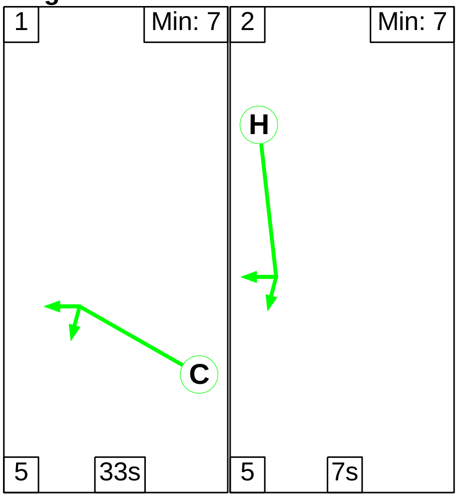
Scenario 1: 'PM 2039 + Dev (Link + Sigs)' (FG2: 'PM 2039 + Dev (Link + Sigs) PCUs', Plan 2: 'PM')

Stage Sequence Diagram

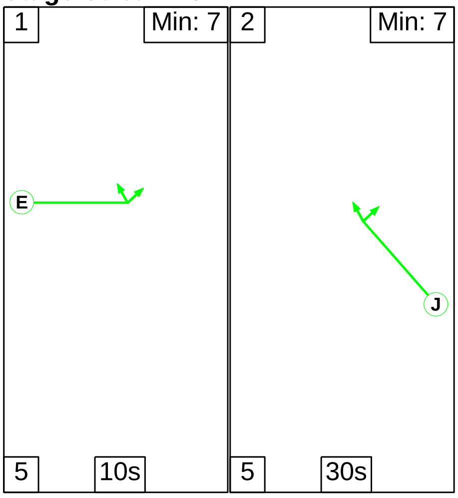
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	28	12
Change Point	44	27

Full Input Data And Results

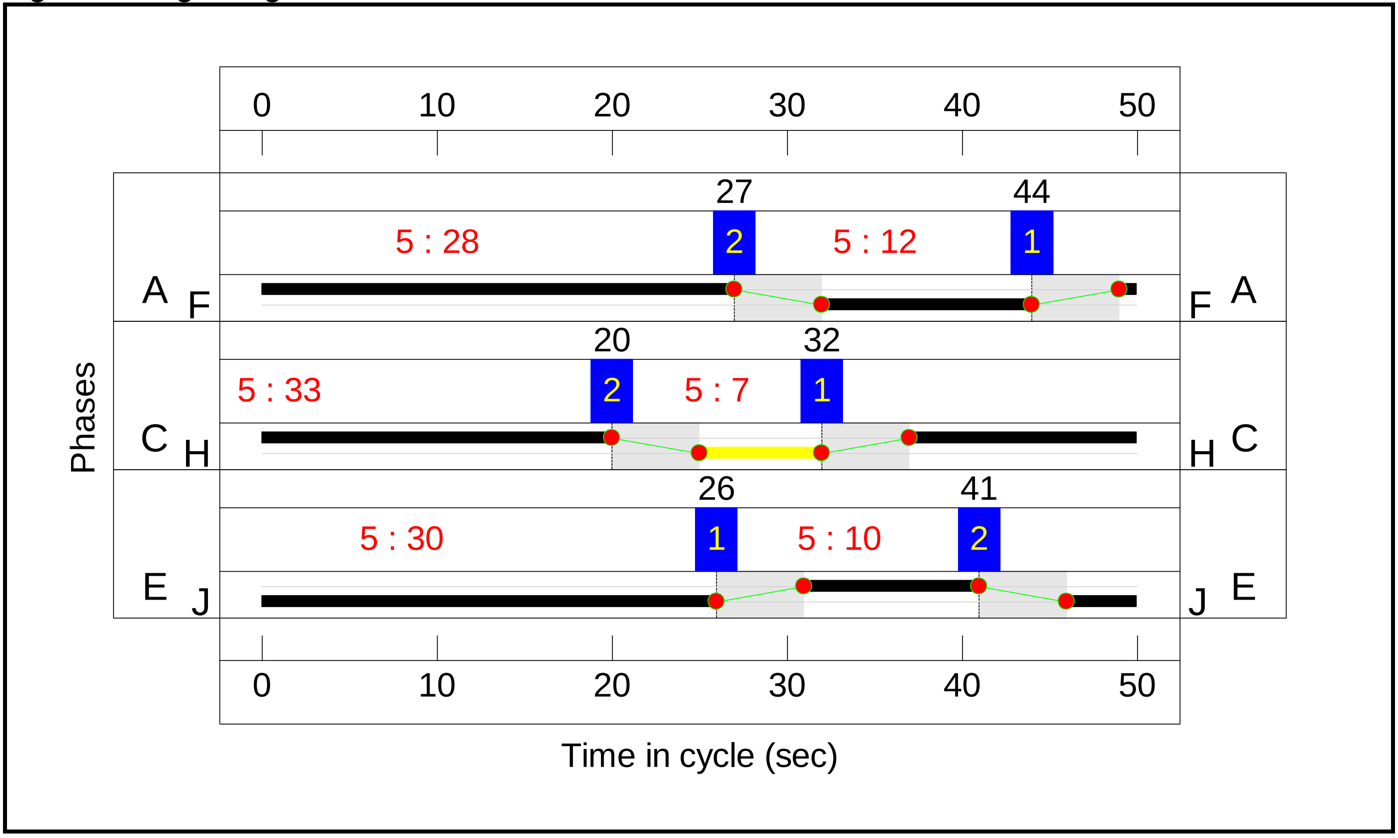
Stage Stream: 2

Stage	1	2
Duration	33	7
Change Point	32	20

Stage Stream: 3

Stage	1	2
Duration	10	30
Change Point	26	41

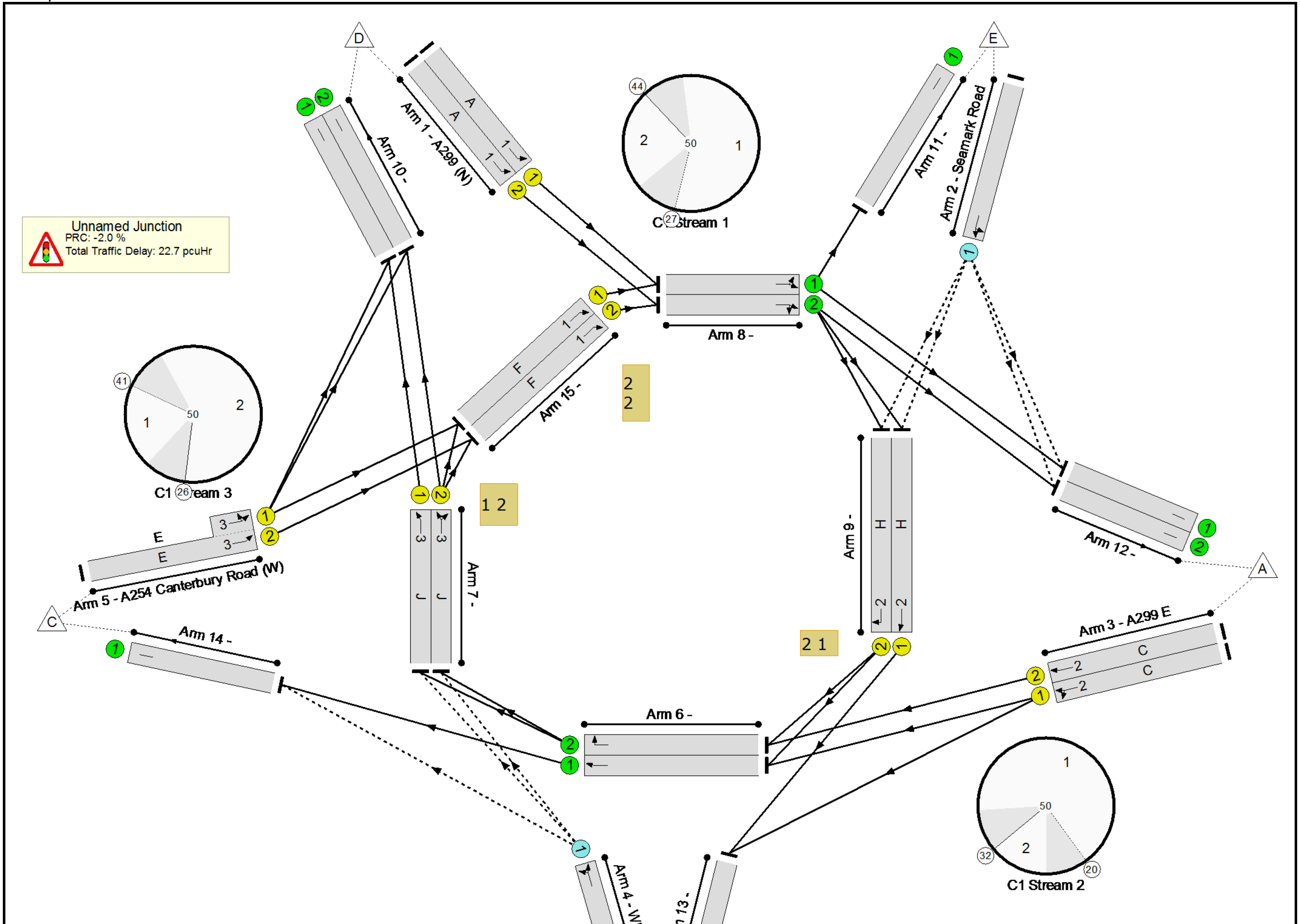
Signal Timings Diagram



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	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**91.8%**
Unnamed Junction	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**91.8%**
1/1	A299 (N) Left	U	1	N/A	A		1	28	-	619	1940	1125	55.0%
1/2	A299 (N) Left	U	1	N/A	A		1	28	-	620	1940	1125	55.1%
2/1	Seamark Road Ahead Left	O	N/A	N/A	-		-	-	-	28	2059	416	6.7%
3/1	A299 E Ahead Left	U	2	N/A	C		1	33	-	376	1944	1322	28.4%
3/2	A299 E Ahead	U	2	N/A	C		1	33	-	1065	1949	1325	80.4%
4/1	Willetts Hill S Ahead Left	O	N/A	N/A	-		-	-	-	76	2091	548	13.9%
5/2+5/1	A254 Canterbury Road (W) Left Ahead	U	3	N/A	E		1	10	-	579	1928:2032	315+316	91.8 : 91.8%
6/1	Ahead	U	N/A	N/A	-		-	-	-	303	2077	2077	14.6%
6/2	Right	U	N/A	N/A	-		-	-	-	1066	2077	2077	51.3%
7/1	Ahead	U	3	N/A	J		1	30	-	530	2018	1251	42.4%
7/2	Ahead Right	U	3	N/A	J		1	30	-	604	1989	1233	49.0%
8/1	Left Ahead	U	N/A	N/A	-		-	-	-	936	1940	1940	48.2%
8/2	Right Ahead	U	N/A	N/A	-		-	-	-	933	1940	1940	48.1%
9/1	Ahead	U	2	N/A	H		1	7	-	44	2020	323	13.6%
9/2	Right	U	2	N/A	H		1	7	-	15	1996	319	4.7%
10/1		U	N/A	N/A	-		-	-	-	542	1940	1940	27.9%
10/2		U	N/A	N/A	-		-	-	-	541	1940	1940	27.9%
11/1		U	N/A	N/A	-		-	-	-	37	1940	1940	1.9%
12/1		U	N/A	N/A	-		-	-	-	908	1940	1940	46.8%
12/2		U	N/A	N/A	-		-	-	-	893	1940	1940	46.0%
13/1		U	N/A	N/A	-		-	-	-	131	1940	1940	6.8%

Full Input Data And Results

14/1		U	N/A	N/A	-		-	-	-	311	1940	1940	16.0%
15/1	Ahead	U	1	N/A	F		1	12	-	317	1940	504	62.8%
15/2	Ahead	U	1	N/A	F		1	12	-	313	1940	504	62.1%

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	**-**	**-**	**104**	**0**	**0**	**8.9**	**13.8**	**0.0**	**22.7**	**-**	**-**	**-**	**-**
Unnamed Junction	**-**	**-**	**104**	**0**	**0**	**8.9**	**13.8**	**0.0**	**22.7**	**-**	**-**	**-**	**-**
1/1	619	619	-	-	-	1.1	0.6	-	1.7	10.0	5.2	0.6	5.8
1/2	620	620	-	-	-	1.1	0.6	-	1.7	10.0	5.2	0.6	5.8
2/1	28	28	28	0	0	0.0	0.0	-	0.0	5.5	0.1	0.0	0.1
3/1	376	376	-	-	-	0.3	0.2	-	0.5	5.1	2.0	0.2	2.2
3/2	1065	1065	-	-	-	1.7	2.0	-	3.7	12.5	10.4	2.0	12.4
4/1	76	76	76	0	0	0.0	0.1	-	0.1	3.8	0.0	0.1	0.1
5/2+5/1	579	579	-	-	-	2.9	4.7	-	7.6	47.5	4.7	4.7	9.4
6/1	303	303	-	-	-	0.0	0.1	-	0.1	1.0	0.0	0.1	0.1
6/2	1066	1066	-	-	-	0.0	0.5	-	0.5	1.8	0.0	0.5	0.5
7/1	530	530	-	-	-	0.2	0.4	-	0.6	4.2	0.9	0.4	1.3
7/2	604	604	-	-	-	0.3	0.5	-	0.8	4.8	1.4	0.5	1.9
8/1	936	936	-	-	-	0.0	0.5	-	0.5	1.8	0.0	0.5	0.5
8/2	933	933	-	-	-	0.0	0.5	-	0.5	1.8	0.0	0.5	0.5
9/1	44	44	-	-	-	0.2	0.1	-	0.3	23.6	0.5	0.1	0.6
9/2	15	15	-	-	-	0.1	0.0	-	0.1	18.6	0.2	0.0	0.2
10/1	542	542	-	-	-	0.0	0.2	-	0.2	1.3	0.0	0.2	0.2
10/2	541	541	-	-	-	0.0	0.2	-	0.2	1.3	0.0	0.2	0.2
11/1	37	37	-	-	-	0.0	0.0	-	0.0	0.9	0.0	0.0	0.0
12/1	908	908	-	-	-	0.0	0.4	-	0.4	1.7	0.0	0.4	0.4
12/2	893	893	-	-	-	0.0	0.4	-	0.4	1.7	0.0	0.4	0.4
13/1	131	131	-	-	-	0.0	0.0	-	0.0	1.0	0.0	0.0	0.0
14/1	311	311	-	-	-	0.0	0.1	-	0.1	1.1	0.0	0.1	0.1
15/1	317	317	-	-	-	0.5	0.8	-	1.3	15.2	1.0	0.8	1.9
15/2	313	313	-	-	-	0.4	0.8	-	1.2	14.2	0.7	0.8	1.5

Full Input Data And Results

C1	Stream: 1	PRC for Signalled Lanes (%):	43.2	Total Delay for Signalled Lanes (pcuHr):	6.03	Cycle Time (s):	50
C1	Stream: 2	PRC for Signalled Lanes (%):	12.0	Total Delay for Signalled Lanes (pcuHr):	4.58	Cycle Time (s):	50
C1	Stream: 3	PRC for Signalled Lanes (%):	-2.0	Total Delay for Signalled Lanes (pcuHr):	9.05	Cycle Time (s):	50
		PRC Over All Lanes (%):	-2.0	Total Delay Over All Lanes(pcuHr):	22.71		

Junctions 9

ARCADY 9 - Roundabout Module

Filename: Jct 7_A299_A28_R1_Validated_Mit_RevA - PM.j9
Path: R:\Projects\38199 Manston Airport DCO EIA\4 Design\Transport\MAY 2019 - Jucntion Moddeling - URGENT\Mitigation Schemes Models to Use\Junction 7
Report generation date: 14/06/2019 11:11:04

«Lane Simulation - PM 2039 + Dev Revised, PM
»Junction Network
»Arms
»Traffic Demand
»Origin-Destination Data
»Vehicle Mix
»Results
»Lane Results

Summary of junction performance

	PM				
	Queue (Veh)	Delay (min)	RFC	LOS	Network Residual Capacity
	Lane Simulation [Lane Simulation] - PM 2039 + Dev Revised				
1 - A28 (E)	3.3	0.21		B	% [ ]
2 - A299 (S)	4.7	0.18		B	
3 - Canterbury Road (A28 SW)	14.6	1.88		F	
4 - A299 (W)	158.7	3.65		F	
5 - Potten Street Road	0.3	0.37		C	

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.

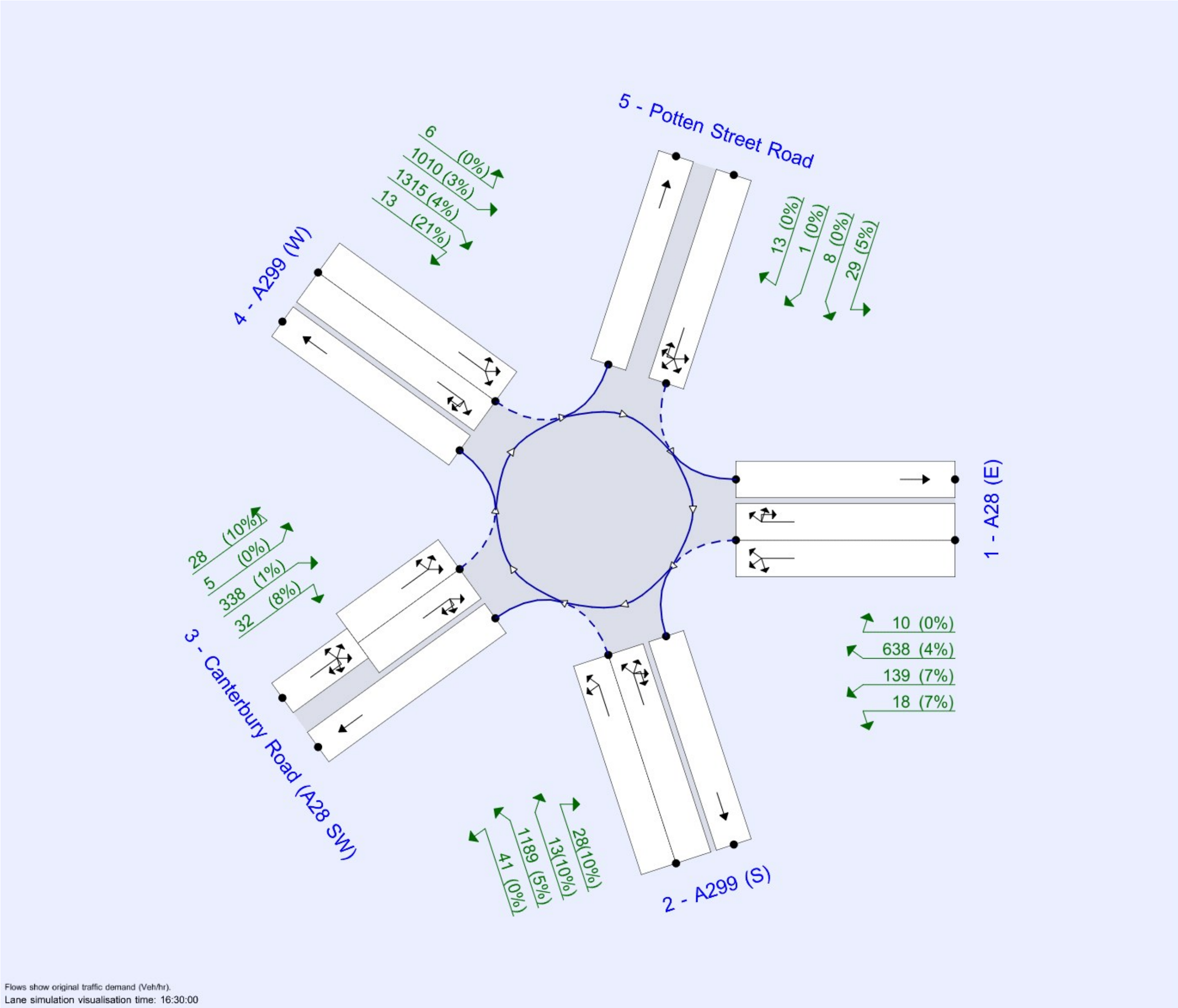
File summary

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	190	65.45

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 - PM 2039 + Dev Revised, 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	4 - A299 (W) - Lane Simulation	Arm 4: Queue at end of modelled period is greater than 10 PCU. Delay is likely to have been underestimated.
Warning	Demand Sets	D12 - PM 2039 + Dev Revised, PM	Demand Set 12: Scenario Name includes Time Period Name ('PM'). Are you sure this is correct?

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	1.99	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)	l' - 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	8.50	10.0	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	10.0	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)	0.548	2141
2 - A299 (S)	0.613	2484
3 - Canterbury Road (A28 SW)	0.462	1611
4 - A299 (W)	0.620	2660
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	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	0.274	1071
			2	0.274	1071
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	0.310	1330
			2	0.310	1330
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	✓	✓	✓	✓	✓

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
D12	PM 2039 + Dev Revised	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 - A28 (E)		ONE HOUR	✓	805	100.000
2 - A299 (S)		ONE HOUR	✓	1271	100.000
3 - Canterbury Road (A28 SW)		ONE HOUR	✓	403	100.000
4 - A299 (W)		ONE HOUR	✓	2344	100.000
5 - Potten Street Road		ONE HOUR	✓	51	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	18	139	638	10
	2 - A299 (S)	28	0	41	1189	13
	3 - Canterbury Road (A28 SW)	338	32	0	28	5
	4 - A299 (W)	1010	1315	13	0	6
	5 - Potten Street Road	29	8	1	13	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	7	4	0
	2 - A299 (S)	10	0	0	5	10
	3 - Canterbury Road (A28 SW)	1	8	0	10	0
	4 - A299 (W)	3	4	21	0	0
	5 - Potten Street Road	5	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)	0.21	3.3	B	735	1102
2 - A299 (S)	0.18	4.7	B	1165	1748
3 - Canterbury Road (A28 SW)	1.88	14.6	F	371	556
4 - A299 (W)	3.65	158.7	F	2150	3224
5 - Potten Street Road	0.37	0.3	C	48	71

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 - A28 (E)	604	151	1041	605	628	1061	0.0	1.0	0.107	A
2 - A299 (S)	969	242	611	964	1004	1035	0.0	1.5	0.084	A
3 - Canterbury Road (A28 SW)	304	76	1432	304	306	143	0.0	1.1	0.227	B
4 - A299 (W)	1763	441	321	1766	1803	1415	0.0	4.4	0.155	A
5 - Potten Street Road	41	10	2061	41	42	26	0.0	0.1	0.108	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 - A28 (E)	705	176	1233	704	746	1258	1.0	1.6	0.134	A
2 - A299 (S)	1144	286	713	1143	1190	1224	1.5	2.2	0.106	A
3 - Canterbury Road (A28 SW)	362	91	1686	364	364	171	1.1	2.0	0.316	C
4 - A299 (W)	2097	524	387	2090	2150	1663	4.4	12.7	0.311	C
5 - Potten Street Road	48	12	2444	47	46	33	0.1	0.2	0.151	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)	884	221	1374	891	927	1402	1.6	2.8	0.196	B
2 - A299 (S)	1397	349	902	1402	1465	1364	2.2	4.3	0.170	B
3 - Canterbury Road (A28 SW)	448	112	2095	423	412	208	2.0	11.1	1.076	F
4 - A299 (W)	2576	644	445	2310	2370	2073	12.7	85.5	1.357	F
5 - Potten Street Road	54	14	2721	55	55	34	0.2	0.2	0.252	C

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)	889	222	1348	884	926	1422	2.8	3.2	0.208	B
2 - A299 (S)	1399	350	895	1392	1474	1337	4.3	4.7	0.185	B
3 - Canterbury Road (A28 SW)	445	111	2074	431	440	213	11.1	14.6	1.876	F
4 - A299 (W)	2599	650	458	2289	2379	2047	85.5	158.6	3.200	F
5 - Potten Street Road	60	15	2710	61	60	38	0.2	0.3	0.370	C

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)	722	180	1362	720	762	1362	3.2	1.9	0.155	A
2 - A299 (S)	1136	284	728	1139	1211	1354	4.7	1.8	0.112	A
3 - Canterbury Road (A28 SW)	363	91	1694	378	420	173	14.6	2.4	0.814	E
4 - A299 (W)	2100	525	397	2314	2369	1675	158.6	113.6	3.652	F
5 - Potten Street Road	46	11	2678	46	50	32	0.3	0.2	0.296	C

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)	605	151	1179	607	637	1159	1.9	1.1	0.128	A
2 - A299 (S)	949	237	616	950	1004	1170	1.8	1.3	0.087	A
3 - Canterbury Road (A28 SW)	302	76	1415	304	320	151	2.4	1.0	0.240	B
4 - A299 (W)	1764	441	321	2009	2224	1398	113.6	16.4	1.459	F
5 - Potten Street Road	37	9	2301	37	41	28	0.2	0.1	0.223	B

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 - A28 (E)	Entry	1	1	2, 3, 4	332	737	0.451	333	347	0.0	0.5	0.112	A
			2	1, 4, 5	272	745	0.365	272	281	0.0	0.5	0.102	A
	Exit	1	1		1061			1061	1069	0.0	0.0	0.000	A
2 - A299 (S)	Entry	1	1	3, 4	487	998	0.489	485	505	0.0	0.7	0.083	A
			2	1, 2, 4, 5	482	997	0.483	479	499	0.0	0.8	0.085	A
	Exit	1	1		1035			1035	1066	0.0	0.0	0.000	A
3 - Canterbury Road (A28 SW)	Entry	1	1	1, 4, 5	151	358	0.422	151	153	0.0	0.6	0.224	B
			2	1, 2, 3	152	361	0.422	153	153	0.0	0.5	0.223	B
		2	1	(1, 2, 3, 4, 5)	304			303	310	0.0	0.0	0.004	A
	Exit	1	1		143			143	151	0.0	0.0	0.000	A
4 - A299 (W)	Entry	1	1	1, 2, 5	1009	1188	0.849	1013	1032	0.0	3.1	0.184	B
			2	2, 3, 4	754	1180	0.639	753	771	0.0	1.3	0.115	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	41	615	0.067	41	42	0.0	0.1	0.108	A
	Exit	1	1		26			26	25	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 - A28 (E)	Entry	1	1	2, 3, 4	378	683	0.554	378	403	0.5	0.9	0.142	A
			2	1, 4, 5	327	687	0.476	326	342	0.5	0.7	0.125	A
	Exit	1	1		1258			1258	1267	0.0	0.0	0.000	A
2 - A299 (S)	Entry	1	1	3, 4	576	969	0.594	576	597	0.7	1.1	0.105	A
			2	1, 2, 4, 5	568	966	0.587	567	593	0.8	1.2	0.107	A
	Exit	1	1		1224			1224	1272	0.0	0.0	0.000	A
3 - Canterbury Road (A28 SW)	Entry	1	1	1, 4, 5	183	311	0.588	184	182	0.6	0.9	0.293	C
			2	1, 2, 3	181	311	0.583	180	182	0.5	1.0	0.294	C
		2	1	(1, 2, 3, 4, 5)	362			364	368	0.0	0.2	0.022	A
	Exit	1	1		171			171	184	0.0	0.0	0.000	A
4 - A299 (W)	Entry	1	1	1, 2, 5	1125	1168	0.963	1122	1151	3.1	8.0	0.376	C
			2	2, 3, 4	973	1155	0.843	968	1000	1.3	4.7	0.236	B
	Exit	1	1		1663			1663	1742	0.0	0.0	0.000	A
5 - Potten Street Road	Entry	1	1	1, 2, 3, 4, 5	48	414	0.115	47	46	0.1	0.2	0.151	A
	Exit	1	1		33			33	31	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	464	647	0.716	467	490	0.9	1.6	0.206	B
			2	1, 4, 5	421	652	0.645	424	438	0.7	1.2	0.184	B
	Exit	1	1		1402			1402	1409	0.0	0.0	0.000	A
2 - A299 (S)	Entry	1	1	3, 4	702	913	0.769	704	735	1.1	2.1	0.169	B
			2	1, 2, 4, 5	695	902	0.770	697	731	1.2	2.2	0.171	B
	Exit	1	1		1364			1364	1409	0.0	0.0	0.000	A
3 - Canterbury Road (A28 SW)	Entry	1	1	1, 4, 5	212	233	0.906	211	206	0.9	2.3	0.561	D
			2	1, 2, 3	213	234	0.912	212	206	1.0	2.3	0.553	D
		2	1	(1, 2, 3, 4, 5)	448			425	423	0.2	6.6	0.508	D
	Exit	1	1		208			208	223	0.0	0.0	0.000	A
4 - A299 (W)	Entry	1	1	1, 2, 5	1297	1152	1.125	1161	1193	8.0	45.8	1.480	F
			2	2, 3, 4	1279	1140	1.120	1149	1178	4.7	39.7	1.230	F
	Exit	1	1		2073			2073	2152	0.0	0.0	0.000	A
5 - Potten Street Road	Entry	1	1	1, 2, 3, 4, 5	54	279	0.195	55	55	0.2	0.2	0.252	C
	Exit	1	1		34			34	37	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	475	649	0.732	474	493	1.6	1.7	0.217	B
			2	1, 4, 5	414	658	0.631	410	433	1.2	1.5	0.199	B
	Exit	1	1		1422			1422	1452	0.0	0.0	0.000	A
2 - A299 (S)	Entry	1	1	3, 4	706	913	0.773	703	736	2.1	2.3	0.184	B
			2	1, 2, 4, 5	693	907	0.763	689	737	2.2	2.3	0.185	B
	Exit	1	1		1337			1337	1404	0.0	0.0	0.000	A
3 - Canterbury Road (A28 SW)	Entry	1	1	1, 4, 5	216	238	0.909	217	219	2.3	2.3	0.661	E
			2	1, 2, 3	215	238	0.904	214	221	2.3	2.4	0.647	E
		2	1	(1, 2, 3, 4, 5)	445			431	440	6.6	9.9	1.227	F
	Exit	1	1		213			213	228	0.0	0.0	0.000	A
4 - A299 (W)	Entry	1	1	1, 2, 5	1317	1149	1.146	1160	1192	45.8	83.0	3.352	F
			2	2, 3, 4	1281	1134	1.129	1128	1187	39.7	75.7	3.046	F
	Exit	1	1		2047			2047	2155	0.0	0.0	0.000	A
5 - Potten Street Road	Entry	1	1	1, 2, 3, 4, 5	60	283	0.211	61	60	0.2	0.3	0.370	C
	Exit	1	1		38			38	39	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	392	647	0.606	391	411	1.7	1.1	0.163	A
			2	1, 4, 5	329	657	0.502	329	351	1.5	0.8	0.145	A
	Exit	1	1		1362			1362	1417	0.0	0.0	0.000	A
2 - A299 (S)	Entry	1	1	3, 4	563	962	0.586	565	604	2.3	0.9	0.112	A
			2	1, 2, 4, 5	573	957	0.599	574	607	2.3	0.9	0.112	A
	Exit	1	1		1354			1354	1397	0.0	0.0	0.000	A
3 - Canterbury Road (A28 SW)	Entry	1	1	1, 4, 5	186	308	0.605	188	210	2.3	1.0	0.425	D
			2	1, 2, 3	186	308	0.603	190	210	2.4	0.9	0.423	D
		2	1	(1, 2, 3, 4, 5)	363			373	409	9.9	0.4	0.416	C
	Exit	1	1		173			173	189	0.0	0.0	0.000	A
4 - A299 (W)	Entry	1	1	1, 2, 5	1056	1165	0.905	1164	1182	83.0	60.1	3.830	F
			2	2, 3, 4	1044	1156	0.905	1150	1187	75.7	53.4	3.474	F
	Exit	1	1		1675			1675	1776	0.0	0.0	0.000	A
5 - Potten Street Road	Entry	1	1	1, 2, 3, 4, 5	46	298	0.153	46	50	0.3	0.2	0.296	C
	Exit	1	1		32			32	33	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	331	695	0.476	332	349	1.1	0.7	0.135	A
			2	1, 4, 5	274	706	0.388	275	288	0.8	0.5	0.120	A
	Exit	1	1		1159			1159	1264	0.0	0.0	0.000	A
2 - A299 (S)	Entry	1	1	3, 4	473	994	0.476	475	501	0.9	0.6	0.087	A
			2	1, 2, 4, 5	476	987	0.482	475	503	0.9	0.7	0.087	A
	Exit	1	1		1170			1170	1300	0.0	0.0	0.000	A
3 - Canterbury Road (A28 SW)	Entry	1	1	1, 4, 5	152	361	0.422	153	160	1.0	0.4	0.233	B
			2	1, 2, 3	150	361	0.416	150	160	0.9	0.6	0.230	B
		2	1	(1, 2, 3, 4, 5)	302			302	316	0.4	0.0	0.010	A
	Exit	1	1		151			151	158	0.0	0.0	0.000	A
4 - A299 (W)	Entry	1	1	1, 2, 5	956	1192	0.802	1088	1165	60.1	9.7	1.515	F
			2	2, 3, 4	808	1178	0.686	921	1059	53.4	6.7	1.396	F
	Exit	1	1		1398			1398	1475	0.0	0.0	0.000	A
5 - Potten Street Road	Entry	1	1	1, 2, 3, 4, 5	37	490	0.074	37	41	0.2	0.1	0.223	B
	Exit	1	1		28			28	29	0.0	0.0	0.000	A

Junctions 9

PICADY 9 - Priority Intersection Module

Filename: Jct 10_B2050_Margate Hill_R1 Validated_MIT_CM.j9
Path: V:\Projects\38199 Manston Airport DCO EIA\4 Design\Transport\MAY 2019 - Jucntion Moddeling - URGENT\Mitigation Schemes Models to Use\Jucntion 10
Report generation date: 20/05/2019 11:25:26

»Mitigation - 2039 + Dev Traffic, AM
»Mitigation - 2039 + Dev 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
	Mitigation - 2039 + Dev Traffic											
Stream B-ACD	1.1	0.29	0.53	C	3.63	-29 % [Stream D-BC]	51.5	5.22	1.17	F	2.09	-25 % [Stream B-ACD]
Stream A-BCD	0.7	0.15	0.37	A			1.7	0.24	0.58	B		
Stream D-A	25.1	8.73	1.26	F			0.4	0.22	0.30	B		
Stream D-BC	56.2	8.35	1.27	F			1.6	0.50	0.62	D		
Stream C-ABD	0.0	0.09	0.00	A			0.0	0.08	0.01	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.

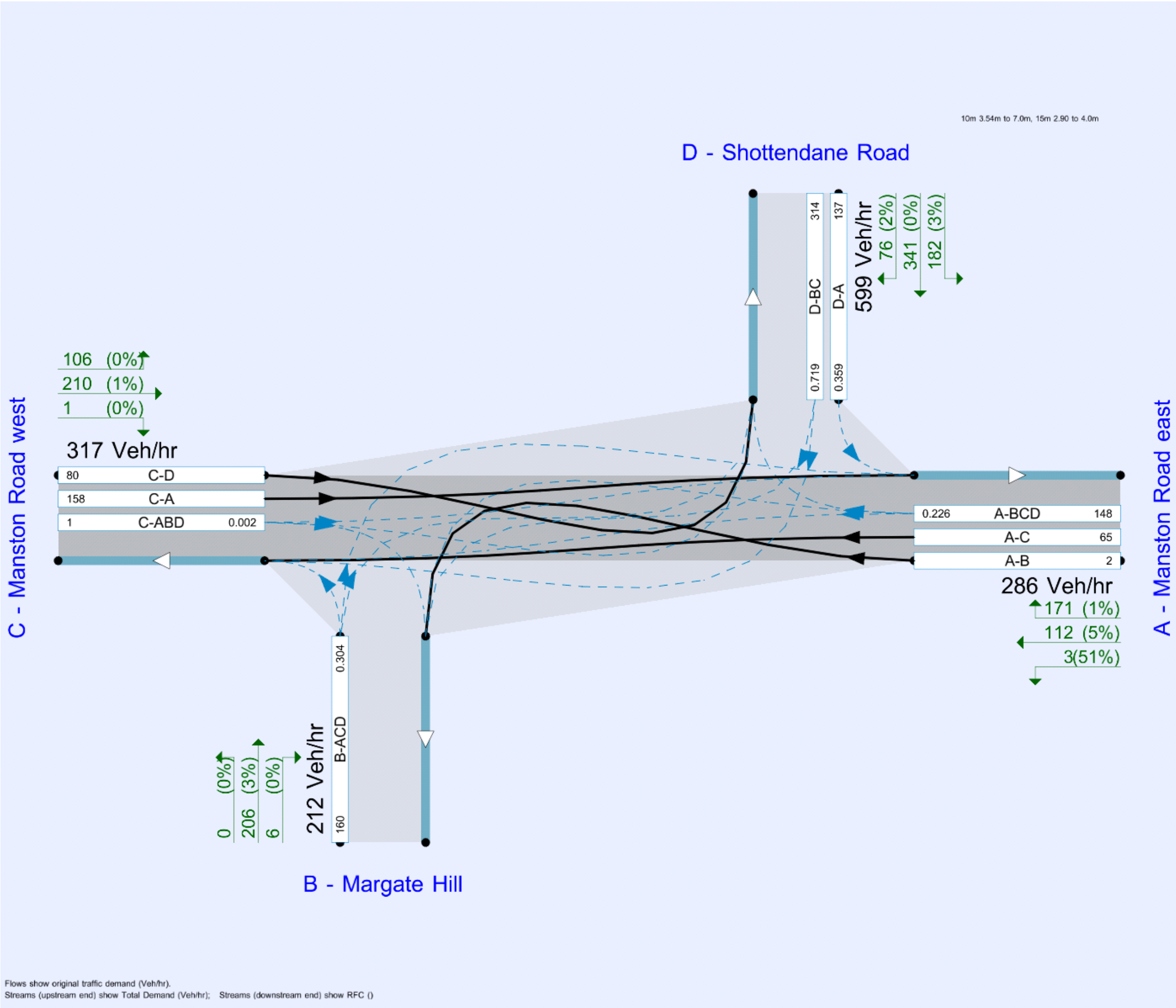
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	29/09/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\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	Residual capacity criteria type	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75			✓	Delay	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
D9	2039 + Dev Traffic	AM	ONE HOUR	07:30	09:00	15	✓
D10	2039 + Dev Traffic	PM	ONE HOUR	16:30	18:00	15	✓

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A2	Mitigation	✓	100.000	100.000

Mitigation - 2039 + Dev Traffic, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Major arm width	C - Manston Road west - Major arm geometry	For two-way major roads, please interpret results with caution if the total major carriageway width is less than 6m.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (min)	Junction LOS
10	untitled	Right-Left Stagger	Two-way		3.63	F

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-29	Stream D-BC

Arms

Arms

Arm	Name	Description	Arm type
A	Manston Road east		Major
B	Margate Hill		Minor
C	Manston Road west		Major
D	Shottendane Road		Minor

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)
A - Manston Road east	6.04			250.0	✓	0.00
C - Manston Road west	4.12			195.0	✓	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)	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 - Margate Hill	One lane	4.00								160	160
D - Shottendane Road	One lane plus flare		10.00	8.32	5.94	4.58	3.67	✓	2.00	18	56

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for A-D	Slope for B-A	Slope for B-D	Slope for C-A	Slope for C-B	Slope for C-D	Slope for D-B	Slope for D-C
10	A-D	719	-	-	-	0.278	0.278	0.278	-	0.278	-	-
10	B-AD	675	0.133	0.336	-	-	-	0.211	0.480	0.211	0.133	0.336
10	B-C	797	0.132	0.334	-	-	-	-	-	-	0.132	0.334
10	C-B	687	0.288	0.288	-	-	-	-	-	-	0.288	0.288
10	D-A	652	-	-	-	0.252	0.100	0.252	-	0.100	-	-
10	D-BC	578	0.167	0.167	0.380	0.266	0.105	0.266	-	0.105	-	-

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
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 (%)
A - Manston Road east		ONE HOUR	✓	286	100.000
B - Margate Hill		ONE HOUR	✓	212	100.000
C - Manston Road west		ONE HOUR	✓	317	100.000
D - Shottendane Road		ONE HOUR	✓	599	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A - Manston Road east	B - Margate Hill	C - Manston Road west	D - Shottendane Road
From	A - Manston Road east	0	3	112	171
	B - Margate Hill	6	0	0	206
	C - Manston Road west	210	1	0	106
	D - Shottendane Road	182	341	76	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A - Manston Road east	B - Margate Hill	C - Manston Road west	D - Shottendane Road
From	A - Manston Road east	0	51	5	1
	B - Margate Hill	0	0	0	3
	C - Manston Road west	1	0	0	0
	D - Shottendane Road	3	0	2	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-ACD	0.53	0.29	1.1	C	195	292
A-BCD	0.37	0.15	0.7	A	189	284
A-B					2	3
A-C					71	107
D-A	1.26	8.73	25.1	F	167	251
D-BC	1.27	8.35	56.2	F	383	574
C-ABD	0.00	0.09	0.0	A	2	2
C-D					97	146
C-A					192	288

Main Results for each time segment

07:30 - 07:45

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-ACD	160	40	525	0.304	158	0.0	0.4	0.163	A
A-BCD	148	37	656	0.226	147	0.0	0.3	0.118	A
A-B	2	0.44			2				
A-C	65	16			65				
D-A	137	34	381	0.359	135	0.0	0.5	0.241	B
D-BC	314	78	437	0.719	305	0.0	2.3	0.429	D
C-ABD	1	0.28	732	0.002	1	0.0	0.0	0.082	A
C-D	80	20			80				
C-A	158	39			158				

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-ACD	191	48	498	0.383	190	0.4	0.6	0.194	B
A-BCD	183	46	647	0.283	183	0.3	0.4	0.129	A
A-B	2	0.48			2				
A-C	72	18			72				
D-A	164	41	204	0.804	154	0.5	3.0	1.062	F
D-BC	375	94	400	0.938	356	2.3	7.0	1.076	F
C-ABD	1	0.36	742	0.002	1	0.0	0.0	0.081	A
C-D	95	24			95				
C-A	188	47			188				

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-ACD	233	58	459	0.508	232	0.6	1.0	0.262	C
A-BCD	236	59	634	0.372	235	0.4	0.7	0.150	A
A-B	2	0.52			2				
A-C	77	19			77				
D-A	200	50	159	1.264	153	3.0	14.8	4.144	F
D-BC	459	115	364	1.262	360	7.0	31.8	3.620	F
C-ABD	2	0.51	757	0.003	2	0.0	0.0	0.079	A
C-D	116	29			116				
C-A	231	58			231				

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-ACD	233	58	443	0.527	233	1.0	1.1	0.286	C
A-BCD	236	59	634	0.372	236	0.7	0.7	0.151	A
A-B	2	0.52			2				
A-C	77	19			77				
D-A	200	50	161	1.248	159	14.8	25.1	7.921	F
D-BC	459	115	363	1.266	362	31.8	56.2	7.400	F
C-ABD	2	0.53	733	0.003	2	0.0	0.0	0.082	A
C-D	116	29			116				
C-A	231	58			231				

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-ACD	191	48	462	0.413	192	1.1	0.7	0.224	B
A-BCD	183	46	646	0.284	184	0.7	0.5	0.131	A
A-B	2	0.48			2				
A-C	72	18			72				
D-A	164	41	174	0.942	167	25.1	24.3	8.729	F
D-BC	375	94	394	0.951	387	56.2	53.1	8.347	F
C-ABD	2	0.38	689	0.002	2	0.0	0.0	0.087	A
C-D	95	24			95				
C-A	188	47			188				

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-ACD	160	40	489	0.326	161	0.7	0.5	0.183	B
A-BCD	149	37	656	0.227	149	0.5	0.3	0.119	A
A-B	2	0.44			2				
A-C	65	16			65				
D-A	137	34	185	0.740	178	24.3	14.1	6.608	F
D-BC	314	78	416	0.754	408	53.1	29.4	6.128	F
C-ABD	1	0.29	679	0.002	1	0.0	0.0	0.089	A
C-D	80	20			80				
C-A	158	39			158				

Mitigation - 2039 + Dev Traffic, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Major arm width	C - Manston Road west - Major arm geometry	For two-way major roads, please interpret results with caution if the total major carriageway width is less than 6m.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (min)	Junction LOS
10	untitled	Right-Left Stagger	Two-way		2.09	F

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-25	Stream B-ACD

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 (%)
A - Manston Road east		ONE HOUR	✓	381	100.000
B - Margate Hill		ONE HOUR	✓	545	100.000
C - Manston Road west		ONE HOUR	✓	241	100.000
D - Shottendane Road		ONE HOUR	✓	285	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A - Manston Road east	B - Margate Hill	C - Manston Road west	D - Shottendane Road
From	A - Manston Road east	0	13	159	209
	B - Margate Hill	18	0	0	527
	C - Manston Road west	142	3	0	96
	D - Shottendane Road	108	134	43	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A - Manston Road east	B - Margate Hill	C - Manston Road west	D - Shottendane Road
From	A - Manston Road east	0	0	1	0
	B - Margate Hill	0	0	0	1
	C - Manston Road west	1	0	0	0
	D - Shottendane Road	1	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-ACD	1.17	5.22	51.5	F	500	750
A-BCD	0.58	0.24	1.7	B	264	396
A-B					6	10
A-C					79	119
D-A	0.30	0.22	0.4	B	99	149
D-BC	0.62	0.50	1.6	D	162	244
C-ABD	0.01	0.08	0.0	A	4	6
C-D					88	131
C-A					130	194

Main Results for each time segment

16:30 - 16:45

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-ACD	410	103	564	0.728	401	0.0	2.5	0.349	C
A-BCD	197	49	643	0.307	195	0.0	0.5	0.134	A
A-B	7	2			7				
A-C	83	21			83				
D-A	81	20	527	0.154	81	0.0	0.2	0.134	A
D-BC	133	33	404	0.330	131	0.0	0.5	0.218	B
C-ABD	3	0.75	729	0.004	3	0.0	0.0	0.083	A
C-D	72	18			72				
C-A	106	27			106				

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-ACD	490	122	543	0.902	475	2.5	6.2	0.750	E
A-BCD	250	62	629	0.397	249	0.5	0.8	0.158	A
A-B	7	2			7				
A-C	86	21			86				
D-A	97	24	489	0.198	97	0.2	0.2	0.153	A
D-BC	159	40	371	0.429	158	0.5	0.7	0.280	C
C-ABD	4	0.95	738	0.005	4	0.0	0.0	0.082	A
C-D	86	21			86				
C-A	127	32			127				

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-ACD	600	150	515	1.166	507	6.2	29.5	2.437	F
A-BCD	335	84	610	0.549	332	0.8	1.5	0.215	B
A-B	6	2			6				
A-C	78	20			78				
D-A	119	30	414	0.287	118	0.2	0.4	0.202	B
D-BC	195	49	325	0.600	192	0.7	1.4	0.443	D
C-ABD	5	1	752	0.007	5	0.0	0.0	0.080	A
C-D	105	26			105				
C-A	155	39			155				

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-ACD	600	150	514	1.168	512	29.5	51.5	4.940	F
A-BCD	342	86	587	0.582	341	1.5	1.7	0.245	B
A-B	6	1			6				
A-C	72	18			72				
D-A	119	30	394	0.302	119	0.4	0.4	0.218	B
D-BC	195	49	314	0.621	194	1.4	1.6	0.499	D
C-ABD	5	1	751	0.007	5	0.0	0.0	0.080	A
C-D	105	26			105				
C-A	155	39			155				

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-ACD	490	122	542	0.904	531	51.5	41.1	5.225	F
A-BCD	258	65	580	0.446	261	1.7	1.0	0.191	B
A-B	6	2			6				
A-C	78	19			78				
D-A	97	24	460	0.211	98	0.4	0.3	0.166	A
D-BC	159	40	349	0.456	162	1.6	0.9	0.326	C
C-ABD	4	0.95	736	0.005	4	0.0	0.0	0.082	A
C-D	86	21			86				
C-A	127	32			127				

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-ACD	410	103	563	0.729	550	41.1	6.3	2.746	F
A-BCD	201	50	601	0.335	203	1.0	0.6	0.152	A
A-B	6	2			6				
A-C	79	20			79				
D-A	81	20	506	0.161	82	0.3	0.2	0.142	A
D-BC	133	33	385	0.346	135	0.9	0.5	0.240	B
C-ABD	3	0.75	727	0.004	3	0.0	0.0	0.083	A
C-D	72	18			72				
C-A	106	27			106				

LinSig V1 style report

User and Project Details

Project:	
Title:	
Location:	
File name:	Junction 2 Signal with Pedestrian crossings_R5 AF - PM.lsg3x
Author:	
Company:	
Address:	
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
D	Traffic		7	7
E	Filter	C	4	0
F	Ind. Arrow	A	4	4
G	Pedestrian		6	6

Phase Intergreens Matrix

	Starting Phase							
		A	B	C	D	E	F	G
Terminating Phase	A		-	5	8	-	-	-
	B	-		6	6	6	5	-
	C	9	7		-	-	9	11
	D	6	6	-		6	5	9
	E	-	7	-	6		-	11
	F	-	6	5	8	-		-
	G	12	12	-	-	-	-	

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		9	9	11
	2	8		6	0
	3	11	X		X
	4	2	12	X	

Phases in Stage

Stage No.	Phases in Stage
1	C D
2	A B
3	A E F
4	G

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	3/1	1.09	To 5/1 (Left) To 6/1 (Ahead)	6.00	-	0.50	6	3.00
2/1 (Manston Road West_ Entry)	6/1 (Right)	1439	0	4/2	1.09	To 7/1 (Ahead)	1.00	1.00	0.50	1	1.00
				4/1	1.09	All					
3/1 (Manston Road North_ Entry)	7/1 (Right)	1439	0	1/1	1.09	All	3.00	3.00	0.50	3	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	5.00	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	7.0	Geom	-	3.00	0.00	Y	Arm 7 Left	21.50
											Arm 8 Ahead	Inf
1/2 (Spitfire Way_Entry)	O	A F	2	3	60.0	Geom	-	3.00	0.00	Y	Arm 5 Right	20.00
2/1 (Manston Road West_ Entry)	O	D	2	3	60.0	Geom	-	3.00	0.00	Y	Arm 5 Ahead	64.00
											Arm 6 Right	20.00
											Arm 8 Left	16.50
3/1 (Manston Road North_ Entry)	O	B	2	3	60.0	Geom	-	3.45	0.00	Y	Arm 5 Left	11.50
											Arm 6 Ahead	Inf
											Arm 7 Right	10.00
4/1 (Manston Road East_ Entry)	U	C E	2	3	60.0	Geom	-	3.00	0.00	Y	Arm 6 Left	31.50
4/2 (Manston Road East_ Entry)	O	C	2	3	14.0	Geom	-	3.00	0.00	Y	Arm 7 Ahead	64.00
											Arm 8 Right	8.00
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	-	-	-	-	-	-

Lane Saturation Flows

Scenario 1: '2039 Growthed Future Baseline + Development - PM Peak with Ped' (FG1: '2039 Growthed Future Baseline + Development - PM Peak ', Plan 12: '2039 Growthed Future Baseline + Development - PM Peak with Ped')

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)	3.00	0.00	Y	Arm 7 Left	21.50	2.9 %	1911	1911
				Arm 8 Ahead	Inf	97.1 %		
1/2 (Spitfire Way_Entry)	3.00	0.00	Y	Arm 5 Right	20.00	100.0 %	1781	1781
2/1 (Manston Road West_ Entry)	3.00	0.00	Y	Arm 5 Ahead	64.00	85.3 %	1854	1854
				Arm 6 Right	20.00	4.0 %		
				Arm 8 Left	16.50	10.6 %		
3/1 (Manston Road North_ Entry)	3.45	0.00	Y	Arm 5 Left	11.50	36.3 %	1832	1832
				Arm 6 Ahead	Inf	48.7 %		
				Arm 7 Right	10.00	14.9 %		
4/1 (Manston Road East_ Entry)	3.00	0.00	Y	Arm 6 Left	31.50	100.0 %	1828	1828
4/2 (Manston Road East_ Entry)	3.00	0.00	Y	Arm 7 Ahead	64.00	81.6 %	1817	1817
				Arm 8 Right	8.00	18.4 %		
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

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2039 Growthed Future Baseline + Development - PM Peak '	16:45	17:45	01:00	

Traffic Flows, Desired

FG1: '2039 Growthed Future Baseline + Development - PM Peak '
Desired Flow :

	Destination					
		A	B	C	D	Tot.
Origin	A	0	386	372	84	842
	B	364	0	8	264	636
	C	233	11	0	29	273
	D	173	232	71	0	476
	Tot.	770	629	451	377	2227

Stage Timings

Scenario 1: '2039 Growthed Future Baseline + Development - PM Peak with Ped' (FG1: '2039 Growthed Future Baseline + Development - PM Peak ', Plan 12: '2039 Growthed Future Baseline + Development - PM Peak with Ped')

Stage	1	4	2	3	1	2	3
Duration	30	6	27	16	38	52	5
Change Point	0	41	58	97	119	168	229

LinSig V1 style report

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**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**86.5%**
Junction 2	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**86.5%**
1/2+1/1	Spitfire Way_Entry Right Left Ahead	O+U	N/A	N/A	A	F	2	112	23	636	1781:1911	421+315	86.4 : 86.4%
2/1	Manston Road West_ Entry Ahead Right Left	O	N/A	N/A	D		2	68	-	273	1854	541	50.5%
3/1	Manston Road North_ Entry Left Ahead Right	O	N/A	N/A	B		2	81	-	476	1832	634	75.1%
4/1+4/2	Manston Road East_ Entry Left Ahead Right	U+O	N/A	N/A	C	E	2	111:80	31	842	1828:1817	446+527	86.5 : 86.5%
5/1	Manston Road East_ Exit	U	N/A	N/A	-		-	-	-	770	Inf	Inf	0.0%
6/1	Spitfire Way_Exit	U	N/A	N/A	-		-	-	-	629	Inf	Inf	0.0%
7/1	Manston Road West_ Exit	U	N/A	N/A	-		-	-	-	451	Inf	Inf	0.0%
8/1	Manston Road North_ Exit	U	N/A	N/A	-		-	-	-	377	Inf	Inf	0.0%

LinSig V1 style report

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	**-**	**-**	**277**	**210**	**43**	**18.1**	**8.1**	**1.9**	**28.0**	**-**	**-**	**-**	**-**
Junction 2	**-**	**-**	**277**	**210**	**43**	**18.1**	**8.1**	**1.9**	**28.0**	**-**	**-**	**-**	**-**
1/2+1/1	636	636	116	207	41	4.1	3.0	1.7	8.8	49.7	11.0	3.0	14.0
2/1	273	273	11	0	0	2.7	0.5	0.0	3.2	42.6	7.8	0.5	8.3
3/1	476	476	71	0	0	4.6	1.5	0.0	6.1	46.3	14.3	1.5	15.8
4/1+4/2	842	842	79	3	2	6.7	3.1	0.2	9.9	42.4	13.8	3.1	16.9
5/1	770	770	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	629	629	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	451	451	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	377	377	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

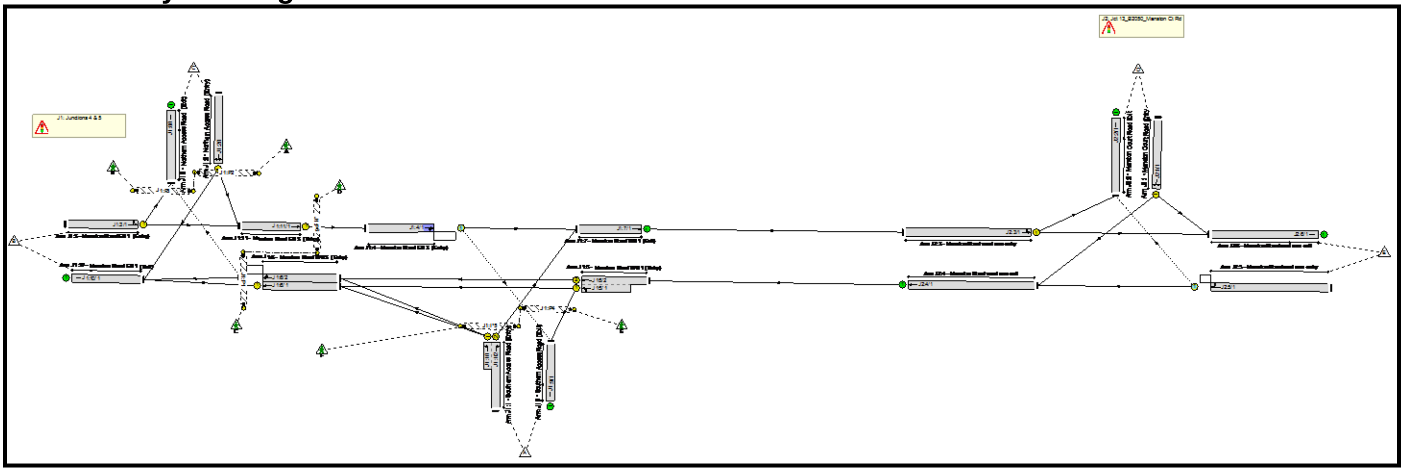
C1 PRC for Signalled Lanes (%): 4.0 Total Delay for Signalled Lanes (pcuHr): 28.04 Cycle Time (s): 240
PRC Over All Lanes (%): 4.0 Total Delay Over All Lanes(pcuHr): 28.04

Full Input Data And Results

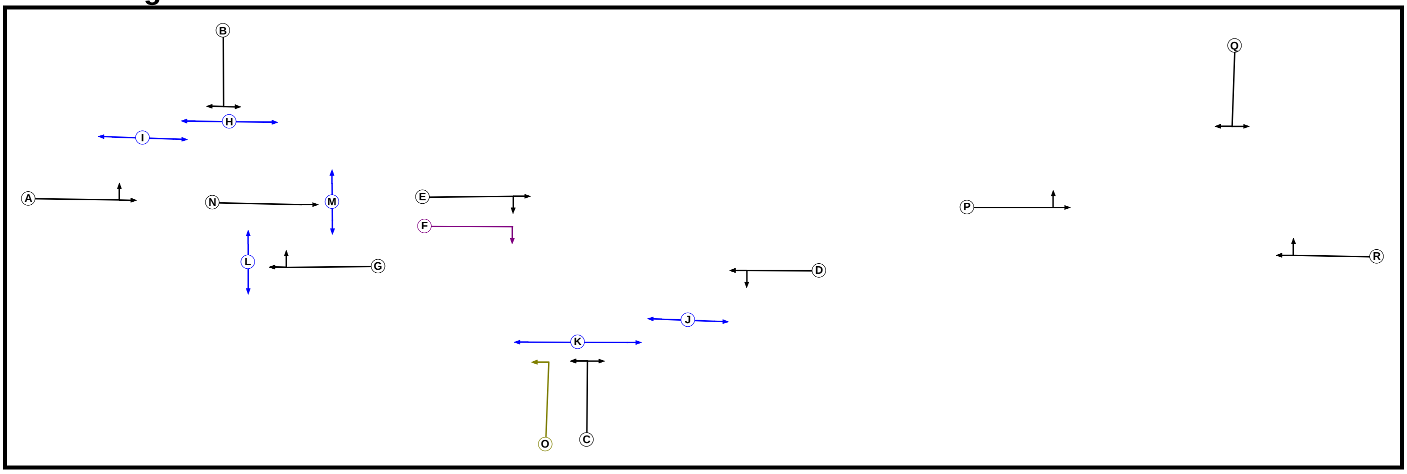
User and Project Details

Project:	**Manston Airport DCO EIA**
Title:	**Junctions 4+5 Staggered**
Location:	
File name:	Signalised_R12 - PM.lsg3x
Author:	Fouda
Company:	AmecFW
Address:	
Notes:	

Network Layout Diagram



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	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
P	Traffic		7	7
Q	Traffic		7	7
R	Traffic		7	7

Full Input Data And Results

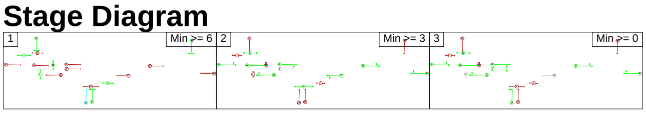
Phase Intergreens Matrix

		Starting Phase																	
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
Terminating Phase	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	-	-	-		-	-	-
	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		6	-
	Q	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6		6
	R	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	

Phases in Stage

Stage No.	Phases in Stage
1	B C I J L M Q
2	A D E G H K N P R
3	A E F G H N O P R

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	8	8
3	1	G	Losing	3	3
3	1	N	Losing	6	6
3	1	P	Losing	19	19
3	1	Q	Gaining absolute	0	0

Prohibited Stage Change

	To Stage			
		1	2	3
From Stage	1		16	15
	2	21		8
	3	25	X	

Full Input Data And Results

Give-Way Lane Input Data

Junction: J1: 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)**
J1:4/1 (Manston Road EB 3 (Entry))	J1:9/1 (Right)	1439	0	J1:5/2	1.09	All	4.00	4.00	0.50	4	3.00
				J1:5/1	1.09	All					
J1:6/2 (Manston Road WB 3 (Entry))	J1:8/1 (Right)	1439	0	J1:3/1	1.09	All	3.00	3.00	0.50	3	3.00

Junction: J2: Jct 13_B2050_Manston Ct 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)**
J2:5/1 (Manston Road east arm entry)	J2:2/1 (Right)	1439	0	J2:3/1	1.09	All	2.00	2.00	0.50	2	2.00

Full Input Data And Results
Lane Input Data

Junction: J1: 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)**
J1:1/1 (Southern Access Road (Entry))	U	C O	2	3	5.0	Geom	-	3.50	0.00	Y	Arm J1:6 Left	Inf
J1:1/2 (Southern Access Road (Entry))	U	C	2	3	60.0	Geom	-	3.50	0.00	Y	Arm J1:7 Right	Inf
J1:2/1 (Northern Access Road (Entry))	U	B	2	3	60.0	Geom	-	3.50	0.00	Y	Arm J1:10 Right	20.00
											Arm J1:11 Left	20.00
J1:3/1 (Manston Road EB 1 (Entry))	U	A	2	3	60.0	Geom	-	3.50	0.00	Y	Arm J1:8 Left	Inf
											Arm J1:11 Ahead	Inf
J1:4/1 (Manston Road EB 3 (Entry))	O	E F	2	3	10.0	Geom	-	3.50	0.00	Y	Arm J1:7 Ahead	Inf
											Arm J1:9 Right	20.00
J1:5/1 (Manston Road WB 1 (Entry))	U	D	2	3	9.0	Geom	-	3.25	0.00	Y	Arm J1:6 Ahead	Inf
											Arm J1:9 Left	15.00
J1:5/2 (Manston Road WB 1 (Entry))	U	D	2	3	60.0	Geom	-	3.50	0.00	Y	Arm J1:6 Ahead	Inf
J1:6/1 (Manston Road WB 3 (Entry))	U	G	2	3	60.0	Geom	-	3.25	0.00	Y	Arm J1:10 Ahead	Inf
J1:6/2 (Manston Road WB 3 (Entry))	O	G	2	3	60.0	Geom	-	3.50	0.00	Y	Arm J1:8 Right	Inf
											Arm J1:10 Ahead	Inf
J1:7/1 (Manston Road WB 1 (Exit))	U		2	3	60.0	Inf	-	-	-	-	-	-

J1:8/1 (Northern Access Road (Exit))	U		2	3	60.0	Inf	-	-	-	-	-	-
J1:9/1 (Southern Access Road (Exit))	U		2	3	60.0	Inf	-	-	-	-	-	-
J1:10/1 (Manston Road EB 1 (Exit))	U		2	3	60.0	Inf	-	-	-	-	-	-
J1:11/1 (Manston Road EB 3 (Entry))	U	N	2	3	60.0	Geom	-	3.50	0.00	Y	Arm J1:4 Ahead	Inf

Junction: J2: Jct 13_B2050_Manston Ct 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)
J2:1/1 (Manston Court Road Entry)	U	Q	2	3	60.0	Geom	-	3.11	0.00	Y	Arm J2:4 Right	15.00
											Arm J2:6 Left	15.00
J2:2/1 (Manston Court Road Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
J2:3/1 (Manston Road west arm entry)	U	P	2	3	60.0	Geom	-	3.00	0.00	Y	Arm J2:2 Left	12.00
											Arm J2:6 Ahead	Inf
J2:4/1 (Manston Road west arm exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
J2:5/1 (Manston Road east arm entry)	O	R	2	3	60.0	Geom	-	2.50	0.00	Y	Arm J2:2 Right	15.00
											Arm J2:4 Ahead	Inf
J2:6/1 (Manston Road east arm exit)	U		2	3	60.0	Inf	-	-	-	-	-	-

Full Input Data And Results

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2039 Growthed Traffic Airport Peak'	13:00	14:00	01:00	
2: '2039 Growthed Traffic AM'	08:00	09:00	01:00	
3: '2039 Growthed Traffic PM'	17:00	18:00	01:00	
4: '2039 + Dev Traffic AM'	08:00	09:00	01:00	
5: '2039 + Dev Traffic PM'	17:00	18:00	01:00	
6: '2039 + Dev Traffic Airport Peak'	13:00	14:00	01:00	
7: '2039 B+Dev - Net change - AM'	08:00	09:00	01:00	
8: '2039 B+Dev - Net change - PM'	17:00	18:00	01:00	
9: '2039 B+Dev - Net change - Airport Peak'	13:00	14:00	01:00	

Scenario 1: '2039 + Dev Traffic PM' (FG5: '2039 + Dev Traffic PM', Plan 1: '2039 Growthed Traffic Airport Peak')

Traffic Flows, Desired

Desired Flow :

		Destination					
		A	B	C	D	E	Tot.
Origin	A	0	63	0	14	53	130
	B	53	0	15	155	544	767
	C	0	69	0	0	125	194
	D	0	179	2	0	17	198
	E	21	534	6	18	0	579
	Tot.	74	845	23	187	739	1868

Traffic Lane Flows

Lane	Scenario 1: 2039 + Dev Traffic PM
Junction: J1: Junctions 4 && 5	
J1:1/1 (short)	63
J1:1/2 (with short)	130(In) 67(Out)
J1:2/1	194
J1:3/1	767
J1:4/1	877
J1:5/1 (short)	412
J1:5/2 (with short)	742(In) 330(Out)
J1:6/1	435
J1:6/2	349
J1:7/1	891
J1:8/1	23
J1:9/1	74
J1:10/1	845
J1:11/1	877
Junction: J2: Jct 13_B2050_Manston Ct Rd	
J2:1/1	198
J2:2/1	187
J2:3/1	891
J2:4/1	742
J2:5/1	579
J2:6/1	739

Lane Saturation Flows

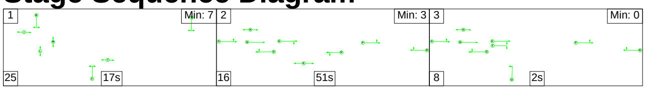
Junction: J1: Junctions 4 && 5								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J1:1/1 (Southern Access Road (Entry))	3.50	0.00	Y	Arm J1:6 Left	Inf	100.0 %	1965	1965
J1:1/2 (Southern Access Road (Entry))	3.50	0.00	Y	Arm J1:7 Right	Inf	100.0 %	1965	1965
J1:2/1 (Northern Access Road (Entry))	3.50	0.00	Y	Arm J1:10 Right	20.00	35.6 %	1828	1828
				Arm J1:11 Left	20.00	64.4 %		
J1:3/1 (Manston Road EB 1 (Entry))	3.50	0.00	Y	Arm J1:8 Left	Inf	2.0 %	1965	1965
				Arm J1:11 Ahead	Inf	98.0 %		
J1:4/1 (Manston Road EB 3 (Entry))	3.50	0.00	Y	Arm J1:7 Ahead	Inf	94.0 %	1956	1956
				Arm J1:9 Right	20.00	6.0 %		
J1:5/1 (Manston Road WB 1 (Entry))	3.25	0.00	Y	Arm J1:6 Ahead	Inf	94.9 %	1930	1930
				Arm J1:9 Left	15.00	5.1 %		
J1:5/2 (Manston Road WB 1 (Entry))	3.50	0.00	Y	Arm J1:6 Ahead	Inf	100.0 %	1965	1965
J1:6/1 (Manston Road WB 3 (Entry))	3.25	0.00	Y	Arm J1:10 Ahead	Inf	100.0 %	1940	1940
J1:6/2 (Manston Road WB 3 (Entry))	3.50	0.00	Y	Arm J1:8 Right	Inf	2.3 %	1965	1965
				Arm J1:10 Ahead	Inf	97.7 %		
J1:7/1 (Manston Road WB 1 (Exit) Lane 1)	Infinite Saturation Flow						Inf	Inf
J1:8/1 (Northern Access Road (Exit) Lane 1)	Infinite Saturation Flow						Inf	Inf
J1:9/1 (Southern Access Road (Exit) Lane 1)	Infinite Saturation Flow						Inf	Inf
J1:10/1 (Manston Road EB 1 (Exit) Lane 1)	Infinite Saturation Flow						Inf	Inf
J1:11/1 (Manston Road EB 3 (Entry))	3.50	0.00	Y	Arm J1:4 Ahead	Inf	100.0 %	1965	1965

Full Input Data And Results

Junction: J2: Jct 13_B2050_Manston Ct Rd								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J2:1/1 (Manston Court Road Entry)	3.11	0.00	Y	Arm J2:4 Right	15.00	91.4 %	1751	1751
				Arm J2:6 Left	15.00	8.6 %		
J2:2/1 (Manston Court Road Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
J2:3/1 (Manston Road west arm entry)	3.00	0.00	Y	Arm J2:2 Left	12.00	19.0 %	1871	1871
				Arm J2:6 Ahead	Inf	81.0 %		
J2:4/1 (Manston Road west arm exit Lane 1)	Infinite Saturation Flow						Inf	Inf
J2:5/1 (Manston Road east arm entry)	2.50	0.00	Y	Arm J2:2 Right	15.00	3.1 %	1859	1859
				Arm J2:4 Ahead	Inf	96.9 %		
J2:6/1 (Manston Road east arm exit Lane 1)	Infinite Saturation Flow						Inf	Inf

Scenario 1: '2039 + Dev Traffic PM' (FG5: '2039 + Dev Traffic PM', Plan 1: '2039 Growthed Traffic Airport Peak')

Stage Sequence Diagram

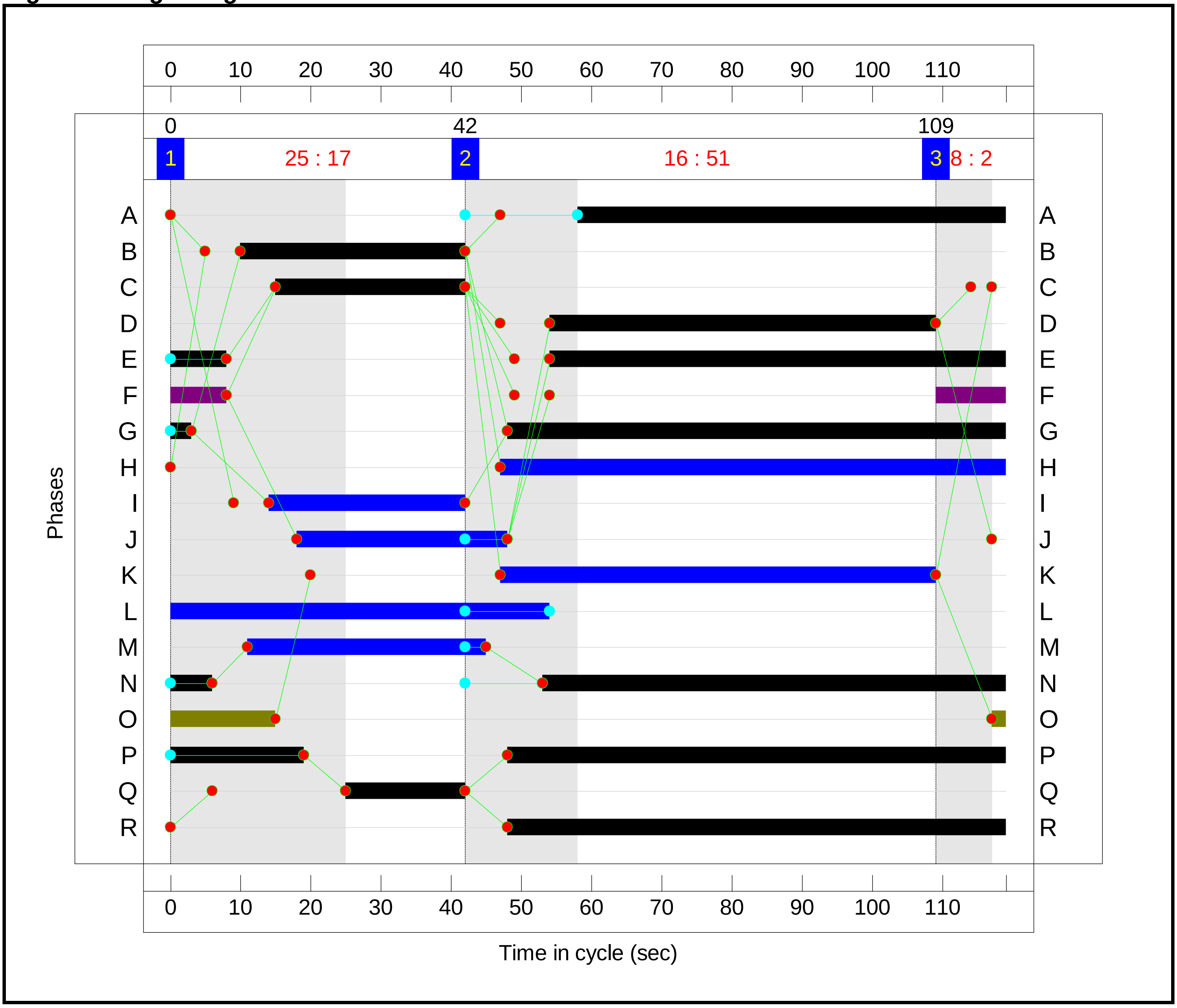


Stage Timings

Stage	1	2	3
Duration	17	51	2
Change Point	0	42	109

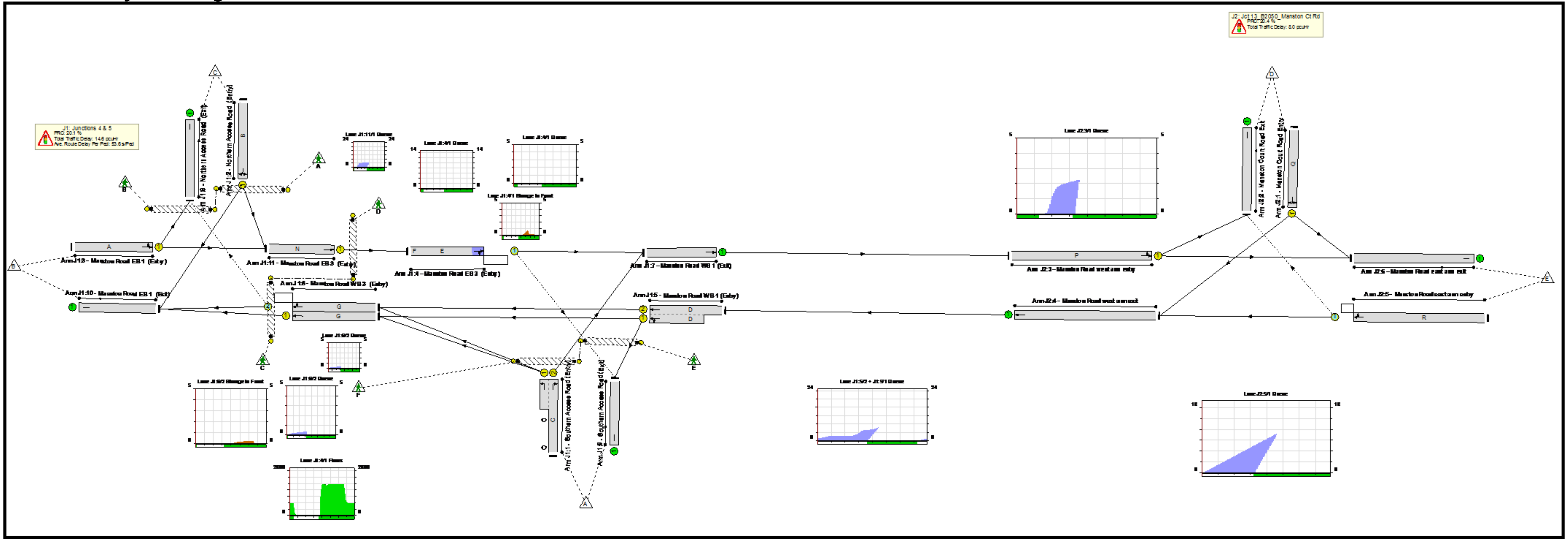
Full Input Data And Results

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 4+5 Staggered	-	-	**N/A**	-	-		-	-	-	-	-	-	**74.9%**
J1: Junctions 4 && 5	-	-	**N/A**	-	-		-	-	-	-	-	-	**74.9%**
1/2+1/1	Southern Access Road (Entry) Left Right	U	N/A	N/A	C	O	1	27:44	17	130	1965:1965	313+294	21.4 : 21.4%
2/1	Northern Access Road (Entry) Right Left	U	N/A	N/A	B		1	32	-	194	1828	507	38.3%
3/1	Manston Road EB 1 (Entry) Left Ahead	U	N/A	N/A	A		1	61	-	767	1965	1024	74.9%
4/1	Manston Road EB 3 (Entry) Ahead Right	O	N/A	N/A	E	F	1	73	18	877	1956	1216	72.1%
5/2+5/1	Manston Road WB 1 (Entry) Ahead Left	U	N/A	N/A	D		1	55	-	742	1965:1930	502+626	65.8 : 65.8%
6/1	Manston Road WB 3 (Entry) Ahead	U	N/A	N/A	G		1	74	-	435	1940	1223	35.6%
6/2	Manston Road WB 3 (Entry) Right Ahead	O	N/A	N/A	G		1	74	-	349	1965	1238	28.2%
7/1	Manston Road WB 1 (Exit) Ahead	U	N/A	N/A	-		-	-	-	891	Inf	Inf	0.0%
8/1	Northern Access Road (Exit)	U	N/A	N/A	-		-	-	-	23	Inf	Inf	0.0%
9/1	Southern Access Road (Exit)	U	N/A	N/A	-		-	-	-	74	Inf	Inf	0.0%
10/1	Manston Road EB 1 (Exit)	U	N/A	N/A	-		-	-	-	845	Inf	Inf	0.0%
11/1	Manston Road EB 3 (Entry) Ahead	U	N/A	N/A	N		1	72	-	877	1965	1205	72.8%

Full Input Data And Results

Ped Link: P1	Unnamed Ped Link	-	N/A	-	L		1	54	-	2	-	32672	0.0%
Ped Link: P2	Unnamed Ped Link	-	N/A	-	H		1	72	-	2	-	43563	0.0%
Ped Link: P3	Unnamed Ped Link	-	N/A	-	I		1	28	-	2	-	16941	0.0%
Ped Link: P4	Unnamed Ped Link	-	N/A	-	J		1	30	-	2	-	18151	0.0%
Ped Link: P5	Unnamed Ped Link	-	N/A	-	K		1	62	-	2	-	37513	0.0%
Ped Link: P6	Unnamed Ped Link	-	N/A	-	M		1	34	-	2	-	20571	0.0%
J2: Jct 13_B2050_Manston Ct Rd	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**74.8%**
1/1	Manston Court Road Entry Right Left	U	N/A	N/A	Q		1	17	-	198	1751	265	74.8%
2/1	Manston Court Road Exit	U	N/A	N/A	-		-	-	-	187	Inf	Inf	0.0%
3/1	Manston Road west arm entry Left Ahead	U	N/A	N/A	P		1	90	-	891	1871	1431	62.3%
4/1	Manston Road west arm exit Ahead	U	N/A	N/A	-		-	-	-	742	Inf	Inf	0.0%
5/1	Manston Road east arm entry Right Ahead	O	N/A	N/A	R		1	71	-	579	1859	1125	51.5%
6/1	Manston Road east arm exit	U	N/A	N/A	-		-	-	-	739	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: Junctions 4+5 Staggered	**-**	**-**	**71**	**7**	**1**	**16.8**	**5.7**	**0.1**	**22.6**	**-**	**-**	**-**	**-**
J1: Junctions 4 && 5	**-**	**-**	**53**	**7**	**1**	**11.6**	**2.9**	**0.1**	**14.6**	**-**	**-**	**-**	**-**
1/2+1/1	130	130	-	-	-	1.1	0.1	-	1.2	33.9	1.7	0.1	1.9
2/1	194	194	-	-	-	1.9	0.3	-	2.2	40.5	5.2	0.3	5.5
3/1	767	767	-	-	-	4.8	1.5	-	6.2	29.3	19.8	1.5	21.3
4/1	877	877	45	7	1	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0
5/2+5/1	742	742	-	-	-	2.4	1.0	-	3.3	16.2	6.2	1.0	7.2
6/1	435	435	-	-	-	0.2	0.0	-	0.2	1.6	0.8	0.0	0.8
6/2	349	349	8	0	0	0.1	0.0	0.0	0.1	1.3	0.3	0.0	0.3
7/1	891	891	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	23	23	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/1	74	74	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
10/1	845	845	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
11/1	877	877	-	-	-	1.2	0.0	-	1.2	5.1	4.5	0.0	4.5
Ped Link: P1	2	2	-	-	-	-	-	-	0.0	9.1	-	-	0.0
Ped Link: P2	2	2	-	-	-	-	-	-	0.0	16.2	-	-	0.0
Ped Link: P3	2	2	-	-	-	-	-	-	0.0	47.1	-	-	0.1
Ped Link: P4	2	2	-	-	-	-	-	-	0.0	50.1	-	-	0.1
Ped Link: P5	2	2	-	-	-	-	-	-	0.0	16.3	-	-	0.0
Ped Link: P6	2	2	-	-	-	-	-	-	0.0	21.9	-	-	0.0
J2: Jct 13_B2050_Manston Ct Rd	**-**	**-**	**18**	**0**	**0**	**5.2**	**2.8**	**0.1**	**8.0**	**-**	**-**	**-**	**-**
1/1	198	198	-	-	-	2.7	1.4	-	4.1	74.2	6.2	1.4	7.6
2/1	187	187	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
3/1	891	891	-	-	-	0.4	0.8	-	1.2	4.8	2.2	0.8	3.1
4/1	742	742	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

Full Input Data And Results

5/1	579	579	18	0	0	2.2	0.5	0.1	2.8	17.1	10.9	0.5	11.5
6/1	739	739	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

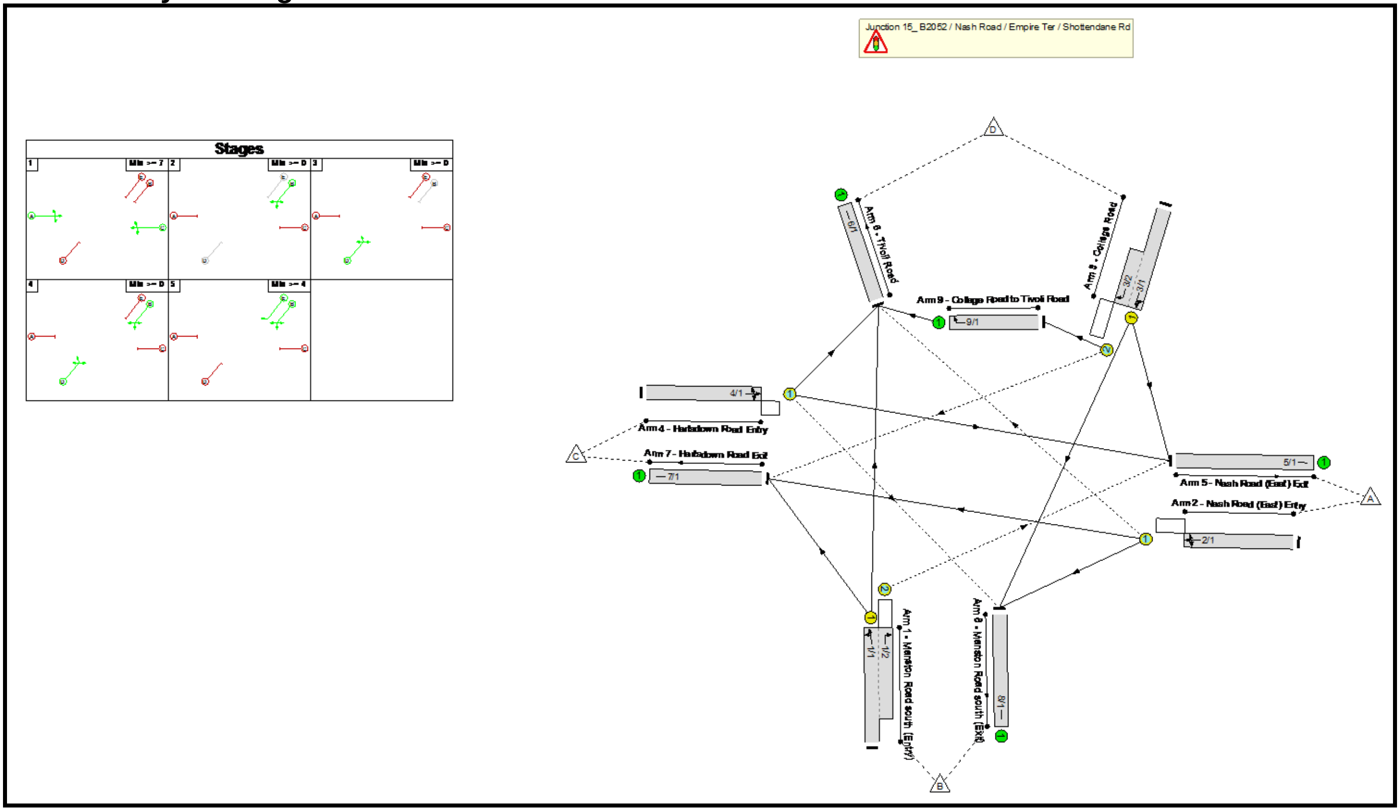
C1	PRC for Signalled Lanes (%):	20.1	Total Delay for Signalled Lanes (pcuHr):	22.62	Cycle Time (s):	119
	PRC Over All Lanes (%):	20.1	Total Delay Over All Lanes(pcuHr):	22.62		

Full Input Data And Results

User and Project Details

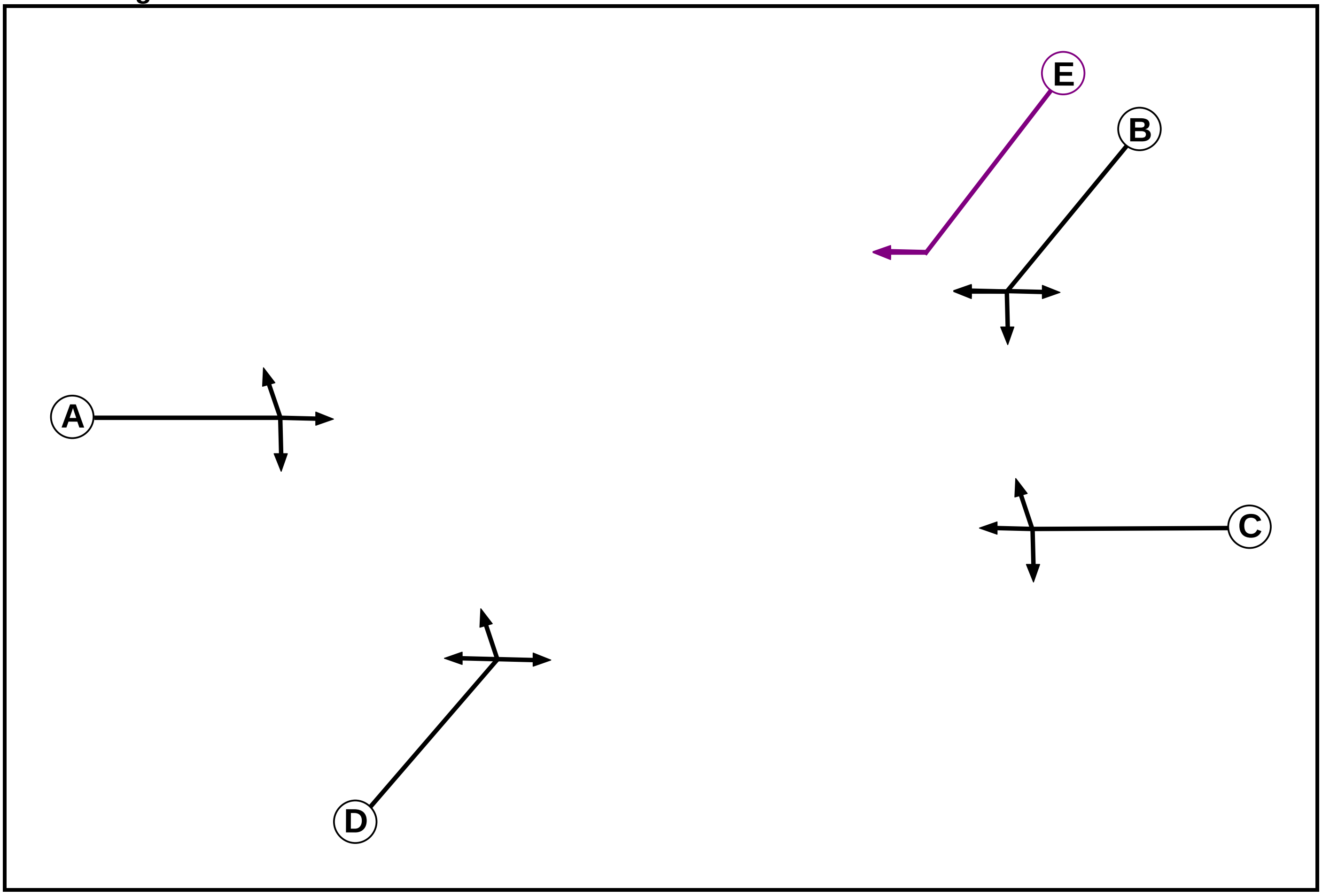
Project:	**Manston Airport DCO EIA**
Title:	**Junction 15**
Location:	
File name:	Junction 15_Mitigation - PM.lsg3x
Author:	FOUDA
Company:	Wood
Address:	LEAMINGTON SPA- GABLES HOUSE, KENILWORTH-ROAD,WARWICKSHIRE CV32 6JX
Notes:	

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	Ind. Arrow	B	4	4

Full Input Data And Results

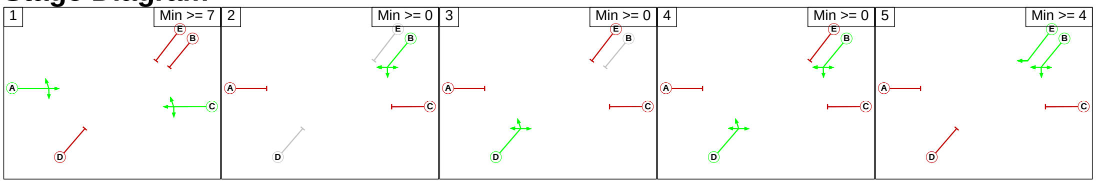
Phase Intergreens Matrix

		Starting Phase				
		A	B	C	D	E
Terminating Phase	A		10	-	10	10
	B	10		10	-	-
	C	-	10		10	-
	D	5	-	5		8
	E	10	-	-	-	

Phases in Stage

Stage No.	Phases in Stage
1	A C
2	B
3	D
4	B D
5	B E

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	5
From Stage	1		10	10	10	10
	2	10		2	2	0
	3	5	2		2	8
	4	10	0	0		8
	5	10	0	2	2	

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)**
1/2 (Manston Road south (Entry))	5/1 (Right)	1439	0	3/1	1.09	All	3.00	-	0.50	3	3.00
2/1 (Nash Road (East) Entry)	6/1 (Right)	1439	0	4/1	1.09	To 5/1 (Ahead) To 6/1 (Left)	3.00	3.00	0.50	3	3.00
3/2 (College Road)	7/1 (Right)	1439	0	1/1	1.09	All	4.00	4.00	0.50	4	3.00
4/1 (Hartsdown Road Entry)	8/1 (Right)	1439	0	2/1	1.09	To 7/1 (Ahead) To 8/1 (Left)	2.00	2.00	0.50	2	2.00

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	D	2	3	60.0	Geom	-	2.45	0.00	Y	Arm 6 Ahead Arm 7 Left	Inf 19.00
1/2 (Manston Road south (Entry))	O	D	2	3	12.0	Geom	-	2.25	0.00	Y	Arm 5 Right	12.00
2/1 (Nash Road (East) Entry)	O	C	2	3	60.0	Geom	-	3.50	0.00	Y	Arm 6 Right Arm 7 Ahead Arm 8 Left	15.00 Inf 15.00
3/1 (College Road)	U	B	2	3	60.0	Geom	-	3.10	0.00	Y	Arm 5 Left Arm 8 Ahead	10.00 Inf
3/2 (College Road)	O	B E	2	3	6.0	Geom	-	3.10	0.00	Y	Arm 7 Right Arm 9 Right	16.00 15.00
4/1 (Hartsdown Road Entry)	O	A	2	3	60.0	Geom	-	3.00	0.00	Y	Arm 5 Ahead Arm 6 Left Arm 8 Right	Inf 10.00 8.00
5/1 (Nash Road (East) Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
6/1 (Tivoli Road)	U		2	3	60.0	Inf	-	-	-	-	-	-
7/1 (Hartsdown Road Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
8/1 (Manston Road south (Exit))	U		2	3	60.0	Inf	-	-	-	-	-	-
9/1 (College Road to Tivoli Road)	U		2	3	60.0	Geom	-	3.25	0.00	Y	Arm 6 Right	15.00

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2039 + Dev Traffic - AM Peak'	07:45	08:45	01:00	
2: '2039 + Dev Traffic - PM Peak'	16:45	17:45	01:00	

Scenario 1: '2039 + Dev Traffic - PM Peak' (FG2: '2039 + Dev Traffic - PM Peak', Plan 3: 'PM Peak Development Traffic Mitigation Early Cut-Off')

Traffic Flows, Desired

Desired Flow :

	Destination					
Origin		A	B	C	D	Tot.
	A	0	121	317	72	510
	B	111	0	60	527	698
	C	210	28	0	182	420
	D	19	327	449	89	884
	Tot.	340	476	826	870	2512

Traffic Lane Flows

Lane	Scenario 1: 2039 + Dev Traffic - PM Peak
Junction: Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	
1/1 (with short)	698(In) 587(Out)
1/2 (short)	111
2/1	510
3/1 (with short)	884(In) 346(Out)
3/2 (short)	538
4/1	420
5/1	340
6/1	870
7/1	826
8/1	476
9/1	89

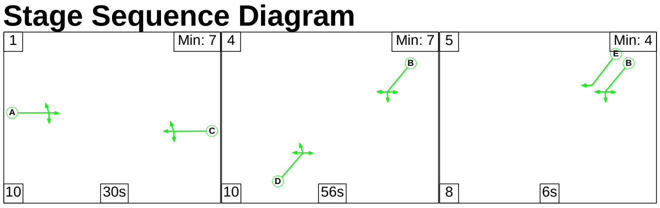
Full Input Data And Results

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))	2.45	0.00	Y	Arm 6 Ahead	Inf	89.8 %	1845	1845
				Arm 7 Left	19.00	10.2 %		
1/2 (Manston Road south (Entry))	2.25	0.00	Y	Arm 5 Right	12.00	100.0 %	1636	1636
2/1 (Nash Road (East) Entry)	3.50	0.00	Y	Arm 6 Right	15.00	14.1 %	1893	1893
				Arm 7 Ahead	Inf	62.2 %		
				Arm 8 Left	15.00	23.7 %		
3/1 (College Road)	3.10	0.00	Y	Arm 5 Left	10.00	5.5 %	1909	1909
				Arm 8 Ahead	Inf	94.5 %		
3/2 (College Road)	3.10	0.00	Y	Arm 7 Right	16.00	83.5 %	1758	1758
				Arm 9 Right	15.00	16.5 %		
4/1 (Hartsdown Road Entry)	3.00	0.00	Y	Arm 5 Ahead	Inf	50.0 %	1777	1777
				Arm 6 Left	10.00	43.3 %		
				Arm 8 Right	8.00	6.7 %		
5/1 (Nash Road (East) Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Tivoli Road Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (Hartsdown Road Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (Manston Road south (Exit) Lane 1)	Infinite Saturation Flow						Inf	Inf
9/1 (College Road to Tivoli Road)	3.25	0.00	Y	Arm 6 Right	15.00	100.0 %	1764	1764

Scenario 1: '2039 + Dev Traffic - PM Peak' (FG2: '2039 + Dev Traffic - PM Peak', Plan 3: 'PM Peak Development Traffic Mitigation Early Cut-Off')

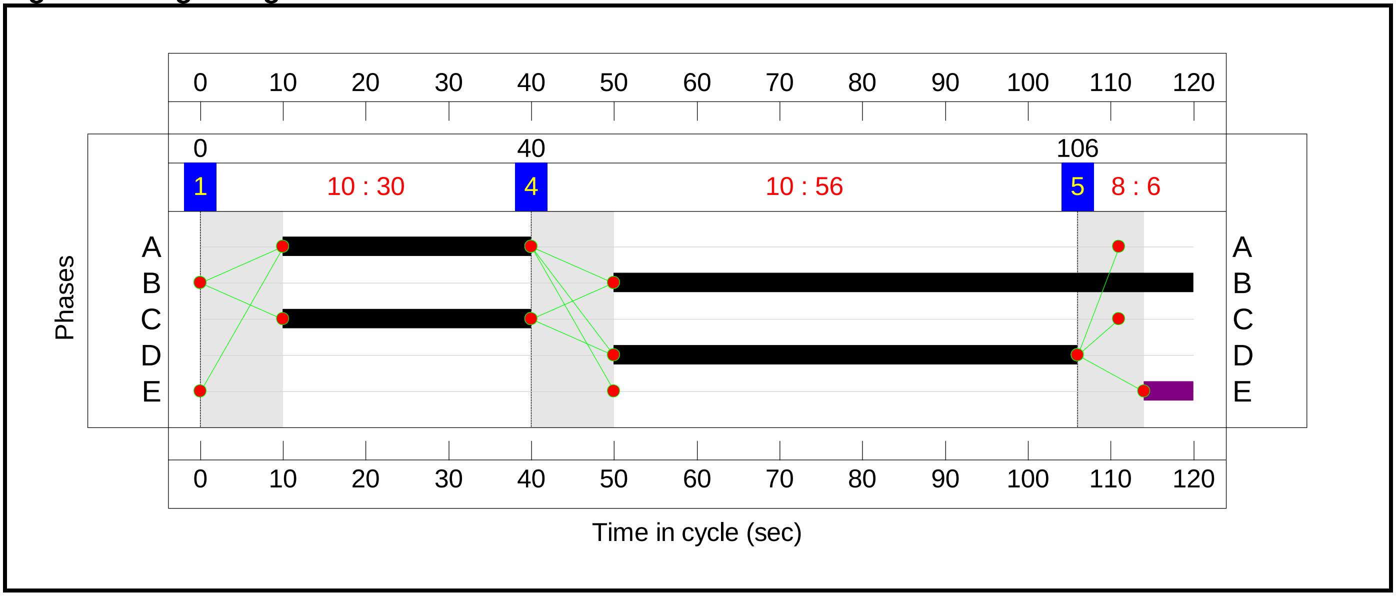
Stage Sequence Diagram



Stage Timings

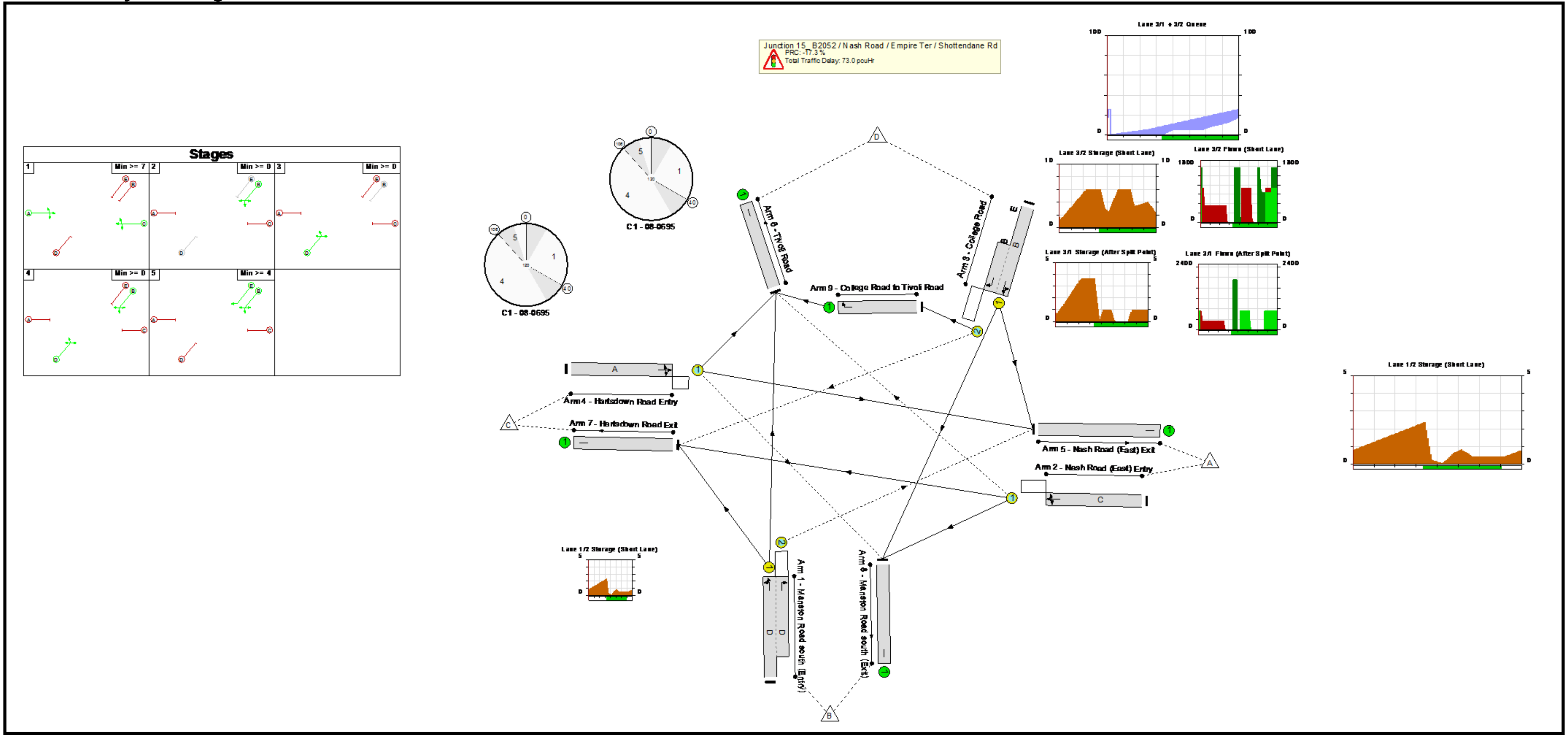
Stage	**1**	**4**	**5**
Duration	30	56	6
Change Point	0	40	106

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**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**105.6%**
Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**105.6%**
1/1+1/2	Manston Road south (Entry) Right Ahead Left	U+O	N/A	N/A	D		1	56	-	698	1845:1636	791+150	74.2 : 74.2%
2/1	Nash Road (East) Entry Right Ahead Left	O	N/A	N/A	C		1	30	-	510	1893	483	105.6%
3/1+3/2	College Road Left Right Ahead Right2	U+O	N/A	N/A	B	E	1	70	6	884	1909:1758	338+526	102.3 : 102.3%
4/1	Hartsdown Road Entry Ahead Left Right	O	N/A	N/A	A		1	30	-	420	1777	459	91.5%
5/1	Nash Road (East) Exit	U	N/A	N/A	-		-	-	-	340	Inf	Inf	0.0%
6/1	Tivoli Road	U	N/A	N/A	-		-	-	-	870	Inf	Inf	0.0%
7/1	Hartsdown Road Exit	U	N/A	N/A	-		-	-	-	826	Inf	Inf	0.0%
8/1	Manston Road south (Exit)	U	N/A	N/A	-		-	-	-	476	Inf	Inf	0.0%
9/1	College Road to Tivoli Road Right	U	N/A	N/A	-		-	-	-	89	1764	1764	4.9%

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	**-**	**-**	**312**	**176**	**159**	**24.4**	**46.4**	**2.2**	**73.0**	**-**	**-**	**-**	**-**
Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	**-**	**-**	**312**	**176**	**159**	**24.4**	**46.4**	**2.2**	**73.0**	**-**	**-**	**-**	**-**
1/1+1/2	698	698	111	0	0	4.5	1.4	0.1	6.1	31.4	15.8	1.4	17.2
2/1	510	486	27	0	41	7.7	19.9	0.3	27.9	197.0	17.8	19.9	37.7
3/1+3/2	884	864	173	176	90	7.1	20.6	1.7	29.4	119.9	26.1	20.6	46.7
4/1	420	420	0	0	28	5.0	4.4	0.1	9.6	82.0	13.5	4.4	17.9
5/1	340	340	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	865	865	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	801	801	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	463	463	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/1	87	87	-	-	-	0.0	0.0	-	0.0	1.1	0.0	0.0	0.0

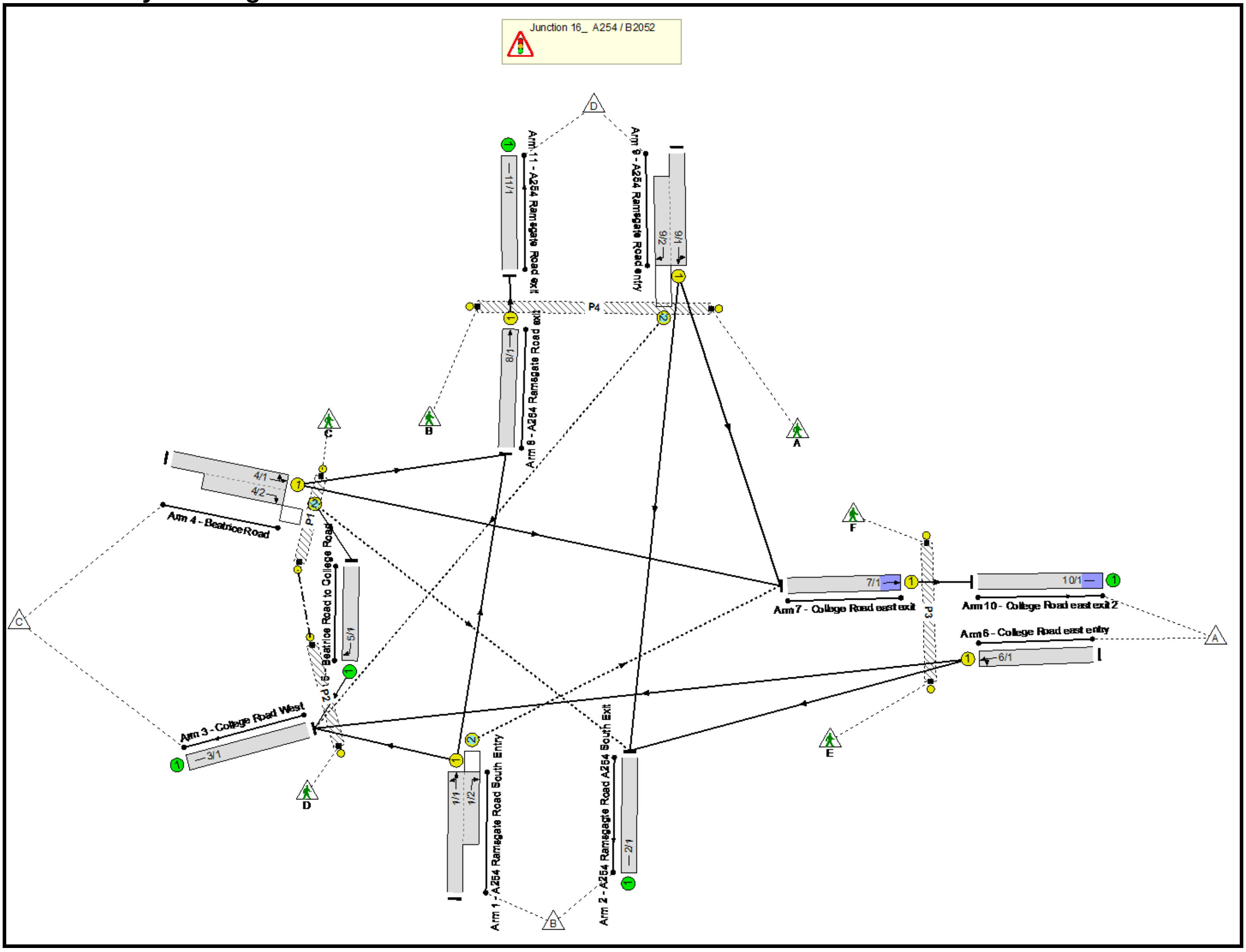
C1 - 08-0695 PRC for Signalled Lanes (%): -17.3 Total Delay for Signalled Lanes (pcuHr): 73.01 Cycle Time (s): 120
PRC Over All Lanes (%): -17.3 Total Delay Over All Lanes(pcuHr): 73.04

Full Input Data And Results

User and Project Details

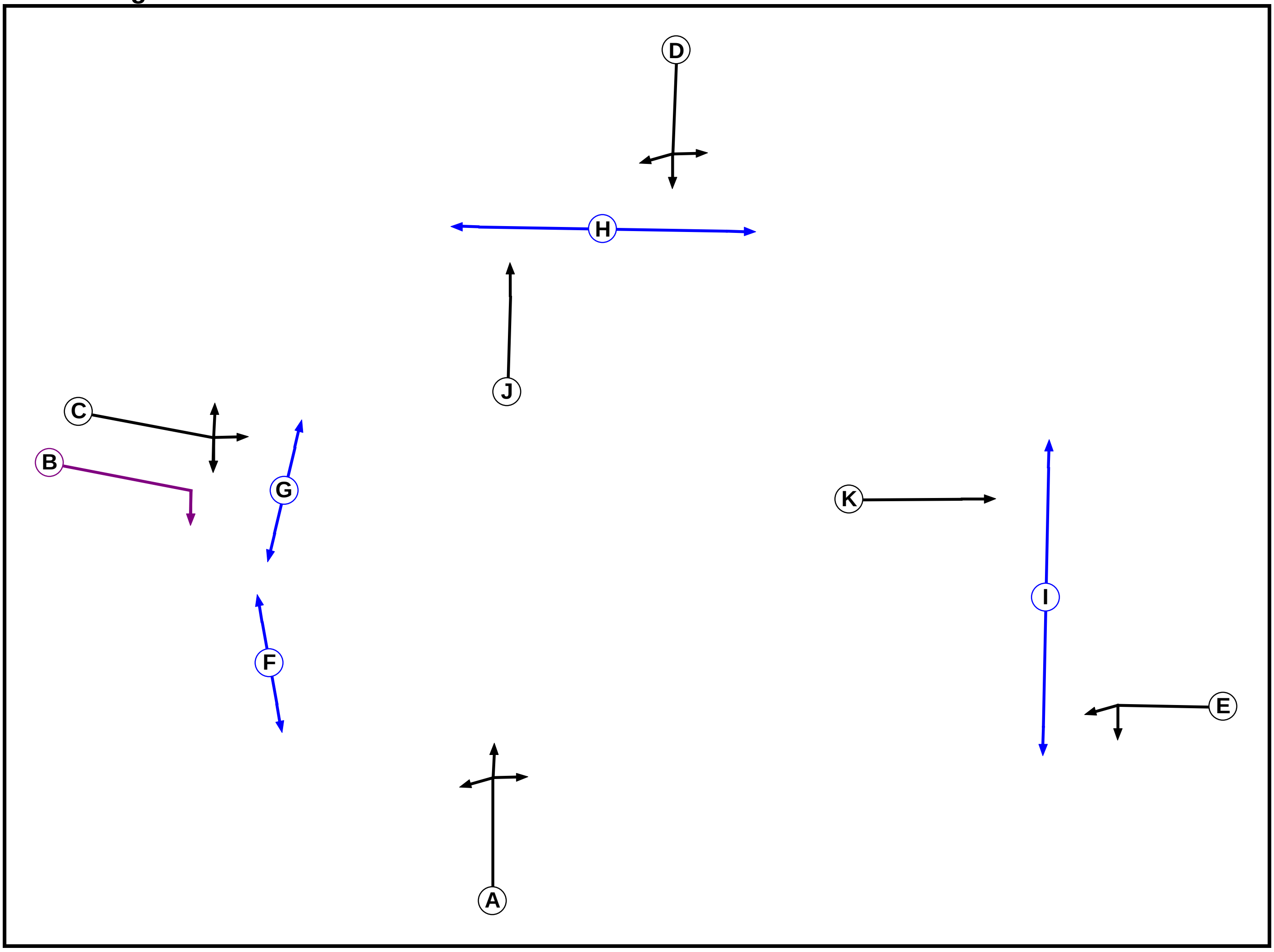
Project:	**Manston Airport DCO EIA**
Title:	**Junction 16**
Location:	
File name:	Junction 16_Mitigation_R3_2019 - PM.lsg3x
Author:	FOUDA
Company:	Wood
Address:	LEAMINGTON SPA- GABLES HOUSE, KENILWORTH-ROAD,WARWICKSHIRE CV32 6JX
Notes:	

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	Ind. Arrow	C	4	4
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
J	Traffic		7	7
K	Traffic		7	2

Full Input Data And Results

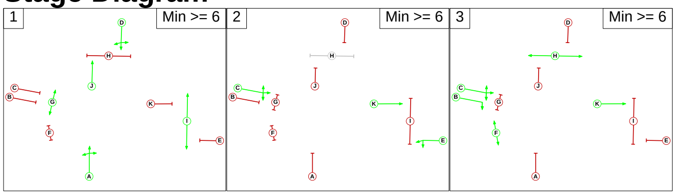
Phase Intergreens Matrix

		Starting Phase										
		A	B	C	D	E	F	G	H	I	J	K
Terminating Phase	A		6	6	-	6	6	-	-	-	-	-
	B	5		-	5	5	-	6	-	-	-	-
	C	5	-		5	-	-	6	-	-	-	-
	D	-	6	6		6	10	-	6	-	-	-
	E	7	6	-	5		10	-	-	6	-	-
	F	7	-	-	7	7		-	-	-	-	-
	G	-	8	8	-	-	-		-	-	-	-
	H	-	-	-	9	-	-	-		-	9	-
	I	-	-	-	-	7	-	-	-		-	7
	J	-	-	-	-	-	-	-	6	-		-
	K	-	-	-	-	-	-	-	-	6	-	

Phases in Stage

Stage No.	Phases in Stage
1	A D G I J
2	C E K
3	B C F H K

Stage Diagram



Phase Delays

Term. Stage	Start Stage	Phase	Type	Value	Cont value
1	2	C	Gaining absolute	7	7
1	2	J	Losing	4	4
2	1	K	Losing	5	5
3	1	K	Losing	5	5

Prohibited Stage Change

		To Stage		
		1	2	3
From Stage	1		8	10
	2	11		10
	3	11	7	

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	2.00	-	0.50	2	2.00
4/2 (Beatrice Road)	2/1 (Right)	1439	0	6/1	1.09	All	2.00	2.00	0.50	2	2.00
9/2 (A254 Ramsgate Road entry)	3/1 (Right)	1439	0	1/1	1.09	All	4.00	-	0.50	4	3.00

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 Arm 8 Ahead	8.00 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 Arm 8 Left	Inf 15.00
4/2 (Beatrice Road)	O	C B	2	3	8.0	Geom	-	3.00	0.00	Y	Arm 2 Right Arm 5 Right	15.00 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 Arm 3 Ahead	Inf Inf
7/1 (College Road east exit)	U	K	2	3	60.0	Geom	-	3.50	0.00	Y	Arm 10 Ahead	Inf
8/1 (A254 Ramsgate Road exit)	U	J	2	3	60.0	Geom	-	3.50	0.00	Y	Arm 11 Ahead	Inf
9/1 (A254 Ramsgate Road entry)	U	D	2	3	60.0	Geom	-	3.00	0.00	Y	Arm 2 Ahead Arm 7 Left	Inf 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
10/1 (College Road east exit 2)	U		2	3	60.0	Geom	-	3.50	0.00	Y		

11/1 (A254 Ramsgate Road exit)	U		2	3	60.0	Inf	-	-	-	-	-	-

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2039 + Dev Traffic - AM Peak'	07:45	08:45	01:00	
2: '2039 + Dev Traffic - PM Peak'	16:45	17:45	01:00	
3: 'AM 2039 + Dev Revised'	08:00	09:00	01:00	
4: 'PM 2039 + Dev Revised'	17:00	18:00	01:00	

Scenario 1: 'PM 2039 + Dev Revised' (FG4: 'PM 2039 + Dev Revised', Plan 3: '2039 + Dev Traffic - PM Peak Mitigation')

Traffic Flows, Desired

Desired Flow :

	Destination					
Origin		A	B	C	D	Tot.
	A	0	155	351	0	506
	B	98	0	351	413	862
	C	409	280	93	18	800
	D	9	476	92	0	577
	Tot.	516	911	887	431	2745

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 1: PM 2039 + Dev Revised
Junction: Junction 16_ A254 / B2052	
1/1 (with short)	862(In) 764(Out)
1/2 (short)	98
2/1	911
3/1	887
4/1 (with short)	800(In) 427(Out)
4/2 (short)	373
5/1	93
6/1	506
7/1	516
8/1	431
9/1 (with short)	577(In) 485(Out)
9/2 (short)	92
10/1	516
11/1	431

Full Input Data And Results

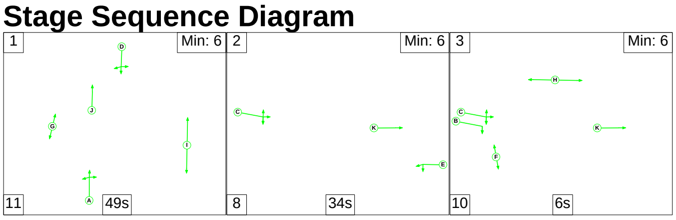
Lane Saturation Flows

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	45.9 %	1717	1717
				Arm 8 Ahead	Inf	54.1 %		
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	95.8 %	1907	1907
				Arm 8 Left	15.00	4.2 %		
4/2 (Beatrice Road)	3.00	0.00	Y	Arm 2 Right	15.00	75.1 %	1707	1707
				Arm 5 Right	8.00	24.9 %		
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	30.6 %	1980	1980
				Arm 3 Ahead	Inf	69.4 %		
7/1 (College Road east exit)	3.50	0.00	Y	Arm 10 Ahead	Inf	100.0 %	1965	1965
8/1 (A254 Ramsgate Road exit)	3.50	0.00	Y	Arm 11 Ahead	Inf	100.0 %	1965	1965
9/1 (A254 Ramsgate Road entry)	3.00	0.00	Y	Arm 2 Ahead	Inf	98.1 %	1908	1908
				Arm 7 Left	8.00	1.9 %		
9/2 (A254 Ramsgate Road entry)	3.00	0.00	Y	Arm 3 Right	15.00	100.0 %	1741	1741
10/1 (College Road east exit 2)	3.50	0.00	Y				1965	1965
11/1 (A254 Ramsgate Road exit Lane 1)	Infinite Saturation Flow						Inf	Inf

Scenario 1: 'PM 2039 + Dev Revised' (FG4: 'PM 2039 + Dev Revised', Plan 3: '2039 + Dev Traffic - PM Peak Mitigation')

Stage Sequence Diagram

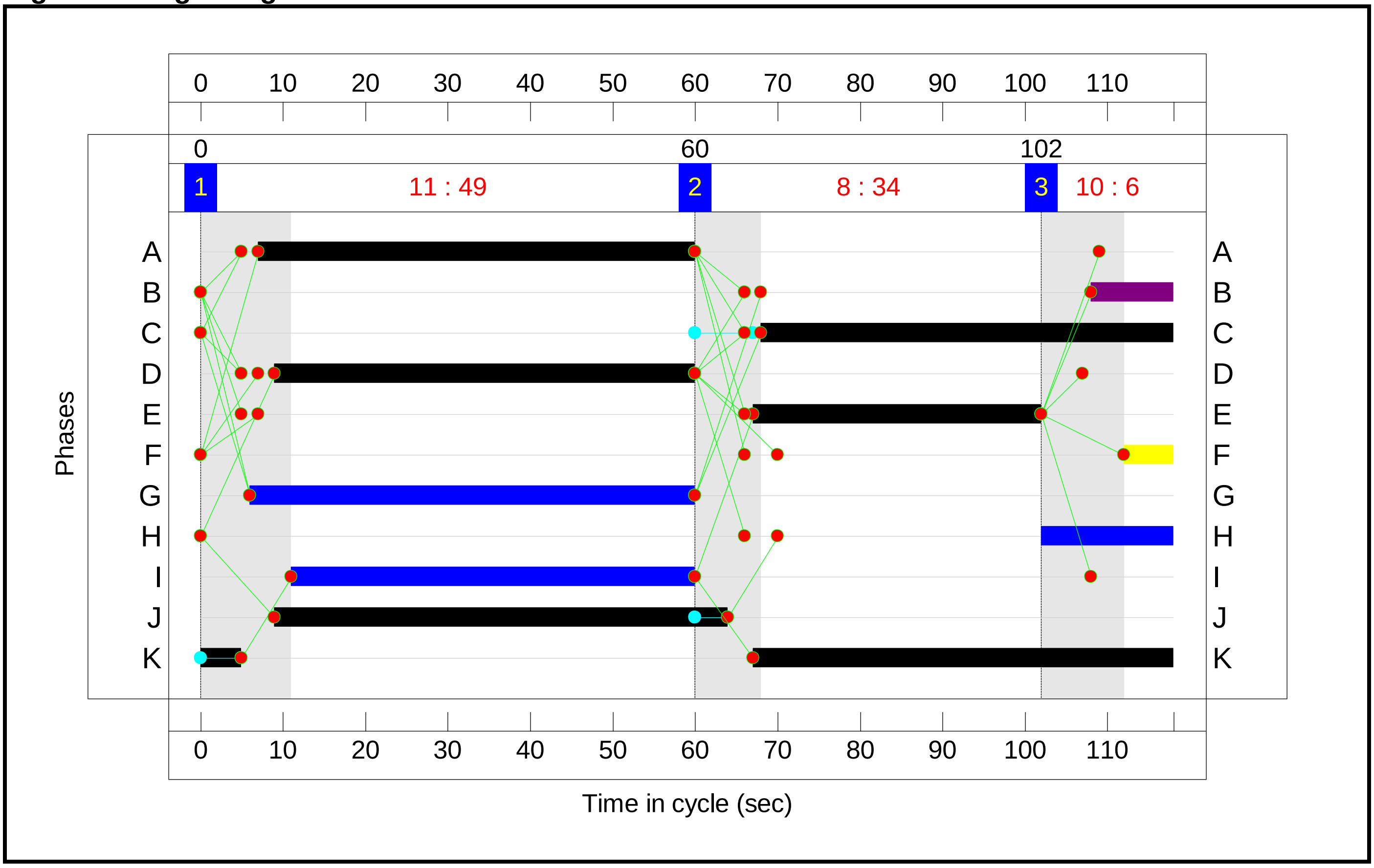


Full Input Data And Results

Stage Timings

Stage	1	2	3
Duration	49	34	6
Change Point	0	60	102

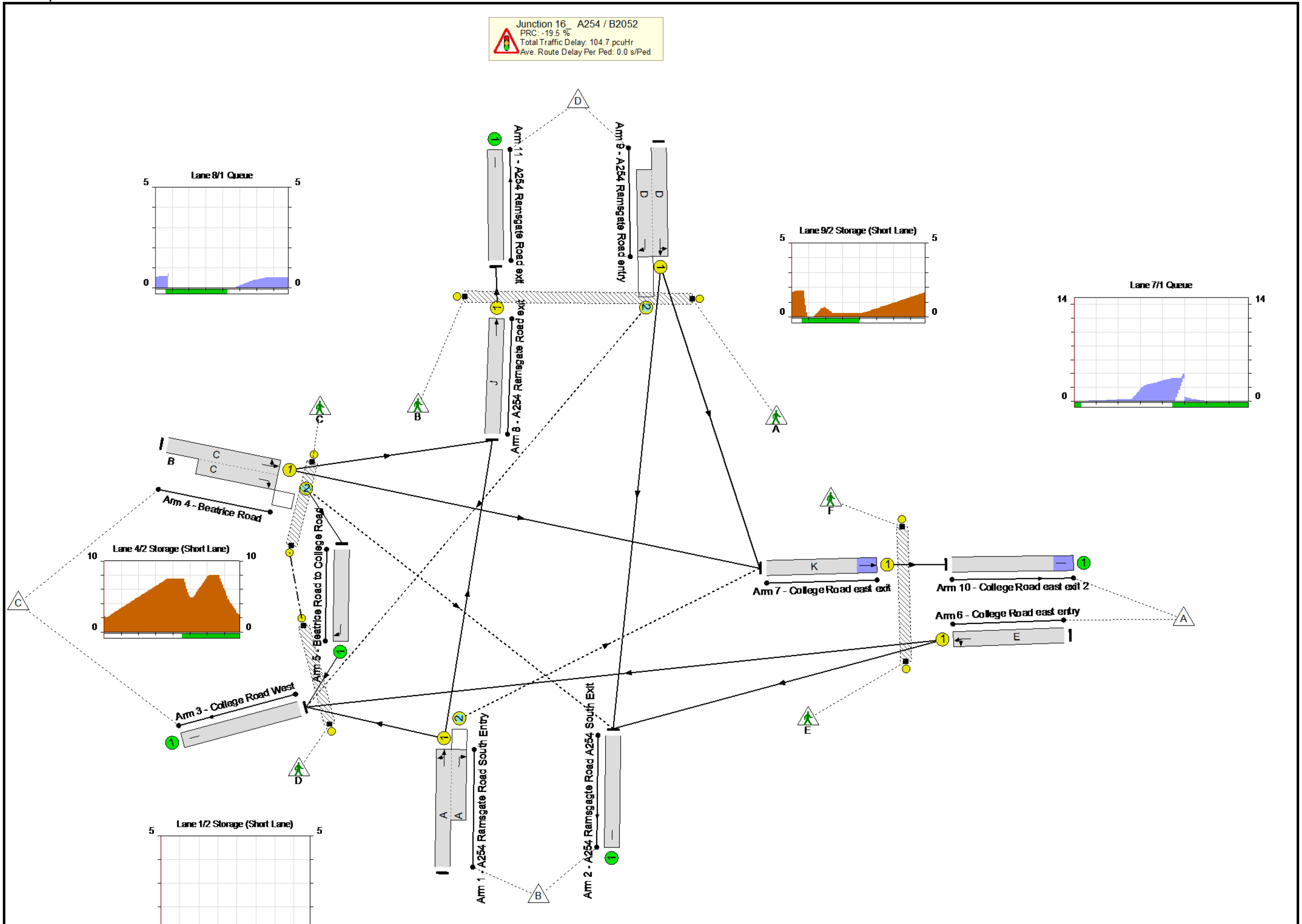
Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram

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 16	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**107.6%**
Junction 16_ A254 / B2052	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**107.6%**
1/1+1/2	A254 Ramsgate Road South Entry Left Right Ahead	U+O	N/A	N/A	A		1	53	-	862	1717:1622	713+91	107.1 : 107.1%
2/1	A254 Ramsgagte Road A254 South Exit	U	N/A	N/A	-		-	-	-	911	Inf	Inf	0.0%
3/1	College Road West	U	N/A	N/A	-		-	-	-	887	Inf	Inf	0.0%
4/1+4/2	Beatrice Road Right Right2 Ahead Left	U+O	N/A	N/A	C	B	1	50	10	800	1907:1707	397+347	107.6 : 107.6%
5/1	Beatrice Road to College Road Right	U	N/A	N/A	-		-	-	-	93	2115	2115	4.1%
6/1	College Road east entry Left Ahead	U	N/A	N/A	E		1	35	-	506	1980	604	83.8%
7/1	College Road east exit Ahead	U	N/A	N/A	K		1	56	-	516	1965	949	50.6%
8/1	A254 Ramsgate Road exit Ahead	U	N/A	N/A	J		1	55	-	431	1965	933	43.1%
9/1+9/2	A254 Ramsgate Road entry Ahead Right Left	U+O	N/A	N/A	D		1	51	-	577	1908:1741	743+93	65.3 : 98.9%
10/1	College Road east exit 2	U	N/A	N/A	-		-	-	-	516	1965	1965	24.5%
11/1	A254 Ramsgate Road exit	U	N/A	N/A	-		-	-	-	431	Inf	Inf	0.0%
Ped Link: P1	Unnamed Ped Link	-	N/A	-	G		1	54	-	0	-	32949	0.0%
Ped Link: P2	Unnamed Ped Link	-	N/A	-	F		1	6	-	0	-	3661	0.0%
Ped Link: P3	Unnamed Ped Link	-	N/A	-	I		1	49	-	0	-	29898	0.0%
Ped Link: P4	Unnamed Ped Link	-	N/A	-	H		1	16	-	0	-	9763	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	**-**	**-**	**151**	**190**	**103**	**30.4**	**72.6**	**1.8**	**104.7**	**-**	**-**	**-**	**-**
Junction 16_ A254 / B2052	**-**	**-**	**151**	**190**	**103**	**30.4**	**72.6**	**1.8**	**104.7**	**-**	**-**	**-**	**-**
1/1+1/2	862	805	91	0	0	10.7	34.8	0.3	45.8	191.3	31.2	34.8	66.0
2/1	891	891	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
3/1	857	857	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/1+4/2	800	744	58	190	12	9.4	34.0	0.6	44.0	197.8	20.4	34.0	54.4
5/1	86	86	-	-	-	0.0	0.0	-	0.0	0.9	0.0	0.0	0.0
6/1	506	506	-	-	-	5.4	2.5	-	7.8	55.8	15.5	2.5	17.9
7/1	481	481	-	-	-	0.8	0.0	-	0.8	5.8	4.0	0.0	4.0
8/1	402	402	-	-	-	0.2	0.0	-	0.2	1.9	0.7	0.0	0.7
9/1+9/2	577	577	1	0	91	3.9	1.1	1.0	6.0	37.3	12.7	1.1	13.8
10/1	481	481	-	-	-	0.0	0.2	-	0.2	1.2	0.0	0.2	0.2
11/1	402	402	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
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 (%): -19.5
PRC Over All Lanes (%): -19.5
Total Delay for Signalled Lanes (pcuHr): 104.57
Total Delay Over All Lanes(pcuHr): 104.75
Cycle Time (s): 118

Junctions 9

ARCADY 9 - Roundabout Module

Filename: Jct 17_R1_val_mit_R1 - PM.j9
Path: R:\Projects\38199 Manston Airport DCO EIA\4 Design\Transport\MAY 2019 - Jucntion Moddeling - URGENT\Mitigation Schemes Models to Use\Junction 17
Report generation date: 14/06/2019 11:33:54

»Arcady Module - 2039 + Dev Traffic, PM
»Lane Simulation-mit - 2039 + Dev Traffic, PM

Summary of junction performance

	PM						
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)	Junction LOS	Network Residual Capacity
	Arcady Module - 2039 + Dev Traffic						
1 - Poorhole Ln	2.5	0.34	0.72	C	2.37	F	-18 % [2 - Margate Rd]
2 - Margate Rd	68.7	4.30	1.15	F			
3 - Star Ln	14.4	1.51	0.98	F			
4 - Ramsgate Rd	53.9	2.09	1.06	F			
	Lane Simulation-mit [Lane Simulation] - 2039 + Dev Traffic						
1 - Poorhole Ln	11.9	1.53		F	2.59	F	% [ ]
2 - Margate Rd	66.9	4.17		F			
3 - Star Ln	18.6	1.71		F			
4 - Ramsgate Rd	61.2	2.24		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.

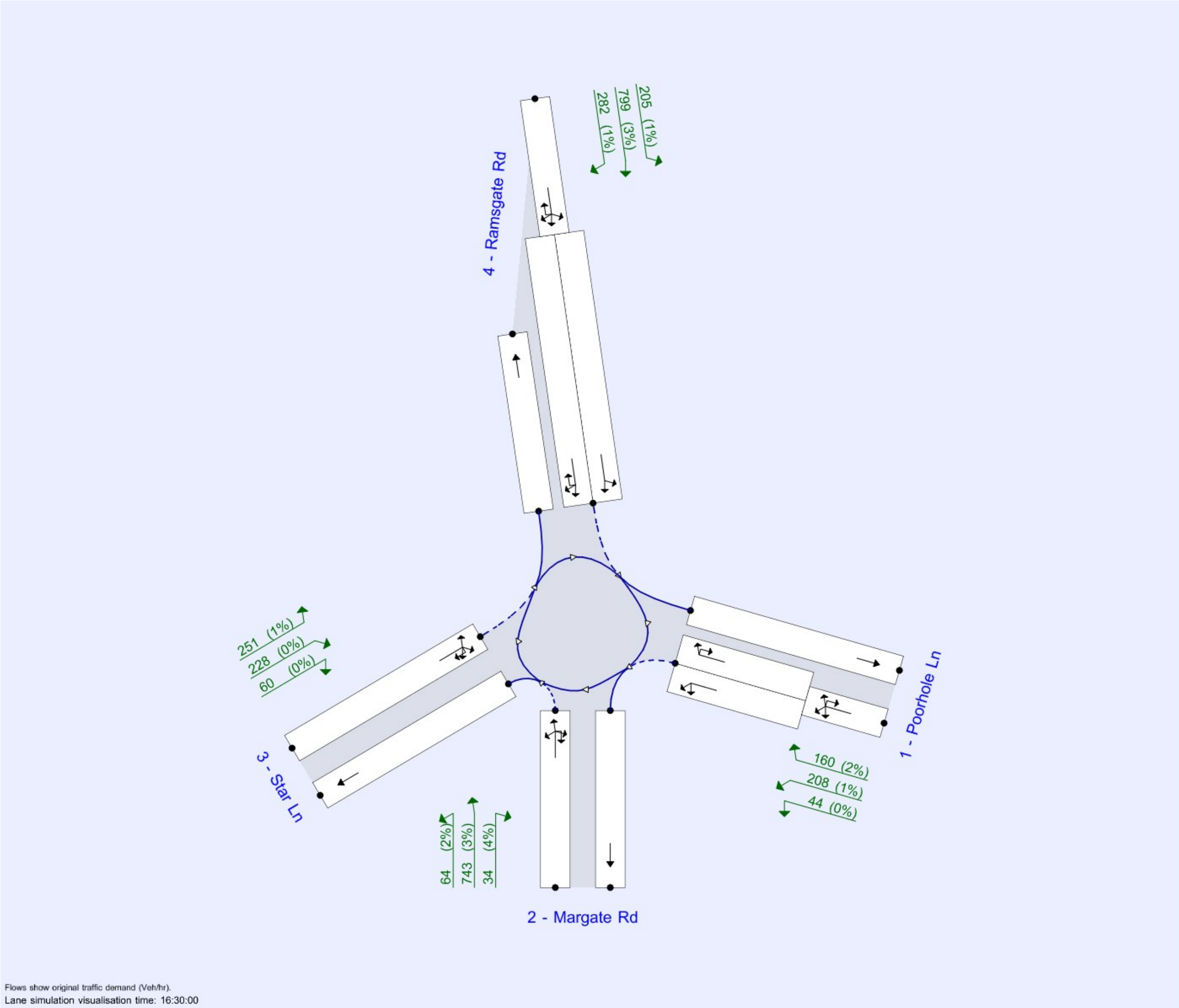
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	04/10/2017
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	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
D10	2039 + Dev Traffic	PM	ONE HOUR	16:30	18:00	15	✓

Arcady Module - 2039 + Dev Traffic, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Description	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	Arcady Module	Poorhole Ln - Margate Rd - Star Ln - Ramsgate Rd	✓	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	2.37	F

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-18	2 - Margate Rd

Arms

Arms

Arm	Name	Description
1	Poorhole Ln	
2	Margate Rd	
3	Star Ln	
4	Ramsgate Rd	

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 - Poorhole Ln	3.73	6.84	20.0	13.3	40.1	41.0	
2 - Margate Rd	3.65	4.39	3.0	6.9	40.1	50.0	
3 - Star Ln	3.91	4.50	2.7	12.0	40.1	22.0	
4 - Ramsgate Rd	3.22	7.79	9.9	18.7	40.1	64.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - Poorhole Ln	0.613	1649
2 - Margate Rd	0.459	1031
3 - Star Ln	0.557	1284
4 - Ramsgate Rd	0.535	1349

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

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
1 - Poorhole Ln	Percentage		70.00
2 - Margate Rd	Percentage		117.00
3 - Star Ln	Percentage		80.00
4 - Ramsgate Rd	Percentage		117.00

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 - Poorhole Ln		ONE HOUR	✓	412	100.000
2 - Margate Rd		ONE HOUR	✓	841	100.000
3 - Star Ln		ONE HOUR	✓	539	100.000
4 - Ramsgate Rd		ONE HOUR	✓	1286	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - Poorhole Ln	2 - Margate Rd	3 - Star Ln	4 - Ramsgate Rd
From	1 - Poorhole Ln	0	44	208	160
	2 - Margate Rd	34	0	64	743
	3 - Star Ln	228	60	0	251
	4 - Ramsgate Rd	205	799	282	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - Poorhole Ln	2 - Margate Rd	3 - Star Ln	4 - Ramsgate Rd
From	1 - Poorhole Ln	0	0	1	2
	2 - Margate Rd	4	0	2	3
	3 - Star Ln	0	0	0	1
	4 - Ramsgate Rd	1	3	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 - Poorhole Ln	0.72	0.34	2.5	C	378	567
2 - Margate Rd	1.15	4.30	68.7	F	772	1158
3 - Star Ln	0.98	1.51	14.4	F	495	742
4 - Ramsgate Rd	1.06	2.09	53.9	F	1180	1770

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 - Poorhole Ln	310	78	851	771	0.402	308	348	0.0	0.7	0.129	A
2 - Margate Rd	633	158	485	915	0.692	625	673	0.0	2.1	0.201	B
3 - Star Ln	406	101	696	704	0.576	401	413	0.0	1.3	0.194	B
4 - Ramsgate Rd	968	242	239	1396	0.693	959	858	0.0	2.2	0.135	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 - Poorhole Ln	370	93	1016	700	0.529	369	415	0.7	1.1	0.180	B
2 - Margate Rd	756	189	580	865	0.874	742	804	2.1	5.6	0.444	D
3 - Star Ln	485	121	829	644	0.752	479	494	1.3	2.8	0.351	C
4 - Ramsgate Rd	1156	289	286	1368	0.845	1145	1022	2.2	4.9	0.258	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 - Poorhole Ln	454	113	1163	636	0.714	449	479	1.1	2.3	0.313	C
2 - Margate Rd	926	231	688	808	1.146	797	924	5.6	37.9	1.882	F
3 - Star Ln	593	148	911	607	0.978	562	574	2.8	10.5	0.972	F
4 - Ramsgate Rd	1416	354	333	1339	1.058	1310	1140	4.9	31.5	1.026	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 - Poorhole Ln	454	113	1179	629	0.721	453	488	2.3	2.5	0.339	C
2 - Margate Rd	926	231	696	804	1.151	802	937	37.9	68.7	4.134	F
3 - Star Ln	593	148	917	604	0.983	578	581	10.5	14.4	1.513	F
4 - Ramsgate Rd	1416	354	341	1334	1.062	1326	1154	31.5	53.9	2.085	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 - Poorhole Ln	370	93	1175	630	0.587	374	467	2.5	1.5	0.238	B
2 - Margate Rd	756	189	626	841	0.899	829	924	68.7	50.5	4.304	F
3 - Star Ln	485	121	911	606	0.799	524	543	14.4	4.7	0.873	F
4 - Ramsgate Rd	1156	289	313	1351	0.856	1329	1122	53.9	10.7	1.571	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 - Poorhole Ln	310	78	888	755	0.411	313	369	1.5	0.7	0.137	A
2 - Margate Rd	633	158	499	908	0.697	825	702	50.5	2.6	1.470	F
3 - Star Ln	406	101	884	619	0.656	416	441	4.7	2.0	0.310	C
4 - Ramsgate Rd	968	242	256	1386	0.699	1001	1044	10.7	2.4	0.169	B

Lane Simulation-mit - 2039 + Dev Traffic, 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.
Last Run	Lane Simulation	2 - Margate Rd - Lane Simulation	Arm 2: Queue at end of modelled period is greater than 10 PCU. Delay is likely to have been underestimated.

Analysis Set Details

ID	Name	Use Lane Simulation	Description	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A2	Lane Simulation-mit	✓	Poorhole Ln - Margate Rd - Star Ln - Ramsgate Rd	✓	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	2.59	F

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	Poorhole Ln	
2	Margate Rd	
3	Star Ln	
4	Ramsgate Rd	

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 - Poorhole Ln	3.73	6.84	20.0	13.3	40.1	41.0	
2 - Margate Rd	3.65	4.39	3.0	6.9	40.1	50.0	
3 - Star Ln	3.91	4.50	2.7	12.0	40.1	22.0	
4 - Ramsgate Rd	3.22	7.79	9.9	18.7	40.1	64.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - Poorhole Ln	0.613	1649
2 - Margate Rd	0.459	1031
3 - Star Ln	0.557	1284
4 - Ramsgate Rd	0.535	1349

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

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
1 - Poorhole Ln	Percentage		70.00
2 - Margate Rd	Percentage		117.00
3 - Star Ln	Percentage		80.00
4 - Ramsgate Rd	Percentage		117.00

Lane Simulation: Arm options

Arm	Lane capacity source	Traffic considering secondary lanes (%)
1 - Poorhole Ln	Evenly split	10.00
2 - Margate Rd	Evenly split	10.00
3 - Star Ln	Evenly split	10.00
4 - Ramsgate 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 - Poorhole Ln	Entry	1	1	2, 3	✓	4.00		0	99999	
			2	1, 4	✓	4.00		0	99999	
		2	1	(1, 2, 3, 4)		Infinity				
	Exit	1	1			Infinity				
2 - Margate Rd	Entry	1	1	1, 2, 3, 4		Infinity		0	99999	
	Exit	1	1			Infinity				
3 - Star Ln	Entry	1	1	1, 2, 3, 4		Infinity		0	99999	
	Exit	1	1			Infinity				
4 - Ramsgate Rd	Entry	1	1	1, 2	✓	8.00		0	99999	
			2	2, 3, 4	✓	8.00		0	99999	
		2	1	(1, 2, 3, 4)		Infinity				
	Exit	1	1			Infinity				

Entry Lane slope and intercept

Arm	Side	Lane level	Lane	Final slope	Final intercept (PCU/hr)
1 - Poorhole Ln	Entry	1	1	0.306	825
			2	0.306	825
2 - Margate Rd	Entry	1	1	0.459	1031
3 - Star Ln	Entry	1	1	0.557	1284
4 - Ramsgate Rd	Entry	1	1	0.267	674
			2	0.267	674

Summary of Entry Lane allowed movements

Arm	Lane Level	Lane	Destination arm			
			Poorhole Ln	Margate Rd	Star Ln	Ramsgate Rd
1 - Poorhole Ln	1	1		✓	✓	
		2	✓			✓
	2	1	✓	✓	✓	✓
2 - Margate Rd	1	1	✓	✓	✓	✓
3 - Star Ln	1	1	✓	✓	✓	✓
4 - Ramsgate 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
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 - Poorhole Ln		ONE HOUR	✓	412	100.000
2 - Margate Rd		ONE HOUR	✓	841	100.000
3 - Star Ln		ONE HOUR	✓	539	100.000
4 - Ramsgate Rd		ONE HOUR	✓	1286	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - Poorhole Ln	2 - Margate Rd	3 - Star Ln	4 - Ramsgate Rd
From	1 - Poorhole Ln	0	44	208	160
	2 - Margate Rd	34	0	64	743
	3 - Star Ln	228	60	0	251
	4 - Ramsgate Rd	205	799	282	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - Poorhole Ln	2 - Margate Rd	3 - Star Ln	4 - Ramsgate Rd
From	1 - Poorhole Ln	0	0	1	2
	2 - Margate Rd	4	0	2	3
	3 - Star Ln	0	0	0	1
	4 - Ramsgate Rd	1	3	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 - Poorhole Ln	1.53	11.9	F	379	568
2 - Margate Rd	4.17	66.9	F	774	1161
3 - Star Ln	1.71	18.6	F	494	740
4 - Ramsgate Rd	2.24	61.2	F	1181	1771

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 - Poorhole Ln	315	79	866	316	313	350	0.0	1.6	0.285	C
2 - Margate Rd	630	157	494	631	645	687	0.0	2.2	0.211	B
3 - Star Ln	400	100	703	405	402	423	0.0	1.3	0.200	B
4 - Ramsgate Rd	972	243	243	973	978	864	0.0	3.3	0.191	B

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 - Poorhole Ln	369	92	1028	366	367	417	1.6	2.9	0.421	D
2 - Margate Rd	757	189	578	751	757	815	2.2	6.5	0.430	D
3 - Star Ln	483	121	832	480	479	497	1.3	2.9	0.315	C
4 - Ramsgate Rd	1174	293	283	1161	1166	1029	3.3	7.9	0.336	C

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 - Poorhole Ln	455	114	1178	431	433	481	2.9	9.9	0.989	F
2 - Margate Rd	934	234	673	810	834	935	6.5	36.3	1.640	F
3 - Star Ln	599	150	918	559	553	566	2.9	13.9	1.007	F
4 - Ramsgate Rd	1405	351	332	1326	1331	1144	7.9	34.7	1.064	F

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 - Poorhole Ln	450	113	1178	448	452	484	9.9	11.9	1.526	F
2 - Margate Rd	933	233	688	817	833	938	36.3	66.8	3.916	F
3 - Star Ln	598	149	928	572	576	577	13.9	18.6	1.709	F
4 - Ramsgate Rd	1422	356	340	1322	1344	1160	34.7	61.2	2.238	F

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 - Poorhole Ln	372	93	1112	385	402	453	11.9	4.9	1.033	F
2 - Margate Rd	757	189	620	835	853	877	66.8	48.1	4.167	F
3 - Star Ln	481	120	921	512	534	534	18.6	6.3	1.204	F
4 - Ramsgate Rd	1144	286	309	1257	1319	1125	61.2	27.0	1.982	F

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 - Poorhole Ln	309	77	882	315	331	361	4.9	1.6	0.402	C
2 - Margate Rd	632	158	502	738	807	695	48.1	10.5	1.863	F
3 - Star Ln	401	100	802	407	428	438	6.3	1.6	0.377	C
4 - Ramsgate Rd	971	243	245	998	1086	963	27.0	4.3	0.549	D

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 - Poorhole Ln	Entry	1	1	2, 3	193	384	0.503	194	190	0.0	1.0	0.293	C
			2	1, 4	121	379	0.320	122	123	0.0	0.4	0.227	B
		2	1	(1, 2, 3, 4)	315			314	319	0.0	0.2	0.018	A
	Exit	1	1		350			350	346	0.0	0.0	0.000	A
2 - Margate Rd	Entry	1	1	1, 2, 3, 4	630	911	0.692	631	645	0.0	2.2	0.211	B
	Exit	1	1		687			687	693	0.0	0.0	0.000	A
3 - Star Ln	Entry	1	1	1, 2, 3, 4	400	701	0.571	405	402	0.0	1.3	0.200	B
	Exit	1	1		423			423	417	0.0	0.0	0.000	A
4 - Ramsgate Rd	Entry	1	1	1, 2	475	697	0.682	477	480	0.0	1.5	0.184	B
			2	2, 3, 4	495	698	0.710	496	498	0.0	1.7	0.194	B
		2	1	(1, 2, 3, 4)	972			971	991	0.0	0.1	0.002	A
	Exit	1	1		864			864	883	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 - Poorhole Ln	Entry	1	1	2, 3	226	349	0.649	224	224	1.0	1.6	0.379	C
			2	1, 4	142	345	0.413	142	143	0.4	0.7	0.288	C
		2	1	(1, 2, 3, 4)	369			369	370	0.2	0.6	0.076	A
	Exit	1	1		417			417	414	0.0	0.0	0.000	A
2 - Margate Rd	Entry	1	1	1, 2, 3, 4	757	866	0.875	751	757	2.2	6.5	0.430	D
	Exit	1	1		815			815	823	0.0	0.0	0.000	A
3 - Star Ln	Entry	1	1	1, 2, 3, 4	483	642	0.752	480	479	1.3	2.9	0.315	C
	Exit	1	1		497			497	495	0.0	0.0	0.000	A
4 - Ramsgate Rd	Entry	1	1	1, 2	583	685	0.851	580	576	1.5	3.2	0.295	C
			2	2, 3, 4	585	686	0.854	581	590	1.7	3.5	0.308	C
		2	1	(1, 2, 3, 4)	1174			1168	1180	0.1	1.1	0.034	A
	Exit	1	1		1029			1029	1036	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 - Poorhole Ln	Entry	1	1	2, 3	264	316	0.837	260	263	1.6	2.8	0.555	D
			2	1, 4	170	313	0.543	170	171	0.7	1.3	0.393	C
		2	1	(1, 2, 3, 4)	455			434	441	0.6	5.8	0.492	D
	Exit	1	1		481			481	478	0.0	0.0	0.000	A
2 - Margate Rd	Entry	1	1	1, 2, 3, 4	934	818	1.142	810	834	6.5	36.3	1.640	F
	Exit	1	1		935			935	940	0.0	0.0	0.000	A
3 - Star Ln	Entry	1	1	1, 2, 3, 4	599	604	0.991	559	553	2.9	13.9	1.007	F
	Exit	1	1		566			566	571	0.0	0.0	0.000	A
4 - Ramsgate Rd	Entry	1	1	1, 2	664	669	0.992	661	664	3.2	6.1	0.500	D
			2	2, 3, 4	669	670	0.998	665	667	3.5	6.4	0.527	D
		2	1	(1, 2, 3, 4)	1405			1333	1355	1.1	22.1	0.544	D
	Exit	1	1		1144			1144	1162	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 - Poorhole Ln	Entry	1	1	2, 3	273	317	0.861	275	277	2.8	2.7	0.620	E
			2	1, 4	174	312	0.556	173	176	1.3	1.1	0.430	D
		2	1	(1, 2, 3, 4)	450			446	451	5.8	8.0	0.977	F
	Exit	1	1		484			484	486	0.0	0.0	0.000	A
2 - Margate Rd	Entry	1	1	1, 2, 3, 4	933	808	1.155	817	833	36.3	66.8	3.916	F
	Exit	1	1		938			938	954	0.0	0.0	0.000	A
3 - Star Ln	Entry	1	1	1, 2, 3, 4	598	598	0.999	572	576	13.9	18.6	1.709	F
	Exit	1	1		577			577	582	0.0	0.0	0.000	A
4 - Ramsgate Rd	Entry	1	1	1, 2	658	666	0.987	656	669	6.1	6.4	0.574	D
			2	2, 3, 4	665	668	0.995	666	675	6.4	6.7	0.600	E
		2	1	(1, 2, 3, 4)	1422			1323	1347	22.1	48.1	1.651	F
	Exit	1	1		1160			1160	1183	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 - Poorhole Ln	Entry	1	1	2, 3	234	329	0.713	236	246	2.7	2.0	0.535	D
			2	1, 4	150	327	0.459	149	155	1.1	0.9	0.381	C
		2	1	(1, 2, 3, 4)	372			384	398	8.0	2.0	0.568	D
	Exit	1	1		453			453	467	0.0	0.0	0.000	A
2 - Margate Rd	Entry	1	1	1, 2, 3, 4	757	844	0.897	835	853	66.8	48.1	4.167	F
	Exit	1	1		877			877	927	0.0	0.0	0.000	A
3 - Star Ln	Entry	1	1	1, 2, 3, 4	481	603	0.798	512	534	18.6	6.3	1.204	F
	Exit	1	1		534			534	555	0.0	0.0	0.000	A
4 - Ramsgate Rd	Entry	1	1	1, 2	615	674	0.913	626	660	6.4	4.5	0.523	D
			2	2, 3, 4	618	677	0.913	631	659	6.7	4.8	0.558	D
		2	1	(1, 2, 3, 4)	1144			1234	1304	48.1	17.7	1.447	F
	Exit	1	1		1125			1125	1160	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 - Poorhole Ln	Entry	1	1	2, 3	192	380	0.505	194	202	2.0	0.9	0.366	C
			2	1, 4	119	377	0.317	121	129	0.9	0.5	0.270	C
		2	1	(1, 2, 3, 4)	309			311	325	2.0	0.1	0.080	A
	Exit	1	1		361			361	381	0.0	0.0	0.000	A
2 - Margate Rd	Entry	1	1	1, 2, 3, 4	632	906	0.698	738	807	48.1	10.5	1.863	F
	Exit	1	1		695			695	761	0.0	0.0	0.000	A
3 - Star Ln	Entry	1	1	1, 2, 3, 4	401	656	0.611	407	428	6.3	1.6	0.377	C
	Exit	1	1		438			438	466	0.0	0.0	0.000	A
4 - Ramsgate Rd	Entry	1	1	1, 2	486	696	0.698	490	534	4.5	1.6	0.296	C
			2	2, 3, 4	505	697	0.726	508	552	4.8	1.8	0.309	C
		2	1	(1, 2, 3, 4)	971			991	1062	17.7	0.9	0.266	C
	Exit	1	1		963			963	1043	0.0	0.0	0.000	A

Junctions 9

ARCADY 9 - Roundabout Module

Filename: Jct 20a and b_Manston Rd_A256 - PM.j9
Path: R:\Projects\38199 Manston Airport DCO EIA\4 Design\Transport\MAY 2019 - Jucntion Moddeling - URGENT\Mitigation Schemes Models to Use\Junction 20
Report generation date: 14/06/2019 11:36:20

«2039+Dev, 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				
Arm 1	7.1	0.23	0.88	B	0.26
Arm 2	5.0	0.49	0.85	D	
Arm 3	0.1	0.15	0.07	A	
Arm 4	0.4	0.05	0.29	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

2039+Dev, 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

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
D4	2039+Dev	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	✓	1745	100.000
2		ONE HOUR	✓	584	100.000
3		ONE HOUR	✓	26	100.000
4		ONE HOUR	✓	403	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	2	3	4
From	1	0	244	20	1481
	2	135	0	6	443
	3	19	7	0	0
	4	0	403	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	2	0	2
	2	1	0	0	2
	3	0	0	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	0.88	0.23	7.1	B	1601	2402
2	0.85	0.49	5.0	D	536	804
3	0.07	0.15	0.1	A	24	36
4	0.29	0.05	0.4	A	370	555

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	1314	328	308	2279	0.576	1308	115	0.0	1.3	0.062	A
2	440	110	1125	1061	0.415	437	491	0.0	0.7	0.096	A
3	20	5	1543	854	0.023	19	19	0.0	0.0	0.072	A
4	303	76	120	1585	0.191	302	1442	0.0	0.2	0.047	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	1569	392	368	2236	0.702	1565	138	1.3	2.3	0.089	A
2	525	131	1346	934	0.562	523	587	0.7	1.3	0.145	A
3	23	6	1846	673	0.035	23	23	0.0	0.0	0.092	A
4	362	91	144	1571	0.231	362	1725	0.2	0.3	0.050	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	1921	480	451	2177	0.882	1904	167	2.3	6.7	0.207	B
2	643	161	1637	767	0.838	630	717	1.3	4.4	0.407	C
3	29	7	2239	438	0.065	28	28	0.0	0.1	0.146	A
4	444	111	174	1554	0.285	443	2094	0.3	0.4	0.054	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	1921	480	451	2177	0.883	1920	169	6.7	7.1	0.230	B
2	643	161	1651	759	0.847	641	720	4.4	5.0	0.491	D
3	29	7	2264	424	0.068	29	29	0.1	0.1	0.152	A
4	444	111	177	1553	0.286	444	2116	0.4	0.4	0.054	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	1569	392	369	2236	0.702	1587	142	7.1	2.4	0.095	A
2	525	131	1365	923	0.569	539	591	5.0	1.3	0.162	A
3	23	6	1881	652	0.036	24	24	0.1	0.0	0.095	A
4	362	91	148	1569	0.231	363	1756	0.4	0.3	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	1314	328	309	2278	0.577	1318	117	2.4	1.4	0.063	A
2	440	110	1134	1056	0.416	442	493	1.3	0.7	0.098	A
3	20	5	1556	846	0.023	20	20	0.0	0.0	0.073	A
4	303	76	122	1584	0.192	304	1454	0.3	0.2	0.047	A

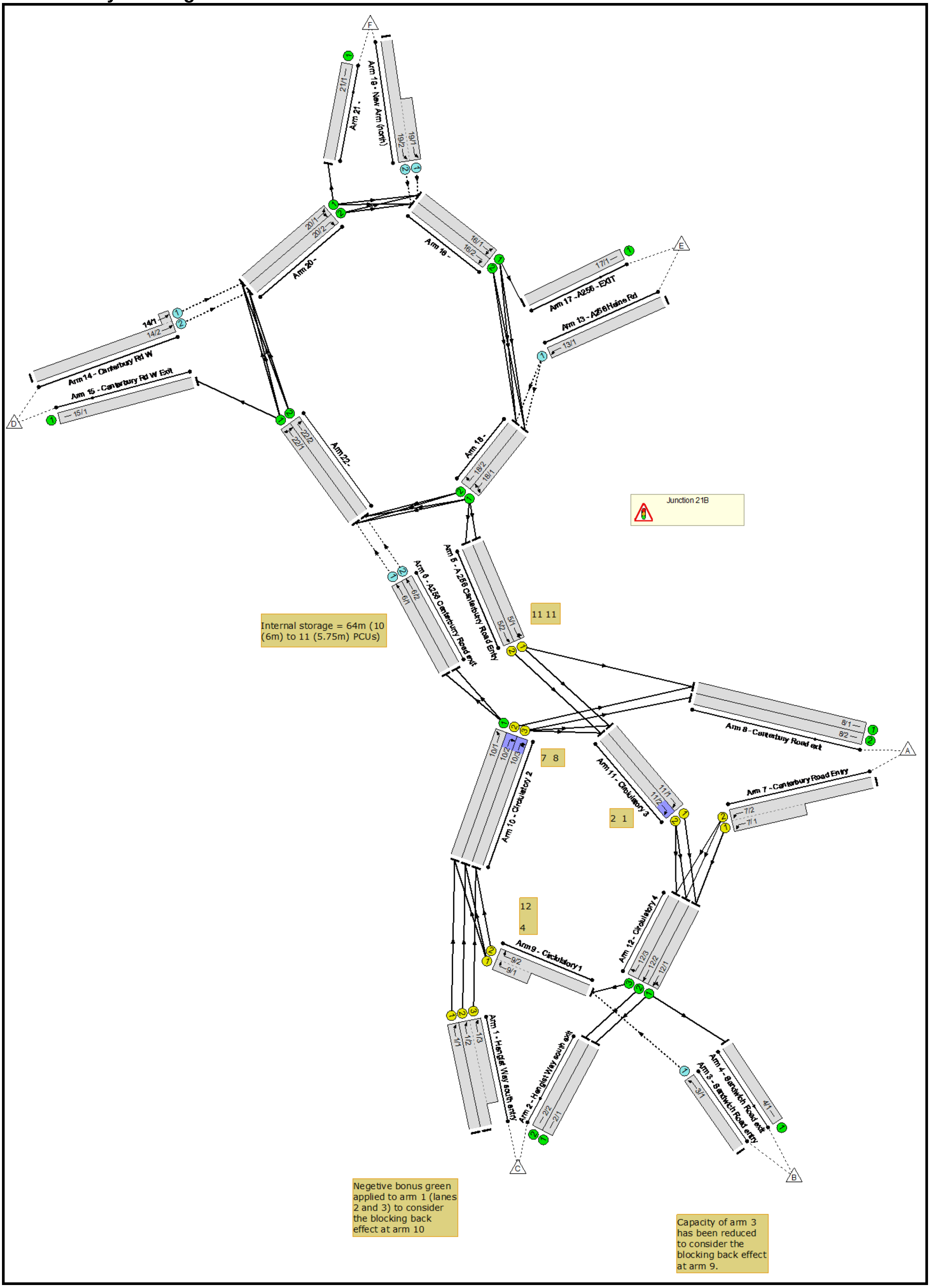
Full Input Data And Results

User and Project Details

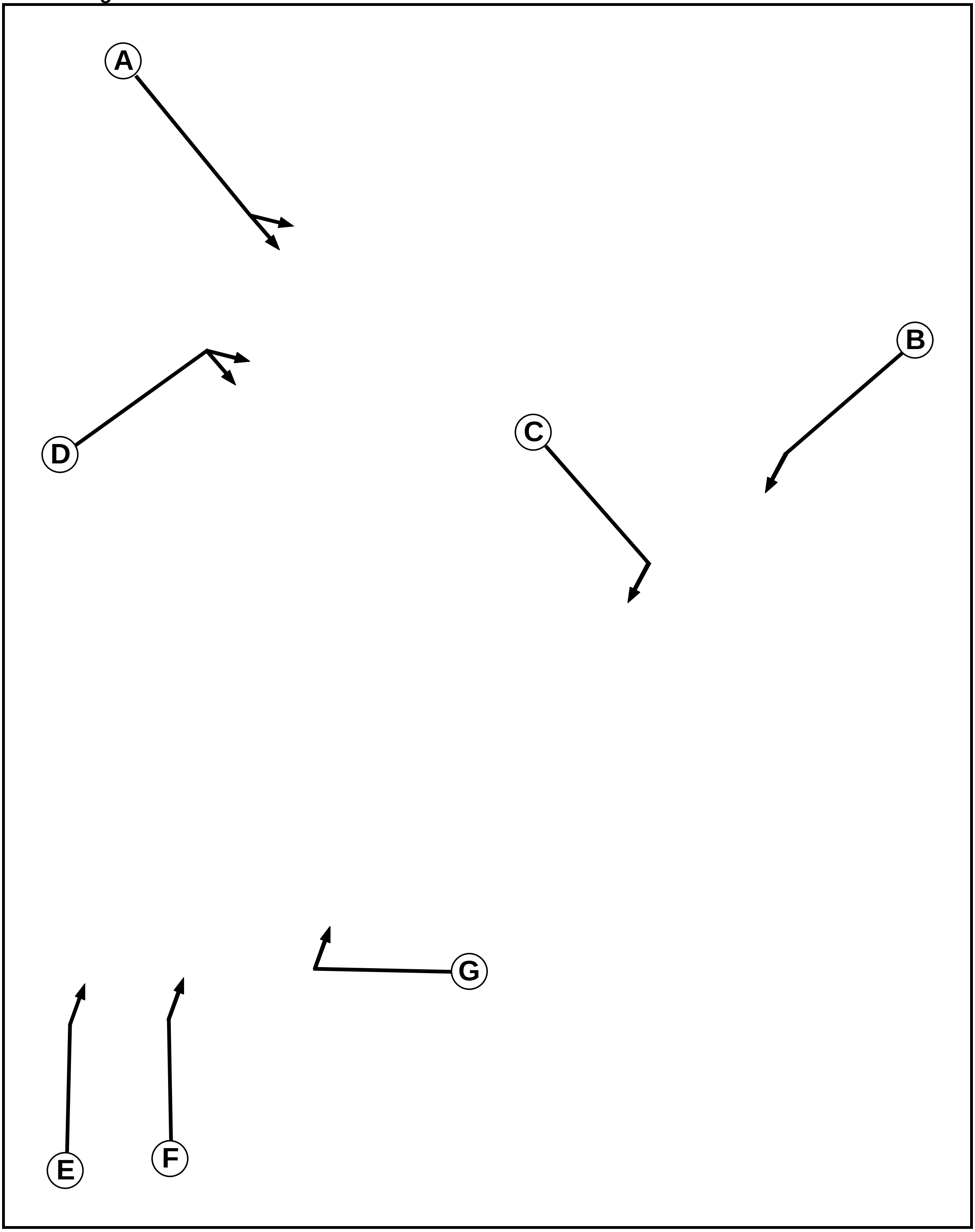
Project:	**Manston Airport DCO EIA**
Title:	**Junction 21b**
Location:	
File name:	Junction 21a+21b_Validated RevB_Revc_Mit - LF - PM.lsg3x
Author:	FOUDA
Company:	Wood
Address:	LEAMINGTON SPA- GABLES HOUSE, KENILWORTH-ROAD,WARWICKSHIRE CV32 6JX
Notes:	

Full Input Data And Results

Network Layout Diagram



Phase Diagram



Full Input Data And Results

Phase Input Data

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min	Cont Min
A	Traffic	1		7	7
B	Traffic	2		7	7
C	Traffic	2		7	7
D	Traffic	1		7	7
E	Traffic	3		7	7
F	Traffic	3		7	7
G	Traffic	3		7	7

Phase Intergreens Matrix

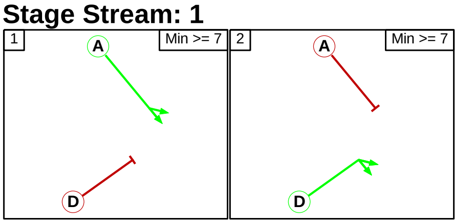
		Starting Phase						
		A	B	C	D	E	F	G
Terminating Phase	A		-	-	5	-	-	-
	B	-		5	-	-	-	-
	C	-	5		-	-	-	-
	D	5	-	-		-	-	-
	E	-	-	-	-		-	-
	F	-	-	-	-	-		-
	G	-	-	-	-	-	-	

Phases in Stage

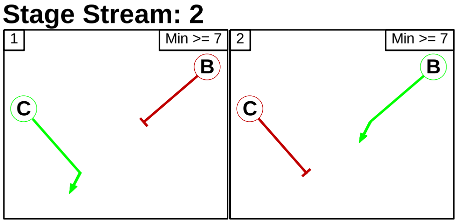
Stream	Stage No.	Phases in Stage
1	1	A
1	2	D
2	1	C
2	2	B
3	1	E F
3	2	G

Stage Diagram

Stage Stream: 1

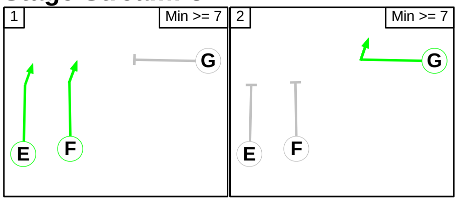


Stage Stream: 2



Full Input Data And Results

Stage Stream: 3



Phase Delays

Stage Stream: 1

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Stage Stream: 2

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Stage Stream: 3

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Prohibited Stage Change

Stage Stream: 1

	To Stage		
		1	2
From Stage	1		5
	2	5	

Stage Stream: 2

	To Stage		
		1	2
From Stage	1		5
	2	5	

Stage Stream: 3

	To Stage		
		1	2
From Stage	1		2
	2	2	

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)	850	0	12/2	0.12	All	-	-	-	-	-
				12/1	0.12	To 2/1 (Ahead)					
				12/3	0.12	All					
6/1 (A256 Canterburry Road exit)	22/1 (Ahead)	1000	0	18/1	0.33	To 22/2 (Right)	-	-	-	-	-
				18/2	0.33	All					
6/2 (A256 Canterburry Road exit)	22/2 (Ahead)	1000	0	18/1	0.33	To 22/2 (Right)	-	-	-	-	-
				18/2	0.33	All					
13/1 (A256 Haine Rd)	18/1 (Ahead)	850	0	16/1	0.33	To 18/1 (Right) To 18/2 (Right)	-	-	-	-	-
				16/2	0.33	All					
	18/2 (Ahead)	1000	0	16/1	1.09	To 18/1 (Right) To 18/2 (Right)					
				16/2	1.09	All					
14/1 (Canterbury Rd W)	20/1 (Ahead)	850	0	22/1	0.33	To 20/1 (Right) To 20/2 (Right)	-	-	-	-	-
				22/2	0.33	All					
14/2 (Canterbury Rd W)	20/2 (Ahead)	850	0	22/1	0.33	To 20/1 (Right) To 20/2 (Right)	-	-	-	-	-
				22/2	0.33	All					
19/1 (New Arm (north))	16/1 (Ahead)	850	0	20/1	0.33	To 16/1 (Right) To 16/2 (Right)	-	-	-	-	-
				20/2	0.33	All					
19/2 (New Arm (north))	16/2 (Ahead)	850	0	20/1	0.33	To 16/1 (Right) To 16/2 (Right)	-	-	-	-	-
				20/2	0.33	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	E	2	3	60.0	Geom	-	3.70	0.00	Y	Arm 10 Ahead	Inf
1/2 (Hengist Way south entry)	U	F	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 10 Ahead	Inf
1/3 (Hengist Way south entry)	U	F	2	3	14.0	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 Arm 11 Ahead	153.00 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)	O		2	3	60.0	Inf	-	-	-	-	-	-
6/2 (A256 Canterburry Road exit)	O		2	3	60.0	Inf	-	-	-	-	-	-
7/1 (Canterbury Road Entry)	U	B	2	3	10.0	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	G	2	3	5.0	Geom	-	3.40	0.00	Y	Arm 10 Right	17.00

9/2 (Circulatory 1)	U	G	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 (Circulatory 2)	U	D	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 8 Right	50.00
10/3 (Circulatory 2)	U	D	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 8 Right	50.00
											Arm 11 Right	12.00
11/1 (Circulatory 3)	U	C	2	3	60.0	Geom	-	4.25	0.00	Y	Arm 12 Right	Inf
11/2 (Circulatory 3)	U	C	2	3	60.0	Geom	-	4.25	0.00	N	Arm 12 Right	Inf
12/1 (Circulatory 4)	U		2	3	60.0	Inf	-	-	-	-	-	-
12/2 (Circulatory 4)	U		2	3	60.0	Inf	-	-	-	-	-	-
12/3 (Circulatory 4)	U		2	3	60.0	Inf	-	-	-	-	-	-
13/1 (A256 Haine Rd)	O		2	3	60.0	Geom	-	3.25	0.00	Y	Arm 18 Ahead	Inf
14/1 (Canterbury Rd W)	O		2	3	1.4	Inf	-	-	-	-	-	-
14/2 (Canterbury Rd W)	O		2	3	60.0	Inf	-	-	-	-	-	-
15/1 (Canterbury Rd W Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
16/1	U		2	3	60.0	Inf	-	-	-	-	-	-
16/2	U		2	3	60.0	Inf	-	-	-	-	-	-
17/1 (A256 - EXIT)	U		2	3	60.0	Inf	-	-	-	-	-	-
18/1	U		2	3	60.0	Inf	-	-	-	-	-	-
18/2	U		2	3	60.0	Inf	-	-	-	-	-	-
19/1 (New Arm (north))	O		2	3	8.3	Inf	-	-	-	-	-	-
19/2 (New Arm (north))	O		2	3	60.0	Inf	-	-	-	-	-	-
20/1	U		2	3	60.0	Inf	-	-	-	-	-	-
20/2	U		2	3	60.0	Inf	-	-	-	-	-	-
21/1	U		2	3	60.0	Inf	-	-	-	-	-	-
22/1	U		2	3	60.0	Inf	-	-	-	-	-	-
22/2	U		2	3	60.0	Inf	-	-	-	-	-	-

Full Input Data And Results

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2039 Base AM'	07:45	08:45	01:00	
2: '2039 Base PM'	16:45	17:45	01:00	
3: '98 AM'	07:45	08:45	01:00	
4: '98 PM'	16:45	17:45	01:00	

Scenario 1: '98 PM' (FG4: '98 PM', Plan 1: 'Base')

Traffic Flows, Desired

Desired Flow :

	Destination							
Origin		A	B	C	D	E	F	Tot.
	A	0	168	685	15	3	156	1027
	B	135	0	4	10	2	100	251
	C	1052	11	0	83	17	845	2008
	D	25	12	66	0	6	298	407
	E	8	4	20	1	0	1	34
	F	306	144	797	68	1	52	1368
	Tot.	1526	339	1572	177	29	1452	5095

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 1: 98 PM
Junction: Junction 21B	
1/1	945
1/2 (with short)	1063(In) 524(Out)
1/3 (short)	539
2/1	574
2/2	998
3/1	251
4/1	339
5/1	727
5/2	655
6/1	519
6/2	712
7/1 (short)	514
7/2 (with short)	1027(In) 513(Out)
8/1	943
8/2	583
9/1 (short)	366
9/2 (with short)	425(In) 59(Out)
10/1	1231
10/2	604
10/3	598
11/1	399
11/2	659
12/1	913
12/2	998
12/3	174
13/1	34
14/1 (short)	318
14/2 (with short)	407(In) 89(Out)
15/1	177
16/1	790
16/2	709
17/1	29
18/1	1468
18/2	36
19/1 (short)	711

Full Input Data And Results

19/2 (with short)	1368(In) 657(Out)
20/1	1483
20/2	100
21/1	1452
22/1	640
22/2	713

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	46.6 %	1954	1954
				Arm 11 Ahead	30.00	53.4 %		
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
6/2 (A256 Canterburry Road exit Lane 2)	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 Right	50.00	100.0 %	1922	1922
10/3 (Circlulatory 2)	3.65	0.00	Y	Arm 8 Right	50.00	97.5 %	1918	1918
				Arm 11 Right	12.00	2.5 %		
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	N	Arm 12 Right	Inf	100.0 %	2180	2180

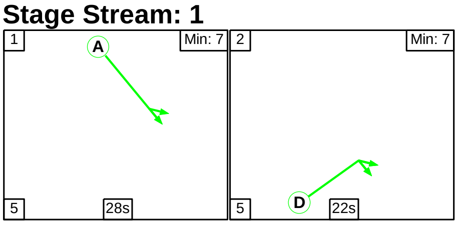
Full Input Data And Results

12/1 (Circulatory 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
13/1 (A256 Haine Rd)	3.25	0.00	Y	Arm 18 Ahead	Inf	100.0 %	1940	1940
14/1 (Canterbury Rd W Lane 1)	Infinite Saturation Flow						Inf	Inf
14/2 (Canterbury Rd W Lane 2)	Infinite Saturation Flow						Inf	Inf
15/1 (Canterbury Rd W Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
16/1	Infinite Saturation Flow						Inf	Inf
16/2	Infinite Saturation Flow						Inf	Inf
17/1 (A256 - EXIT Lane 1)	Infinite Saturation Flow						Inf	Inf
18/1	Infinite Saturation Flow						Inf	Inf
18/2	Infinite Saturation Flow						Inf	Inf
19/1 (New Arm (north) Lane 1)	Infinite Saturation Flow						Inf	Inf
19/2 (New Arm (north) Lane 2)	Infinite Saturation Flow						Inf	Inf
20/1	Infinite Saturation Flow						Inf	Inf
20/2	Infinite Saturation Flow						Inf	Inf
21/1	Infinite Saturation Flow						Inf	Inf
22/1	Infinite Saturation Flow						Inf	Inf
22/2	Infinite Saturation Flow						Inf	Inf

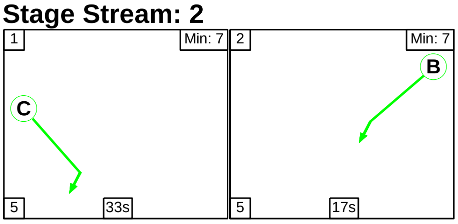
Scenario 1: '98 PM' (FG4: '98 PM', Plan 1: 'Base')

Stage Sequence Diagram

Stage Stream: 1

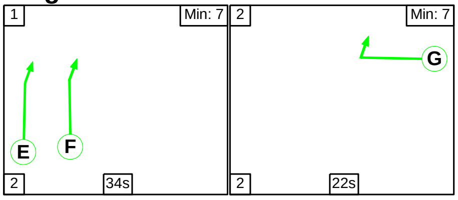


Stage Stream: 2



Full Input Data And Results

Stage Stream: 3



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	28	22
Change Point	35	8

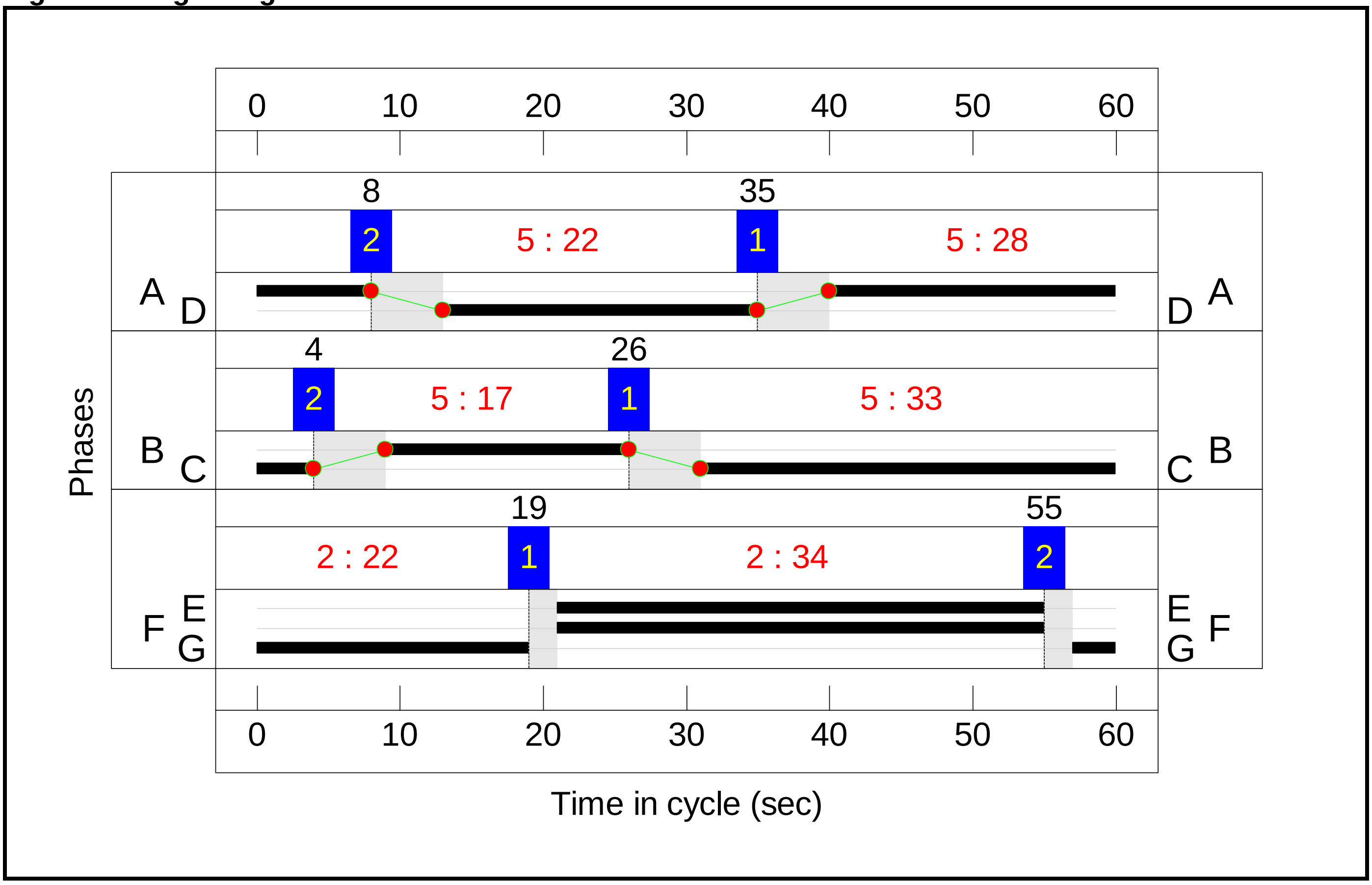
Stage Stream: 2

Stage	1	2
Duration	33	17
Change Point	26	4

Stage Stream: 3

Stage	1	2
Duration	34	22
Change Point	19	55

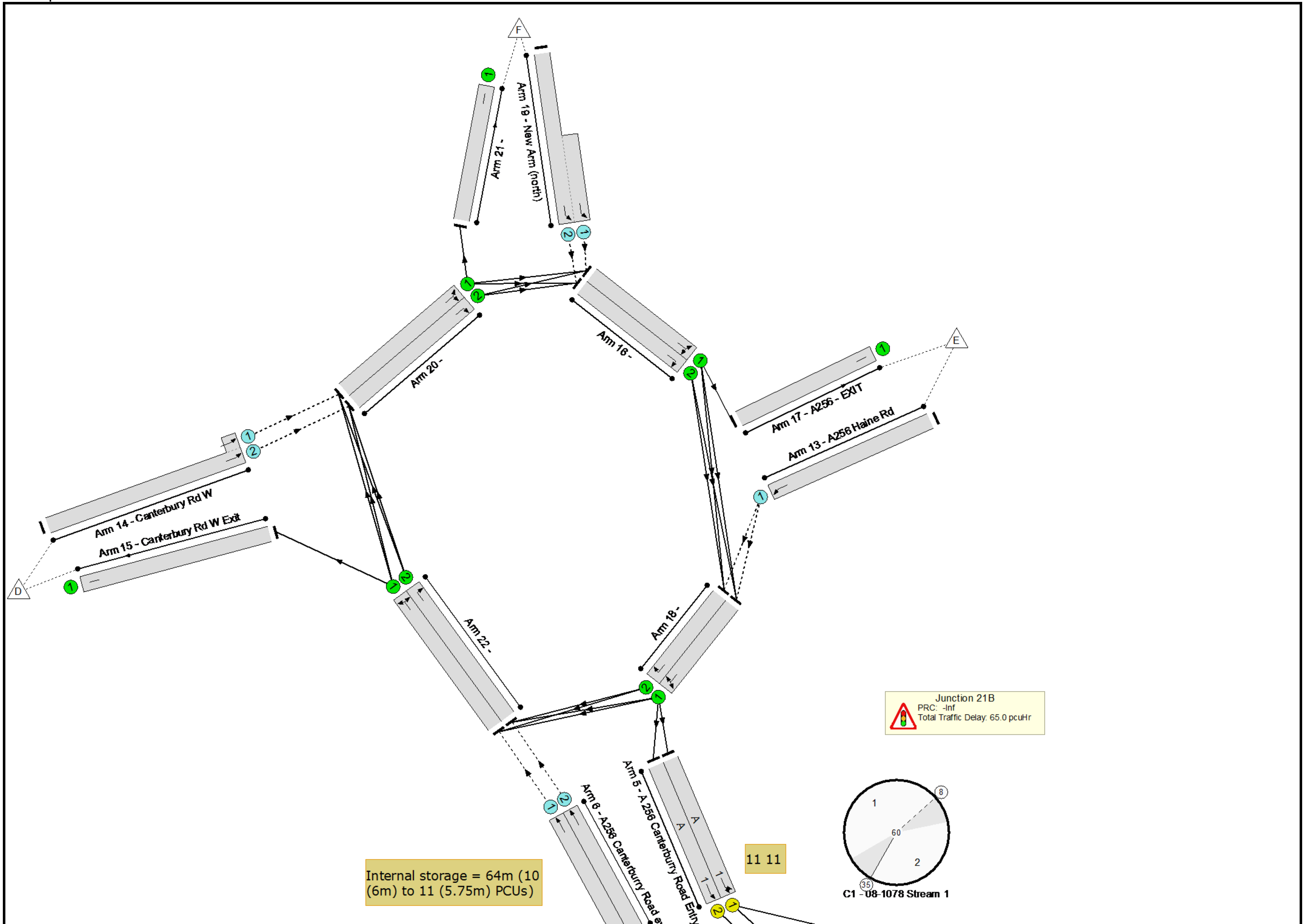
Signal Timings Diagram



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**	-	-		-	-	-	-	-	-	**Inf %**
Junction 21B	-	-	**N/A**	-	-		-	-	-	-	-	-	**Inf %**
1/1	Hengist Way south entry Ahead	U	3	N/A	E		1	34	-	945	1985	1158	81.6%
1/2+1/3	Hengist Way south entry Ahead	U	3	N/A	F		1	34	-	1063	1980:1980	976+1003	53.7 : 53.7%
2/1	Hengist Way south exit	U	N/A	N/A	-		-	-	-	574	Inf	Inf	0.0%
2/2	Hengist Way south exit	U	N/A	N/A	-		-	-	-	998	Inf	Inf	0.0%
3/1	Sandwich Road entry Ahead	O	N/A	N/A	-		-	-	-	251	1908	643	39.0%
4/1	Sandwich Road exit	U	N/A	N/A	-		-	-	-	339	Inf	Inf	0.0%
5/1	A 256 Canterbury Road Entry Left Ahead	U	1	N/A	A		1	28	-	727	1954	944	73.6%
5/2	A 256 Canterbury Road Entry Ahead	U	1	N/A	A		1	28	-	655	1919	928	70.6%
6/1	A256 Canterburry Road exit Ahead	O	N/A	N/A	-		-	-	-	519	Inf	988	52.5%
6/2	A256 Canterburry Road exit Ahead	O	N/A	N/A	-		-	-	-	712	Inf	988	72.1%
7/2+7/1	Canterbury Road Entry Left	U	2	N/A	B		1	17	-	1027	1828:1828	548+548	93.5 : 93.7%
8/1	Canterbury Road exit	U	N/A	N/A	-		-	-	-	943	Inf	Inf	0.0%
8/2	Canterbury Road exit	U	N/A	N/A	-		-	-	-	583	Inf	Inf	0.0%

Full Input Data And Results

9/2+9/1	Circulatory 1 Right	U	3	N/A	G		1	22	-	425	1766:1796	102+634	57.7 : 57.7%
10/1	Circulatory 2 Left	U	N/A	N/A	-		-	-	-	1231	Inf	Inf	0.0%
10/2	Circulatory 2 Right	U	1	N/A	D		1	22	-	604	1922	737	82.0%
10/3	Circulatory 2 Right Right2	U	1	N/A	D		1	22	-	598	1918	735	81.3%
11/1	Circulatory 3 Right	U	2	N/A	C		1	33	-	399	2040	1156	32.4%
11/2	Circulatory 3 Right	U	2	N/A	C		1	33	-	659	2180	1235	53.3%
12/1	Circulatory 4 Ahead Left	U	N/A	N/A	-		-	-	-	913	Inf	Inf	0.0%
12/2	Circulatory 4 Ahead	U	N/A	N/A	-		-	-	-	998	Inf	Inf	0.0%
12/3	Circulatory 4 Right	U	N/A	N/A	-		-	-	-	174	Inf	Inf	0.0%
13/1	A256 Haine Rd Ahead	O	N/A	N/A	-		-	-	-	34	1940	0	Inf %
14/2+14/1	Canterbury Rd W Ahead	O	N/A	N/A	-		-	-	-	407	Inf : Inf	129+462	68.8 : 68.8%
15/1	Canterbury Rd W Exit	U	N/A	N/A	-		-	-	-	177	Inf	Inf	0.0%
16/1	Left Right	U	N/A	N/A	-		-	-	-	790	Inf	Inf	0.0%
16/2	Right	U	N/A	N/A	-		-	-	-	709	Inf	Inf	0.0%
17/1	A256 - EXIT	U	N/A	N/A	-		-	-	-	29	Inf	Inf	0.0%
18/1	Left Right	U	N/A	N/A	-		-	-	-	1468	Inf	Inf	0.0%
18/2	Right	U	N/A	N/A	-		-	-	-	36	Inf	Inf	0.0%
19/2+19/1	New Arm (north) Ahead	O	N/A	N/A	-		-	-	-	1368	Inf : Inf	807+807	81.4 : 88.1%
20/1	Right Ahead	U	N/A	N/A	-		-	-	-	1483	Inf	Inf	0.0%
20/2	Right	U	N/A	N/A	-		-	-	-	100	Inf	Inf	0.0%
21/1		U	N/A	N/A	-		-	-	-	1452	Inf	Inf	0.0%
22/1	Left Right	U	N/A	N/A	-		-	-	-	640	Inf	Inf	0.0%
22/2	Right	U	N/A	N/A	-		-	-	-	713	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	**-**	**-**	**5032**	**0**	**0**	**24.2**	**40.8**	**0.0**	**65.0**	**-**	**-**	**-**	**-**
Junction 21B	**-**	**-**	**5032**	**0**	**0**	**24.2**	**40.8**	**0.0**	**65.0**	**-**	**-**	**-**	**-**
1/1	945	945	-	-	-	2.6	2.2	-	4.8	18.2	12.3	2.2	14.5
1/2+1/3	1063	1063	-	-	-	2.1	0.6	-	2.7	9.1	5.1	0.6	5.7
2/1	554	554	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
2/2	998	998	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
3/1	251	251	251	0	0	0.0	0.3	-	0.3	4.6	0.0	0.3	0.3
4/1	335	335	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	695	695	-	-	-	2.4	1.4	-	3.8	19.6	9.3	1.4	10.6
5/2	655	655	-	-	-	2.2	1.2	-	3.4	18.7	8.6	1.2	9.7
6/1	519	519	519	0	0	0.0	0.6	-	0.6	3.8	0.0	0.6	0.6
6/2	712	712	712	0	0	0.1	1.3	-	1.3	6.8	6.4	1.3	7.6
7/2+7/1	1027	1027	-	-	-	5.8	6.2	-	12.1	42.3	8.3	6.2	14.5
8/1	935	935	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	583	583	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/2+9/1	425	425	-	-	-	2.4	0.7	-	3.1	26.3	5.1	0.7	5.7
10/1	1231	1231	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
10/2	604	604	-	-	-	2.1	2.2	-	4.3	25.5	5.1	2.2	7.3
10/3	598	598	-	-	-	2.2	2.1	-	4.3	25.8	5.0	2.1	7.1
11/1	375	375	-	-	-	0.3	0.2	-	0.5	5.0	0.8	0.2	1.0
11/2	659	659	-	-	-	0.5	0.6	-	1.1	5.8	1.3	0.6	1.9
12/1	889	889	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
12/2	998	998	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
12/3	174	174	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
13/1	34	0	0	0	0	1.4	17.5	-	18.9	2002.0	1.7	17.5	19.2

Full Input Data And Results

14/2+14/1	407	407	814	0	0	0.1	1.1	-	1.2	10.2	2.3	1.1	3.4
15/1	176	176	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
16/1	790	790	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
16/2	709	709	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
17/1	29	29	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
18/1	1436	1436	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
18/2	34	34	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
19/2+19/1	1368	1368	2736	0	0	0.0	2.7	-	2.7	7.2	0.0	2.7	2.7
20/1	1483	1483	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
20/2	100	100	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
21/1	1452	1452	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
22/1	639	639	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
22/2	713	713	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 - 08-1078 Stream: 1 PRC for Signalled Lanes (%): 9.8 Total Delay for Signalled Lanes (pcuHr): 15.74 Cycle Time (s): 60
C1 - 08-1078 Stream: 2 PRC for Signalled Lanes (%): -4.1 Total Delay for Signalled Lanes (pcuHr): 13.66 Cycle Time (s): 60
C1 - 08-1078 Stream: 3 PRC for Signalled Lanes (%): 10.3 Total Delay for Signalled Lanes (pcuHr): 10.58 Cycle Time (s): 60
PRC Over All Lanes (%): -Inf Total Delay Over All Lanes(pcuHr): 64.97

LinSig V1 style report

User and Project Details

Project:	**Manston Airport DCO TA**
Title:	**Jct 26_Manston Rd_B2014**
Location:	
File name:	Signalised Option_R0 - PM.lsg3x
Author:	FOUDA
Company:	
Address:	
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
D	Pedestrian		6	6
E	Pedestrian		6	6

Phase Intergreens Matrix

		Starting Phase				
		A	B	C	D	E
Terminating Phase	A		-	5	-	10
	B	-		5	-	7
	C	5	5		6	-
	D	-	-	6		-
	E	5	5	-	-	

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		10
	2	6	

Phases in Stage

Stage No.	Phases in Stage
1	A B D
2	C E

Give-Way Lane Input Data

Junction: Jct 26_Manston Rd_B2014											
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)**
2/1 (Newington Road North Entry)	4/1 (Right)	1439	0	6/2	1.09	All	3.00	3.00	0.50	3	3.00
				6/1	1.09	All					

Lane Input Data

Junction: Jct 26_Manston Rd_B2014

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 Entry)	U	C	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 3 Left	15.00
											Arm 5 Right	15.00
2/1 (Newington Road North Entry)	O	A	2	3	60.0	Geom	-	2.50	0.00	Y	Arm 4 Right	20.00
											Arm 5 Ahead	Inf
3/1 (Newington Road North Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
4/1 (Manston Road Exit_Crossing)	U		2	3	60.0	Inf	-	-	-	-	-	-
5/1 (Newington Road South Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
6/1 (Newington Road South Entry)	U	B	2	3	2.0	Geom	-	3.70	0.00	Y	Arm 4 Left	15.00
6/2 (Newington Road South Entry)	U	B	2	3	60.0	Geom	-	2.60	0.00	Y	Arm 3 Ahead	Inf
7/1 (Manston Road Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-

Lane Saturation Flows

Scenario 1: '2039 + Dev Traffic PM Peak' (FG2: '2039 + Dev Traffic PM Peak', Plan 1: 'Network Control Plan 1')

Junction: Jct 26_Manston Rd_B2014								
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 Entry)	3.65	0.00	Y	Arm 3 Left	15.00	27.8 %	1800	1800
				Arm 5 Right	15.00	72.2 %		
2/1 (Newington Road North Entry)	2.50	0.00	Y	Arm 4 Right	20.00	21.7 %	1835	1835
				Arm 5 Ahead	Inf	78.3 %		
3/1 (Newington Road North Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
4/1 (Manston Road Exit_Crossing Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Newington Road South Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Newington Road South Entry)	3.70	0.00	Y	Arm 4 Left	15.00	100.0 %	1805	1805
6/2 (Newington Road South Entry)	2.60	0.00	Y	Arm 3 Ahead	Inf	100.0 %	1875	1875
7/1 (Manston Road Exit Lane 1)	Infinite Saturation Flow						Inf	Inf

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2039 + Dev Traffic AM Peak'	07:45	08:45	01:00	
2: '2039 + Dev Traffic PM Peak'	16:45	17:45	01:00	

Traffic Flows, Desired

FG1: '2039 + Dev Traffic AM Peak'

Desired Flow :

	Destination				
		A	B	C	Tot.
Origin	A	0	428	155	583
	B	534	0	433	967
	C	205	324	0	529
	Tot.	739	752	588	2079

FG2: '2039 + Dev Traffic PM Peak'
Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	360	100	460
	B	523	0	326	849
	C	179	465	0	644
	Tot.	702	825	426	1953

Stage Timings

Scenario 1: '2039 + Dev Traffic PM Peak' (FG2: '2039 + Dev Traffic PM Peak', Plan 1: 'Network Control Plan 1')

Stage	**1**	**2**
Duration	59	45
Change Point	0	65

LinSig V1 style report

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: Jct 26_Manston Rd_B2014	-	-	**N/A**	-	-		-	-	-	-	-	-	**87.1%**
Jct 26_Manston Rd_B2014	-	-	**N/A**	-	-		-	-	-	-	-	-	**87.1%**
1/1	Manston Road Entry Left Right	U	N/A	N/A	C		1	49	-	644	1800	750	85.9%
2/1	Newington Road North Entry Right Ahead	O	N/A	N/A	A		1	60	-	460	1835	567	81.1%
3/1	Newington Road North Exit	U	N/A	N/A	-		-	-	-	702	Inf	Inf	0.0%
4/1	Manston Road Exit_Crossing Ahead	U	N/A	N/A	-		-	-	-	426	Inf	Inf	0.0%
5/1	Newington Road South Exit	U	N/A	N/A	-		-	-	-	825	Inf	Inf	0.0%
6/2+6/1	Newington Road South Entry Ahead Left	U	N/A	N/A	B		1	60	-	849	1875:1805	601+374	87.1 : 87.1%
7/1	Manston Road Exit	U	N/A	N/A	-		-	-	-	426	Inf	Inf	0.0%
Ped Link: P1	Unnamed Ped Link	-	N/A	-	D		1	59	-	0	-	35400	0.0%
Ped Link: P2	Unnamed Ped Link	-	N/A	-	E		1	45	-	0	-	27000	0.0%

LinSig V1 style report

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: Jct 26_Manston Rd_B2014	**-**	**-**	**64**	**0**	**36**	**14.0**	**8.2**	**1.0**	**23.2**	**-**	**-**	**-**	**-**
Jct 26_Manston Rd_B2014	**-**	**-**	**64**	**0**	**36**	**14.0**	**8.2**	**1.0**	**23.2**	**-**	**-**	**-**	**-**
1/1	644	644	-	-	-	5.7	2.9	-	8.6	47.9	19.3	2.9	22.2
2/1	460	460	64	0	36	2.5	2.1	1.0	5.5	43.3	10.0	2.1	12.0
3/1	702	702	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/1	426	426	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	825	825	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2+6/1	849	849	-	-	-	5.9	3.2	-	9.1	38.5	23.3	3.2	26.5
7/1	426	426	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
Ped Link: P1	0	0	-	-	-	-	-	-	0.0	0.0	-	-	0.0
Ped Link: P2	0	0	-	-	-	-	-	-	0.0	0.0	-	-	0.0

C1 PRC for Signalled Lanes (%): 3.4 Total Delay for Signalled Lanes (pcuHr): 23.17 Cycle Time (s): 120
PRC Over All Lanes (%): 3.4 Total Delay Over All Lanes(pcuHr): 23.17

Junctions 9

ARCADY 9 - Roundabout Module

Filename: Jct 27_R1_PM validated_MIT.j9
Path: V:\Projects\38199 Manston Airport DCO EIA\4 Design\Transport\MAY 2019 - Jucntion Moddeling - URGENT\Mitigation Schemes Models to Use\Junction 27
Report generation date: 20/05/2019 12:36:23

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

Summary of junction performance

	PM			
	Queue (Veh)	Delay (s)	RFC	LOS
	2039 + Dev Traffic			
1 - Newington Road north	61.9	257.49	1.13	F
2 - High Street east	72.6	261.46	1.14	F
3 - High Street south	99.2	341.66	1.18	F

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

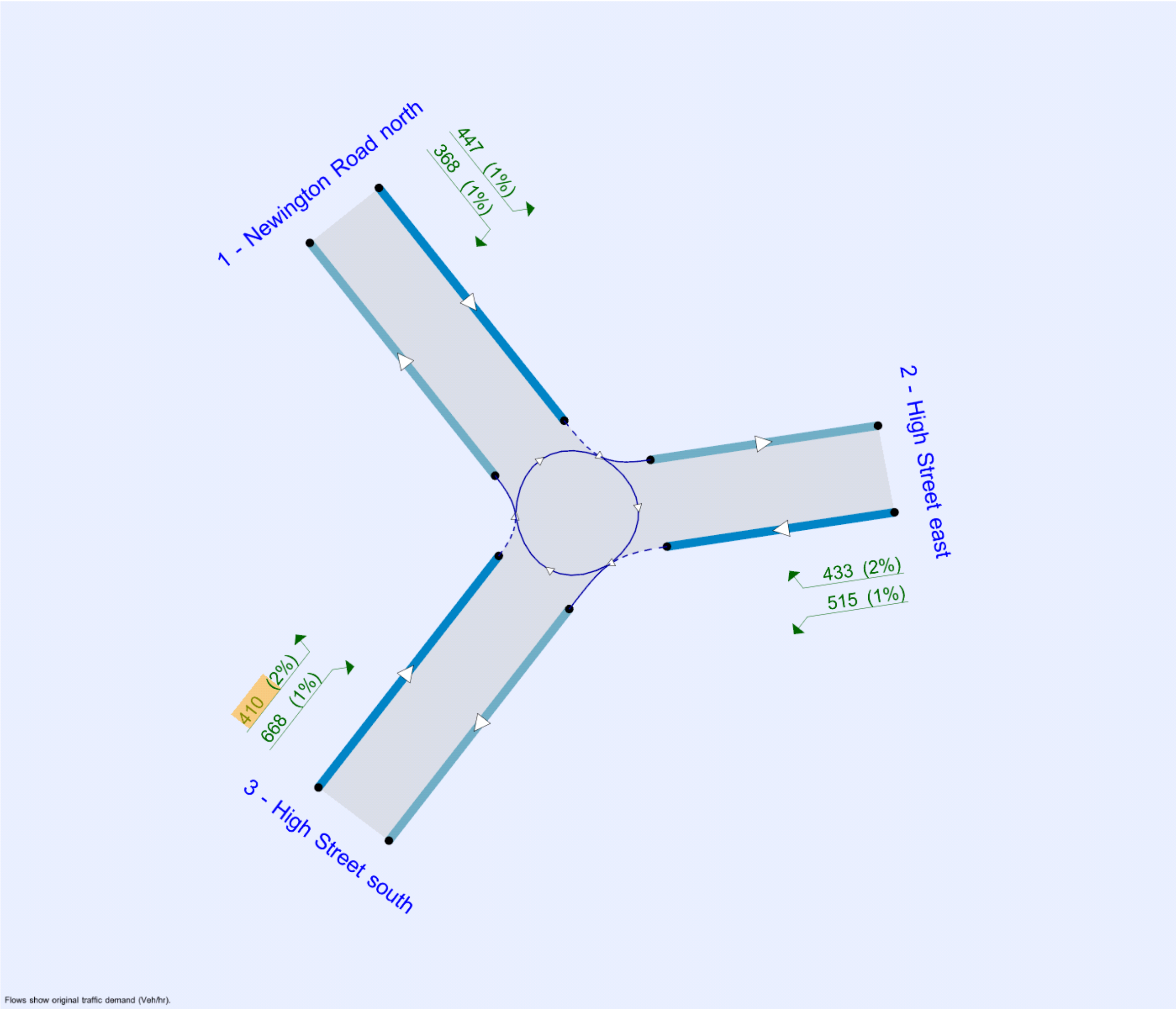
File summary

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	s	-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 (s)	Queue threshold (PCU)
JUNCTIONS 9	5.75				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

2039 + Dev Traffic, 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	Mini-roundabout		1, 2, 3	290.78	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	3.50	5.54	3.1	13.95	8.20	0.0	
2 - High Street east	3.00	3.00	5.01	20.4	17.90	15.90	0.0	✓
3 - High Street south	3.58	3.28	5.97	14.0	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	0.635	857
2 - High Street east	0.576	1139
3 - High Street south	0.666	1123

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
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 - Newington Road north		ONE HOUR	✓	815	100.000
2 - High Street east		ONE HOUR	✓	948	100.000
3 - High Street south		ONE HOUR	✓	1078	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	447	368
	2 - High Street east	433	0	515
	3 - High Street south	410	668	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	1	1
	2 - High Street east	2	0	1
	3 - High Street south	2	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - Newington Road north	1.13	257.49	61.9	F	748	1122
2 - High Street east	1.14	261.46	72.6	F	870	1305
3 - High Street south	1.18	341.66	99.2	F	989	1484

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 (s)	Unsignalised level of service
1 - Newington Road north	614	153	496	934	0.657	606	626	0.0	1.8	10.755	B
2 - High Street east	714	178	274	966	0.739	703	828	0.0	2.7	13.208	B
3 - High Street south	812	203	321	1089	0.745	800	656	0.0	2.8	12.057	B

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 (s)	Unsignalised level of service
1 - Newington Road north	733	183	585	835	0.878	717	740	1.8	5.7	27.589	D
2 - High Street east	852	213	324	937	0.909	834	979	2.7	7.3	30.330	D
3 - High Street south	969	242	381	1040	0.932	945	777	2.8	8.9	31.593	D

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 (s)	Unsignalised level of service
1 - Newington Road north	897	224	622	794	1.131	781	797	5.7	34.7	108.254	F
2 - High Street east	1044	261	353	921	1.134	910	1051	7.3	40.9	108.989	F
3 - High Street south	1187	297	415	1012	1.173	1004	847	8.9	54.5	125.904	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 (s)	Unsignalised level of service
1 - Newington Road north	897	224	625	791	1.134	789	802	34.7	61.9	231.803	F
2 - High Street east	1044	261	356	919	1.136	917	1057	40.9	72.6	232.830	F
3 - High Street south	1187	297	419	1009	1.176	1008	854	54.5	99.2	282.808	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 (s)	Unsignalised level of service
1 - Newington Road north	733	183	621	795	0.922	782	796	61.9	49.5	257.490	F
2 - High Street east	852	213	353	920	0.926	908	1050	72.6	58.7	261.461	F
3 - High Street south	969	242	415	1013	0.957	1002	846	99.2	90.9	341.662	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 (s)	Unsignalised level of service
1 - Newington Road north	614	153	621	795	0.772	779	795	49.5	8.1	140.429	F
2 - High Street east	714	178	352	921	0.775	906	1048	58.7	10.8	144.376	F
3 - High Street south	812	203	414	1013	0.801	1002	844	90.9	43.2	243.422	F

Appendix ISH7 – 44

Technical note:
RSA Stage 1: Designers Response – Manston Road/Manston Court Road Junction

1. Introduction

This Technical Note forms the Designers Response to the Stage 1 Road Safety Audit (RSA) conducted by Baddingham Limited for a mitigation proposal of Manston Road/Manston Court Road junction. The development forms part of the Manston Airport DCO submission.

Baddingham Limited has been provided with the latest preliminary scheme design for the Manston Road/Manston Court Road junction, the design is a three-arm signalised junction based on the guidance of the Design Manual for Road and Bridges (DMRB).

The Designers response to each of the issues raised by the Safety Audit Team is provided in the following sections. The text included within the RSA has been transposed in to this document, a full copy of the original RSA is provided within **Appendix A**.

2. Designers Response

Problem 3.1

Location: B2050/Manston Court Road junction.

Summary: Potential collisions involving HGVs.

The swept path assessment for an HGV turning left from the B2050 into Manston Court Road suggests that there is a possibility of a side-swipe collision with a vehicle waiting at the stop line in Manston Court Road possibly resulting in injuries to vehicle occupants.

The swept path assessment is undertaken for a 10metre rigid HGV. There is no analysis for an articulated HGV. There are a number of caravan parks served by Manor Court Road together with a large solar panel facility.

Manston Court Road (later becoming Star Lane) is signed at both ends as unsuitable for HGVs. It is not clear how servicing of the mentioned facilities via this highway is undertaken and there is a possibility that articulated HGVs could turn at this junction.

Recommendation: It is recommended that a swept path assessment is undertaken for an articulated vehicle and the junction geometry modified as necessary to provide safe and efficient access.

Designers Response: A swept path assessment of the proposed junction design using an articulated HGV vehicle is provided in **Appendix B**. The vehicle used was 16.5m in length and represented the maximum legal length of an articulated HGV (UK). The swept path assessment assessed all the movements into and from the proposed Manston Road/Manston Court Road junction. The results show that the proposed design is sufficient to accommodate large vehicle movements.

Problem 3.2

Location: B2050/Manston Court Road junction.

Summary: Potential lack of forward visibility.

Driver forward visibility on the westbound Manston Road approach may be compromised by the sweeping bend in this location and also the raised verge north of the B2050. Lack of sufficient visibility may lead to late-braking decisions, skids, and loss-of-control type incidents resulting in collisions with traffic at the signal junction leading to possible injuries to vehicle occupants.

Recommendation: It is recommended that appropriate unobstructed forward visibility is provided.

Designers Response: The proposed junction layout will not change the existing forward visibility. However, the proposed junction layout will improve the existing forward visibility and will provide required inter-visibility.

Problem 3.3

Location: B2050/Manston Court Road junction.

Summary: Potential for drivers to make use of hatched area for overtaking.

The central hatched markings may encourage some users, such as motorcyclists or cyclists to seek to over-take vehicles waiting or moving-off from the B2050 stop lines. This may lead to collisions and result in possible injuries to motorcyclists or cyclists.

Recommendation: It is recommended that the hatched markings are enclosed with solid continuous white lines to discourage overtaking and that advance cycle stop lines are provided to provide facilities for cyclists.

Designers Response: The concept design drawing for the junction has been amended to include a solid continuous line along the off-side hatched markings, as shown in **Appendix B**. In terms of cycle stop line, it is noted that there is no other cycle provision on the road network and little demand for this provision. However, providing cycle stop line will be considered in detailed design stage.

Problem 3.4

Location: B2050/Manston Court Road junction.

Summary: Potential for carriageway condition to lead to collisions.

The B2050 and Manston Court Road carriageways in the vicinity of the junction are of poor condition with evidence of potholes, fretting and deteriorating trench reinstatement. Lack of effective skid resistance may lead to skid and loss-of- control type incidents, resulting in collisions between vehicles or involving motorcyclists or cyclists, resulting in injuries.

Recommendation: It is recommended that the B2050 and Manston Court Road wearing course is renewed.

Designers Response: Road will be resurfaced within the extent of the junction as it is a part of the proposed scheme.

Problem 3.5

Location: B2050/Manston Court Road junction.

Summary: Lack of inter-visibility with bridleway.

No intervisibility is shown with the existing bridleway, which is currently compromised by a hoarding. Lack of inter-visibility may lead to collisions between equestrians and vehicles at the junction resulting in possible injuries to horse and rider.

Recommendation: It is recommended that appropriate inter-visibility is provided in this location.

Designers Response: It is not proposed as a result of proposals at the junction that the currently intervisability for the bridleway will changed. The land surrounded by hoardings that is the main impediment to the visibility is not part of the Manston Airport proposals.

3. General Comments

None

Issued by

[redacted]

Approved by

Bev Coupe

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Our Ref: 0781/AS

Your Ref:

For the attention of G. Price

Wood plc
Canon Court
Abbey Lawn
Abbey Forgate
Shrewsbury
SY2 5DE

By email

13th June 2018

Dear Glyn,

MANSTON AIRPORT – JUNCTION 13 – RSA1 & DESIGNER'S RESPONSE

We are in receipt of your recent email and attachments:

- 40820R17I15008622 Designers Response to RSA1

Our Road Safety Audit Team has reviewed the proposals to address the issues raised in the Road Safety Audit Stage 1 (Preliminary Design Stage) report in respect of the above and confirm that the measures proposed in the Designer's Response appear appropriate in road safety terms and that we have no further observations to make.

We trust the above is satisfactory but should you need any clarification or assistance please do not hesitate to get in contact.

Yours sincerely,

[redacted]

Anthony R. J. Setter
Director

Badingham Limited. Head Office: 16 Ashley Piece, Wiltshire, UK. SN8 2QE | Registered Office: 43-45 Devizes Road, Swindon, UK. SN1 4BG
Company No. 6961250 | VAT Reg. No. 994 3305 95 | ISO 9001:2008 Registered Firm. Certificate No. GB2004112 | www.badinghamuk.com

Appendix ISH7 – 45

Technical note:
Emergency Accesses

1. Introduction

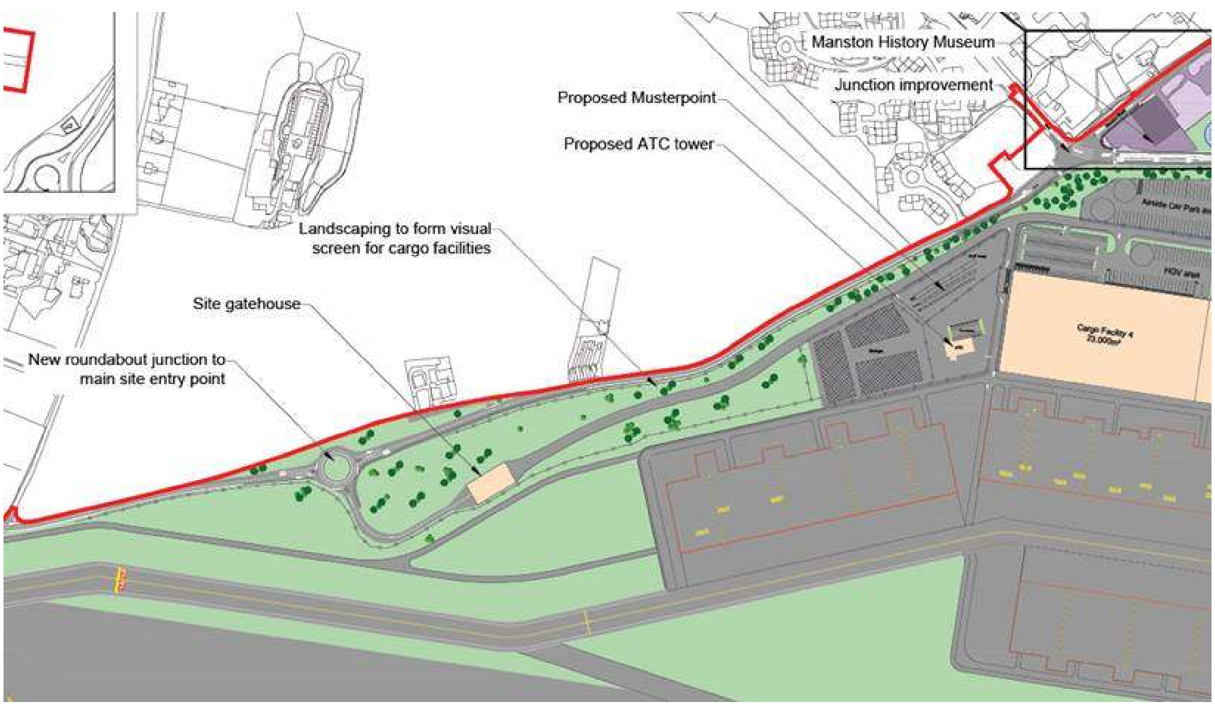
1.1.1 This Technical Note has been produced in response to the following request at Issue Specific Hearing 6, Transport, held on 6 June 2019:

- Action 45 - Provide a note on the intended locations of emergency accesses and how these might be appropriately secured at this stage of the examination.

2. Emergency Access

2.1.1 The emergency accesses shown in Appendix TR2.47a and TR2.47b are for the use of Airport Rescue and Fire Fighting Service in the event of an incident outside of the airfield boundary. If an incident occurs in the vicinity of the airport, these emergency accesses will be used by the airport emergency teams to access the location as quickly as possible in an effort to reduce casualties. These accesses are not for general use and are only provided for emergency vehicles to exit the airfield, not for entry.

2.1.2 These emergency accesses are not for use by external emergency services wanting to enter into the airfield. Traditional emergency services responding to an incident inside the airfield boundary will use the roundabout access constructed on spitfire way to enter the airport. They will then rendezvous at the 'Muster Point' shown on the Masterplan, adjacent to the Air Traffic Control Tower before being let into the airfield site (see below). This is also identified as the Green Circle on Drawing 2076 included at the end of this document.



2.1.3 References for a requirement to consider emergency access through the airport boundary fence is captured below:

- International Civil Aviation Organization (ICAO) 9157 Part 6 Frangibility[1]

2.1.16 The fence should be provided with gates to allow for vehicle access to the movement area and for convenient access to areas outside the airport boundary by rescue and fire fighting vehicles. Gates, in particular heavy, remote-controlled gates, should be positioned outside of operational areas and as far away as possible from the runway or its extended centre line to minimize the structural damage to an aeroplane in the event of it colliding with a fence or its gates. Furthermore, so-called "crash gates" should be used to provide rescue and fire fighting vehicles easy access to areas outside the airport boundary.

- ICAO Annex 14 Vol 1[2]

9.2.34 **Recommendation.—** *Emergency access roads should be provided on an aerodrome where terrain conditions permit their construction, so as to facilitate achieving minimum response times. Particular attention should be given to the provision of ready access to approach areas up to 1 000 m from the threshold, or at least within the aerodrome boundary. Where a fence is provided, the need for convenient access to outside areas should be taken into account.*

2.1.4 Given the infrequent / one-off nature of these emergency egress points it was not considered relevant to include them in the highways and access plans.

2.1.5 It is considered that if these gates were ever required for a use other than emergency egress from the site, that suitable risk assessments and evaluation would need to take place with KCC prior to use, however this is not the intended function of the emergency accesses shown on Appendix TR2.47a & b. There have been cases of airfields using these gates for other activities such as construction access but this would need to be assessed separately and is not the reason for providing the access points.

2.1.6 A short explanatory narrative for each of the emergency accesses shown in Drawing 2076 / TR2.47a & b is provided below in the following sections.

Access Point 1

2.1.7 As shown in the image below, this is an existing emergency access which the Applicant is intending to retain. This provides swift access to the north western boundary and eastern side of the B2190 immediately adjacent to the approach lights.

[1]International Civil Aviation Organization: Aerodrome Design Manual Part 6 - Frangibility 1st Edition - 2006
[2] International Civil Aviation Organization: Annex 14 - Volume 1 - Aerodromes - Aerodrome Design and Operations - 8th Edition, July 2018

Access Point 2

2.1.8 The masterplan removes the currently existing accesses onto Spitfire way in this area. It is considered beneficial to have an emergency access here for the purposes of responding to an incident between Emergency Access 1 and the Passenger entrance. The exact position of this gate will be determined as part of the operational and management plan and emergency response process developed by the airport.

Access Point 3

2.1.9 This provides access to Landside areas for airfield rescue and firefighting services responding to an incident to the North East of the site. This is the closest point between the fire station and boundary fence.

Access Point 4

2.1.10 This provides access to the Eastern approach to the site. The gate accesses onto agricultural land and is the quickest route to an incident occurring on the 28 Runway approach.

Access Point 5

2.1.11 This provides access to the highway network South and South East of the site and makes use of internal service roads to reach the fuel farm.

Access Point 6

2.1.12 The A299 has been upgraded to a dual carriageway preventing emergency response vehicles from 'turning right' (westwards) if exiting the site along its southern boundary. The image below shows the previous emergency access on the southern boundary and road restraint preventing vehicles turning westwards:

2.1.13 It would be possible to relocate this emergency access northwards along the B2190 if the current location onto the roundabout is unviable due to road safety concerns. Another possible location is shown below. This would make use of some existing hardstanding adjacent to the boundary fence. Ultimately the priority would be to provide a route for airfield emergency services to access an incident to the South of the site and to the 10 approach light areas.

2.1.14 The image below shows the existing emergency access onto the A299 and the central vehicle restraint barrier which prevents a right turn out of the site.

2.1.15 The final position of these gates will need to be determined as part of the airports overall emergency response procedures. If Kent County Council (KCC) or the emergency services have particular concerns about the locations, this will be discussed and amendments made.

Issued by

[redacted]..

Approved by

[redacted]........

Glyn Price

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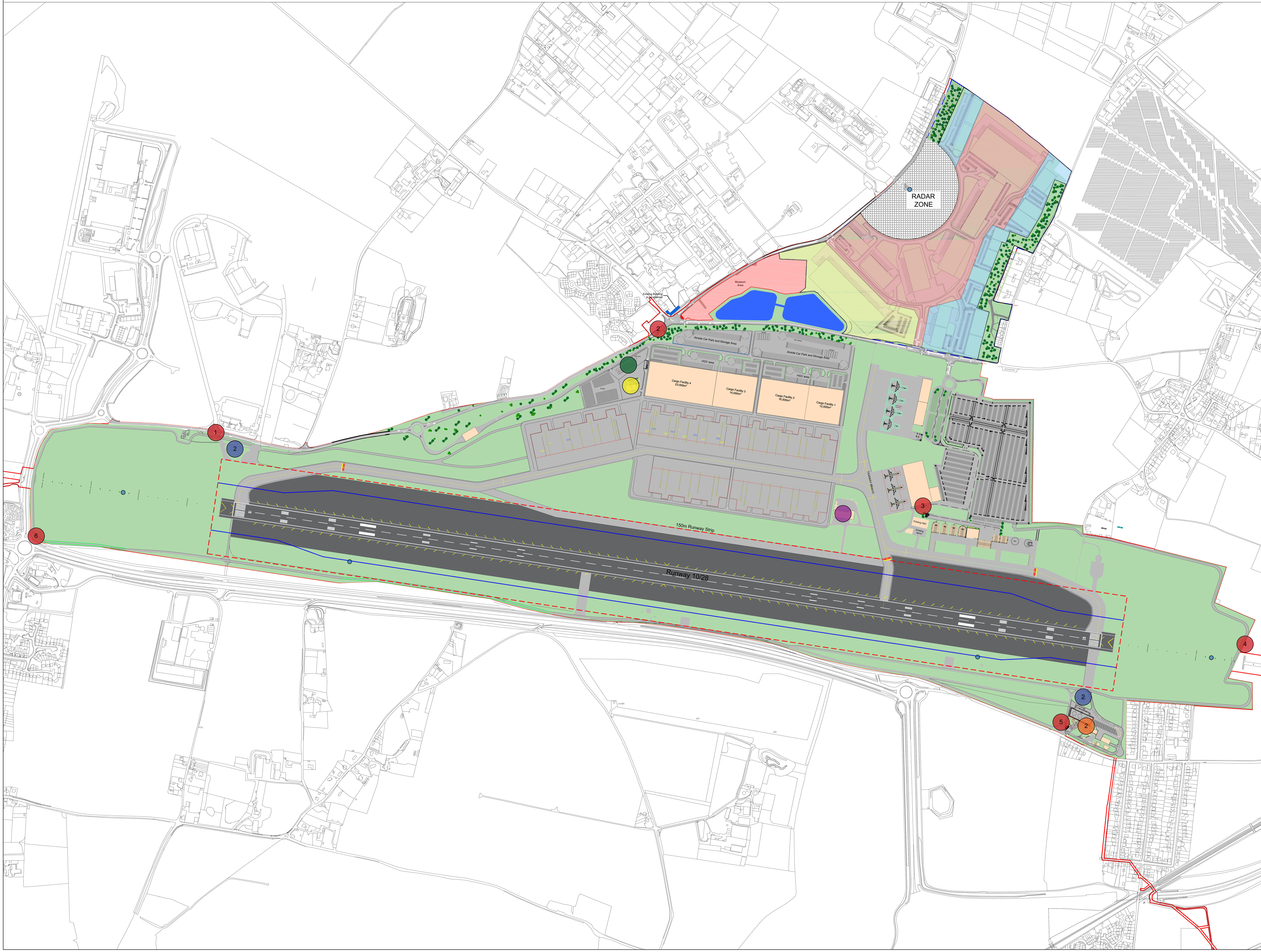
MANSTON AIRPORT DEVELOPMENT CONSENT ORDER
CRASH GATE LOCATION PLAN
REGULATION 5(2)(o)
THANET DISTRICT COUNCIL

RSP



KEY

- 1 EMERGENCY ACCESS
- BULK FUEL INSTALLATION
- EMERGENCY WATER SUPPLY
- FIRE STATION
- AIR TRAFFIC CONTROL
- EMERGENCY RENDEZVOUS POINT
- RUNWAY OBSERVATION POINT
- NAVIGATION AID

Notes

1. OS Data obtained from emapsite™ May 2017: © Crown copyright and database rights 2017 Ordnance Survey 0100031673

100m SCALE 1:5000

Rev	Description	By	Ckd	Apr	Date
P01	First Issue.	TAW	CJ	GD	23.02.18

Project MANSTON AIRPORT DEVELOPMENT CONSENT ORDER

Title CRASH GATE LOCATION LOCATION PLAN REGULATION 5(2)(o) THANET DISTRICT COUNCIL

Document Number	Revision
NK018417 - RPS-MSE-XX-DR-C-2076	P01
Project Number / Originator - Zone - Level - Type - Role - Drawing Number	

Application Number - TR02002

Scale	Sheet Size	Sheet No	Status
1:5000	A1	1 of 1	S. 56

Appendix ISH7 – 50

Technical note:

Passenger Parking Provision Technical Note

1. Introduction

1.1.1 At the Transport Hearing on 6th June the Examining Authority requested the following in relation to passenger parking assumptions set out in the Car Park Management Strategy (CPMS).

- Clarification in relation to apparent overprovisions in parking spaces considering number of passenger flights proposed – include a parking compliance strategy, and consideration of any implications for Compulsory Acquisition, including the possible use of this area as a construction compound.
- Set out details of passenger mode share assumptions applied and their alignment with those applied in the TA.

1.1.2 A parking model was developed to calculate the number of passenger parking spaces for Manston Airport which was based on passenger demand estimations and empirical evidence of passenger parking profiles from existing airports. Section 2 of the CPMS identified the following space provision based on the results of the parking model:

- 150 Short Stay "drop off" parking spaces;
- 1,665 longer term parking spaces; and
- 1,815 total parking spaces required.

1.1.3 This note considers the Examining Authority request for clarification by setting out the following;

- A comparison with the car park space provision required at the airport based on the mode share assumptions and targets set out in the TA and Travel Plan be used in the calculations set out in the CPMS; and
- Details regard the over provision, need for further car parking spaces that previously set out and other details about management.

2. Passenger Parking Assumptions

2.1 Overview

2.1.1 The methodology for the calculation of the passenger parking has been based on passenger demand derived from the anticipated passenger flights per day per carrier and the passenger loads per carrier, as set out in the TA and empirical evidence from other airports.

- Assumptions on passenger profiles – business long stay, business short stay, leisure long stay and leisure short stay derived from surveys of five airports as set out in the Civil Aviation Authority (CAA) Passenger Survey Report 2016[1].

[1] 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].

- Length of stay derived from the surveys of five airports set out in the CAA Passenger Survey Report 2016.
- Modal share derived from the surveys of five airports set out in the CAA Passenger Survey Report 2016.
- Estimations of drop off spaces based on observations at Leeds Bradford and Southampton Airports.

2.1.2 The methodology did not include the mode share assumptions included in the TA to estimate traffic generation.

2.1.3 The basis for the calculations is set out in **Appendix A**.

2.2 Passenger Parking based on Revised TA Modal Share

2.2.1 The parking model has been re-run based on the modal share assumptions and targets which have formed the basis for the transport assessment and the Travel Plan and the estimated vehicle occupancies.

2.2.2 The model results indicate the following parking provision requirement:

- 1,609 longer term parking spaces;
- 125 Short Stay "drop off" parking spaces, comprising:
  - 22 short stay parking spaces;
  - 88 car drop off/pick up spaces (based on passenger traffic generation figures); and
  - 15 taxi spaces (based on passenger traffic generation figures)
- 1,734 total parking spaces required.

2.2.3 This is 81 fewer spaces than that identified in in the CPMS (-4%) which is considered to be within a reasonable range.

2.3 Over Provision of Passenger Parking

2.3.1 The space identified for flexible overspill parking will be a construction compound during the construction phases as shown in the Master plan [APP- APP-079] and can only be used only after the works are complete in Phase 4 of the construction programme.

2.3.2 As set out in the CPMS, the space for "overflow parking" will ensure that there are no issues with overspill parking onto surrounding areas, which addresses concerns expressed by KCC regarding the risk of 'flyparking'. In addition, it will enable flexibility of size of spaces: blue badge parking and electric vehicle parking have larger dimensions than standard size spaces.

2.3.3 A large area of this space is now also been ear marked for hire car facilities onsite, which will again reduce the number of spaces in the overflow parking area. As an example, at Southend Airport there are two car parks related to car hire. One car park of around 130 parking spaces for hire cars returned cars, and another of around 50 for cars that are near the terminal ready to be picked up by passengers arriving.

2.3.5 As such it is considered that with numerous unknowns on the site between design of blue badge and electric spaces, hire car company's needs, nature and timing of flights and seasonality of arrivals and departures at the airport that a large over provision is needed to allow for a car park facility that accommodates for all needs in an efficient manner

Issued by

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....

Glyn Price

Approved by

[redacted]

Bev Coupe

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Appendix A
Parking Model Input Data

Year Y20

Total Movements

	Carrier	Flights/day	Flights/year	Pax/Flight	Pax/day	Passengers/year	Mean Distance (km)
KLM	KLM	4	1,456	52	207	75,712	259
Cha	Charter market	0	178	135	66	23,980	1,315
Blu	Blue Air	1	237	170	110	40,286	1,984
Cru	Cruise flights (and Florida)	0	154	198	84	30,481	7,105
Eas	Easyjet (ex Southend)	-	-	135	-	-	846
Eas	Easyjet long haul	-	-	270	-	-	7,248
Rya	Ryan Air	20	7,274	170	3,390	1,237,294	1,133
Ira	Iran Air	-	-	266	-	-	4,306
		25	**9,298**		**3,856.9**	**1,407,753**	
		774.86					

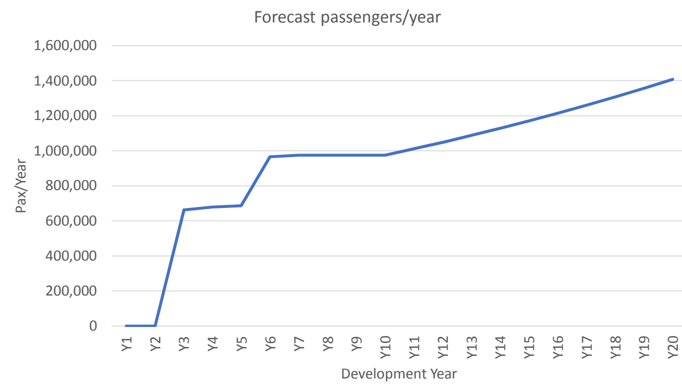
Boarders

	Carrier	Flights/day	Flights/year	Pax/Flight	Pax/day	Passengers/year	Mean Distance (km)
KLM	KLM	1.99	728.00	52	103.72	37,856.00	259
Cha	Charter market	0.24	88.81	135	32.85	11,989.98	1,315
Blu	Blue Air	0.32	118.42	170	55.19	20,143.16	1,984
Cru	Cruise flights (and Florida)	0.21	76.97	198	41.76	15,240.60	7,105
Eas	Easyjet (ex Southend)	-	-	135	-	-	846
Eas	Easyjet long haul	-	-	270	-	-	7,248
Rya	Ryan Air	9.96	3,636.96	170	1,694.92	618,646.93	1,133
Ira	Iran Air	-	-	266	-	-	4,306
		13	**4,649**		**1,928.4**	**703,877**	

Terminating

	Carrier	Flights/day	Flights/year	Pax/Flight	Pax/day	Passengers/year	Mean Distance (km)
KLM	KLM	1.99	728.00	52	103.72	37,856.00	259
Cha	Charter market	0.24	88.81	135	32.85	11,989.98	1,315
Blu	Blue Air	0.32	118.42	170	55.19	20,143.16	1,984
Cru	Cruise flights (and Florida)	0.21	76.97	198	41.76	15,240.60	7,105
Eas	Easyjet (ex Southend)	-	-	135	-	-	846
Eas	Easyjet long haul	-	-	270	-	-	7,248
Rya	Ryan Air	9.96	3,636.96	170	1,694.92	618,646.93	1,133
Ira	Iran Air	-	-	266	-	-	4,306
		13	**4,649**		**1,928.4**	**703,877**	

Y1	0
Y2	0
Y3	662767.6
Y4	679867.6
Y5	686671.6
Y6	965295.4
Y7	975591.4
Y8	975591.4
Y9	975591.4
Y10	975591.4
Y11	1011587
Y12	1049022
Y13	1087954
Y14	1128444
Y15	1170553
Y16	1214347
Y17	1259892
Y18	1307259
Y19	1356521
Y20	1407753



	International Flights						Domestic Flights					
	UK Business	UK Leisure	Foreign Business	Foreign Leisure	Charter Business	Charter Leisure	UK Business	UK Leisure	Foreign Business	Foreign Leisure	All	
Birmingham	6	9.9	3.4	8.9	6.5	8.7	2	5.2	1.2	4.9	**8.1**	*3*
E Midlands	3.8	8.4	5.5	8.1		8.4	1.9	4.9	7.6	3.8	**7.7**	*4*
Gatwick	4.1	8	5.1	7.3	6.4	8.1	2.7	6.6	2.7	8	**7.3**	*5*
Heathrow	5.9	12.1	5.5	10.6	6.5	7.6	3.1	4.5	6.1	8.3	**9.6**	*1*
Liverpool	2.7	6.9	4.4	5.7		7.8	2	4.4	10.5	4.5	**5.9**	*7*
London City	2.4	6.8	2.5	5.2			2.3	3.7	3.7	9.9	**4**	*9*
Luton	3.3	7.6	6.6	6.5	4	8.2	1.7	4	0.8	3.5	**6.8**	*6*
Manchester	5.8	9.8	5.2	10.3	5.7	8.6	3.7	8.1	10.4	7.7	**8.9**	*2*
Stansted	3.3	6.8	4	5.8		8.2	1.9	4.5	3.1	3.9	**5.8**	*8*
Average	3.275	7.425	5.125	6.525	4	8.15	1.875	4.45	5.5	3.925	6.55	

Short Stay Proportion (<1 day)

					Total Volume (000's)		Passenger Split		Short Stay	
	Internationa	International Le	UK Business	UK Leisure	Bus	Lei	Bus	Lei	Bus	Lei
Luton	881	8162	328	607	1209	8769	**12%**	**88%**	**24%**	**1%**
short stay (%)	*15%*	*1%*	*49%*	*4%*						
East Midlands	100	3077	135	262	235	3339	**7%**	**93%**	**32%**	**1%**
short stay (%)	*7%*	*0%*	*51%*	*3%*						
Stansted	1389	11561	603	1000	1992	12561	**14%**	**86%**	**27%**	**2%**
short stay (%)	*17%*	*2%*	*51%*	*7%*						
Liverpool	118	2317	140	742	258	3059	**8%**	**92%**	**36%**	**2%**
short stay (%)	*21%*	*1%*	*49%*	*8%*						
Heathrow	5591	18153	1214	719	6805	18872	**27%**	**73%**	**26%**	**1%**
short stay (%)	*21%*	*1%*	*49%*	*8%*						

Suggested s	**Luton**	**Liverpool**	**E Midlands**	**Stansted**	**Heathrow**	**Average**
BS	3%	3%	2%	4%	7%	3%
BL	9%	5%	4%	10%	20%	7%
LS	1%	2%	1%	2%	1%	1%
LL	87%	90%	93%	84%	73%	89%
	100%	100%	100%	100%	100%	

Birmingham					
	international		domestic		
	Business	Leisure	Business	Leisure	All
up to 12 hours	1.0%	0.0%	12.6%	2.1%	1.8%
12 hours to 1 day	9.5%	0.4%	32.4%	4.1%	4.9%
2	21.1%	1.6%	20.2%	14.1%	7.1%
3	19.3%	5.2%	14.7%	15.9%	8.8%
4	8.5%	8.6%	7.3%	17.1%	10.1%
5	7.7%	6.5%	7.2%	9.6%	7.4%
6	1.4%	2.9%	0.4%	2.8%	2.4%
7	9.4%	26.8%	4.0%	21.3%	20.5%
14	6.0%	29.9%	0.7%	8.9%	23.0%
21	12.3%	7.6%	0.4%	1.3%	6.7%
28	1.7%	4.4%		0.6%	3.3%
0	2.1%	6.1%		2.2%	4.1%
	100.0%	**100.0%**	**99.9%**	**100.0%**	**100.1%**
Average (days)	6.4	9.9	2.0	5.3	8.3

East midlands					
	international		domestic		
	Business	Leisure	Business	Leisure	All
up to 12 h	0.6%	0.0%	25.8%	0.2%	1.2%
12 hours t	6.7%	0.4%	24.9%	3.0%	1.9%
2	22.5%	1.7%	21.2%	4.6%	3.5%
3	32.4%	4.3%	9.7%	23.6%	6.5%
4	13.6%	8.5%	8.2%	20.0%	9.1%
5	11.2%	7.5%	4.2%	15.1%	7.7%
6	0.0%	2.5%	0.6%	3.1%	2.3%
7	7.9%	34.7%	3.5%	17.3%	32.4%
14	1.3%	32.1%	0.8%	12.1%	28.0%
21	0.0%	3.7%	0.0%	0.5%	3.3%
28	1.6%	2.1%	1.2%	0.2%	2.0%
0	2.1%	2.5%		0.3%	2.0%
	99.9%	**100.0%**	**100.1%**	**100.0%**	**99.9%**
Average (d	3.7	9.3	2.0	5.6	8.6

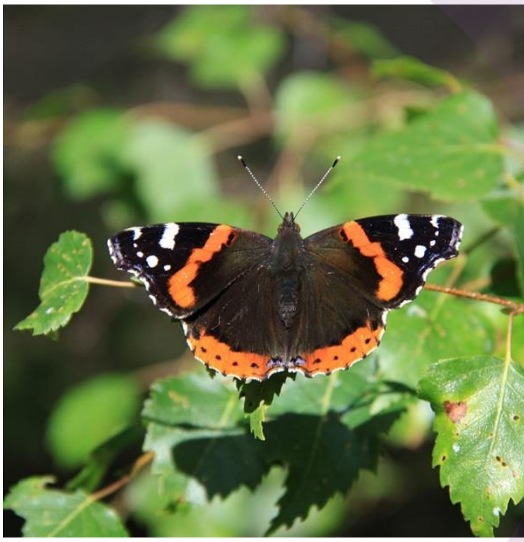
Heathrow					
	international		domestic		
	Business	Leisure	Business	Leisure	All
up to 12 hours	3.7%	0.1%	20.2%	6.8%	2.0%
12 hours to 1 day	4.9%	0.0%	18.8%	1.3%	1.7%
2	16.3%	1.1%	24.3%	12.6%	6.0%
3	15.0%	4.1%	14.4%	25.7%	7.2%
4	16.0%	8.4%	8.0%	18.2%	11.4%
5	10.4%	6.2%	4.2%	10.5%	8.4%
6	3.5%	2.3%	1.6%	3.6%	3.2%
7	11.5%	14.0%	2.5%	9.8%	14.5%
14	8.7%	33.4%	1.4%	7.8%	24.5%
21	3.6%	13.2%	0.3%	1.7%	9.1%
28	2.8%	7.5%	0.3%	0.3%	5.1%
0	3.5%	9.7%	4.2%	1.7%	6.9%
	99.9%	**100.0%**	**100.2%**	**100.0%**	**100.0%**
Average (days)	5.7	11.5	2.1	4.7	9.2

Appendix ISH7 – 52

RiverOak Strategic Partners Limited

Manston Airport DCO

TA Appendix N – Car Park Management Strategy



Wood Environment & Infrastructure Solutions UK Limited – June 2019

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Contents

1.	**Introduction**	**4**
1.2	Overview	4
1.3	Structure of the Car Park Management Strategy	5
2.	**Passenger Car Parking**	**6**
2.2	Demand	6
2.3	Masterplan Passenger Parking Allowances	10
2.4	Blue Badge and Electric Vehicle Spaces	10
	Blue Badge/Disabled Parking	10
	Electric Vehicle Parking	11
3.	**Airport Staff Car Parking (Excluding Northern Grass Area)**	**13**
3.1	Staff Car Parking	13
3.2	Masterplan Staff Parking Allowance	15
3.3	Staff Car Park Management	15
3.4	HGV Parking at the Cargo Terminal	16
4.	**Northern Grass Area Car Parking**	**17**
5.	**Car Park Strategy Summary**	**23**

Table 2.1	User Profile – CAA Survey 2016	7
Table 2.2	Modal Share Assumptions	8
Table 3.1	Staff Number and Shift Patterns	13
Table 4.1	B1 Parking Standards from Kent and Medway SPG 4and the emerging Thanet Local Plan	18
Table 4.2	B1 parking requirements from local authority parking standards	19
Table 4.3	B8 Parking Standards from Kent and Medway (2006) and the Emerging Thanet Local Plan	19
Table 4.2	B8 parking requirements from local authority parking standards	20
Table 4.5	Impaired Mobility Parking Standards *Supplementary Planning Guidance (SPG) 4*[7] (2006)	20
Table 4.6	Impaired Mobility Parking Provision from Kent and Medway (2006) Guidance.	21

Figure 2.1	CAA 2014 Survey – Modal Share	7
Figure 2.2	Passengers per Year vs Total Parking Space – UK Airports Comparison	9
Figure 3.1	Parking accumulation – All staff using the passenger terminal access	14
Figure 3.2	Parking accumulation – All staff using the cargo access	15
Figure 3.3	On-street parking assessment area – local highway network	15

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.

2.2 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:

- Business long stay (BL);

[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 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.

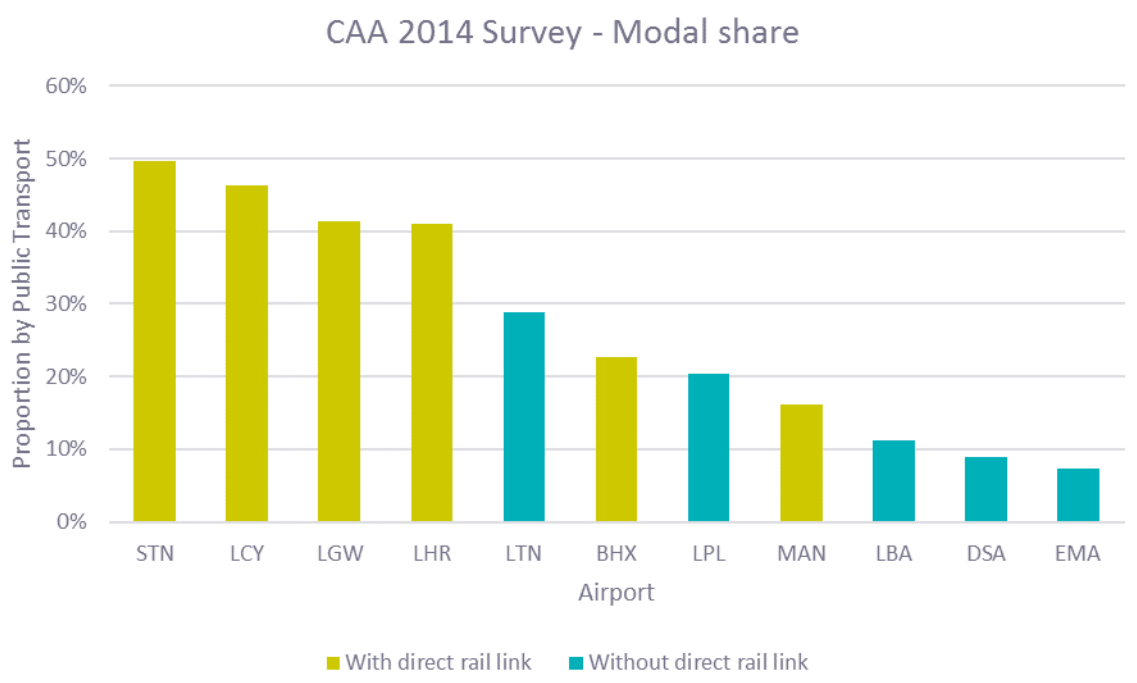
2.2.9 The average length of stay for business passengers is assumed to be 1.9 days. For leisure passengers, the average length of stay is assumed to be 4.5 days. Short stay passengers are assumed to have a trip length of 1 day.

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)

<u>Where:</u>

LOSB = Average Length of stay (business)

CB = Car modal share (business)

YB = daily demand (business)

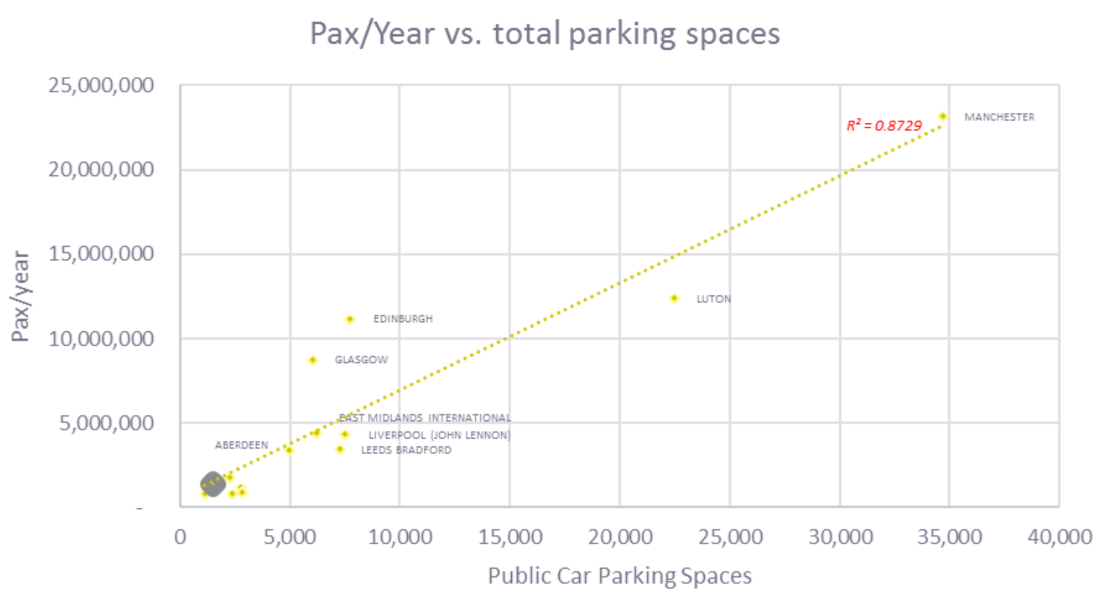
LOSL = Average Length of stay (leisure)

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.

2.4 Blue Badge and Electric Vehicle Spaces

2.4.1 Provision will be made for Blue Badge and Electric Vehicle parking.

Blue Badge/Disabled Parking

2.4.2 The quantum of Blue Badge car parking will be based on a review of provision and take-up at other comparable airports, and the KCC *Supplementary Planning Guidance SPG 4 Kent Vehicle Parking Standards,* July 2006, and the British Parking Association (BPA) recommendations of six spaces plus 3% of total car parking for car parks over 1,000 spaces.

2.4.3 The design and location of the spaces will be based on the following principles:

- Parking bays for the mobility impaired will be conveniently located and clearly signed. They will be located as close as possible to the main entrance.

- Access between the car parking spaces and the entrance to buildings will be where possible as flat as possible.
- Parking bays will be 4.8m long (plus a 1.2m safety zone at the rear) × 3.6m wide to accommodate transfer from the car to a wheelchair, noting that space can be saved by combining spaces in pairs of 4.8m × 2.4m with a common transfer zone of 1.2m.
- The management of the disabled park bay will be monitored by the car park management company employed once services start from the development.

Electric Vehicle Parking

2.4.4 The last few years has seen rapid growth in electric vehicles (EV) in the UK with new registrations of plug-in cars increasing from 3,500 in 2013 to more than 214,000 by the end of May 2019, with an average of 5,000 per month during 2018.

2.4.5 An electric car can take anything from half an hour to up to 12 hours to charge. This all depends on how big the battery is as the type of charging point and its speed of charging. The majority of charging takes place at home and is done overnight, but there is a need for supplementary charging during the daytime, such as at workplaces, town centres, train stations and at service stations.

2.4.6 Electric car charging infrastructure is still an evolving technology, but many train stations and airports have already started to provide spaces.

- Birmingham Airport - EV charging points that are suitable for many types of EV are located within the Premium Set Down car park and are available to use with the parking charge discounted to £2 for the first hour (charging takes about 20 minutes). Thereafter normal charges apply. The Airport also offers an Airparks Drop & Go with electric vehicle charge for those needing to park for longer
- Luton Airport has 10 charging point spaces in its multi-storey car park which is free to use but normal parking charges apply (£8 for up to 30 minutes to £49 for 5 – 9 hours). It also offers an Airparks Drop & Go with electric vehicle charge for those needing to park for longer.
- Bristol Airport - two car electric charging points are situated in the Short Stay & Pick Up car park.

2.4.7 Allocation of EV spaces will be in short stay parking areas and will be available for the public and also for a valet parking 'drop and go' package, whereby an EV is dropped off, and it is charged before being parked in a long stay parking space.

2.4.8 At this stage it is proposed that 10% of the short stay spaces have "active provision" -in the form of a rapid charging point enabling an EV to be charged in less than one hour. It is anticipated that more of the car park will be provided with "passive provision", whereby the car park is built with the relevant ducting and cables installed in the ground below the surface so that should there be a need for further spaces, these can be provided with the minimum of disruption. This will be defined during detailed design.

2.4.9 The principles for the design will be as follows.

- Where possible the least amount of infrastructure to serve the maximum number of vehicles will be provided. At a minimum, a charging point should serve two vehicles, but where four spaces meet in two rows of two one post can serve four cars.
- Charging points will be located in locations where they are prominent.

- Sufficient space will be given in spaces to allow for differing cars with differing car charging point locations to be able to efficiently use the charging point. Cable lengths will be long to allow for numerous vehicle types to use the facilities.
- The area of charging points will be designed to avoid main pedestrian routes as to avoid the trip hazards these cables can present and relevant waning signage will be installed at all spaces.
- All signage will include the DfT approved signage for EV charging points, car park signage will be installed to direct users to these spaces.
- EV charging spaces will be surfaced with a green surface to make these spaces more visible.

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 jobs 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

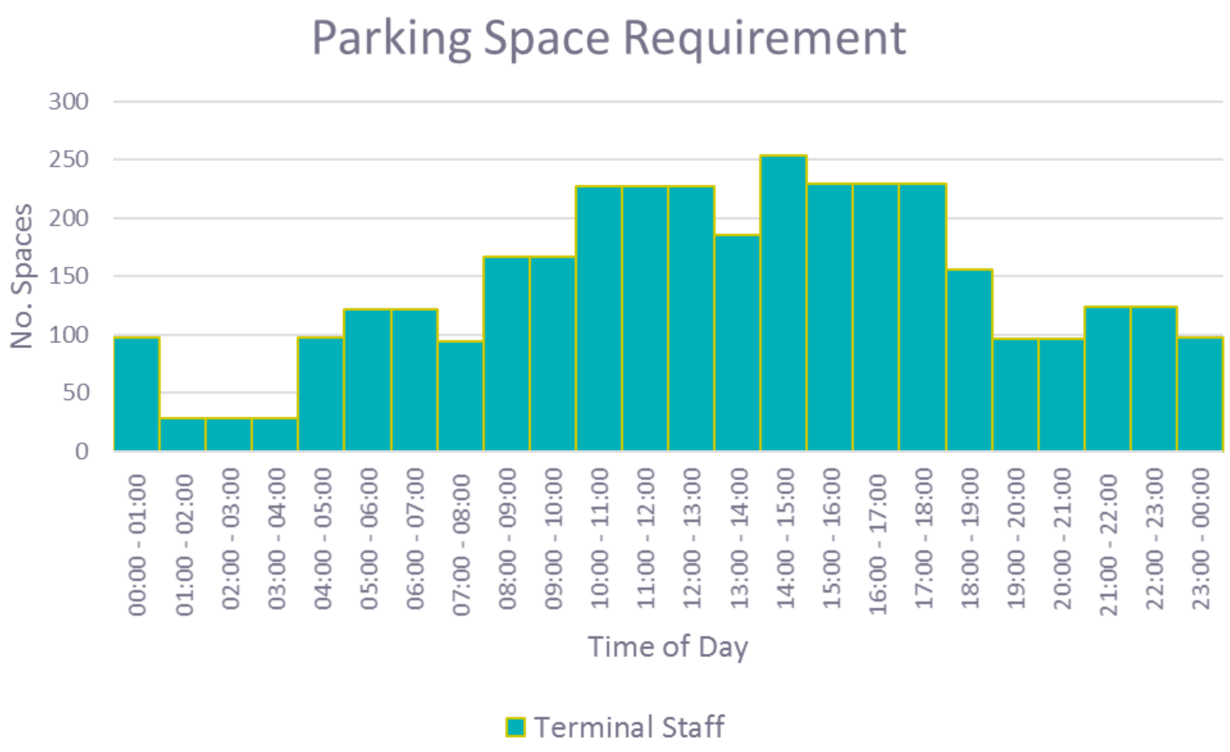
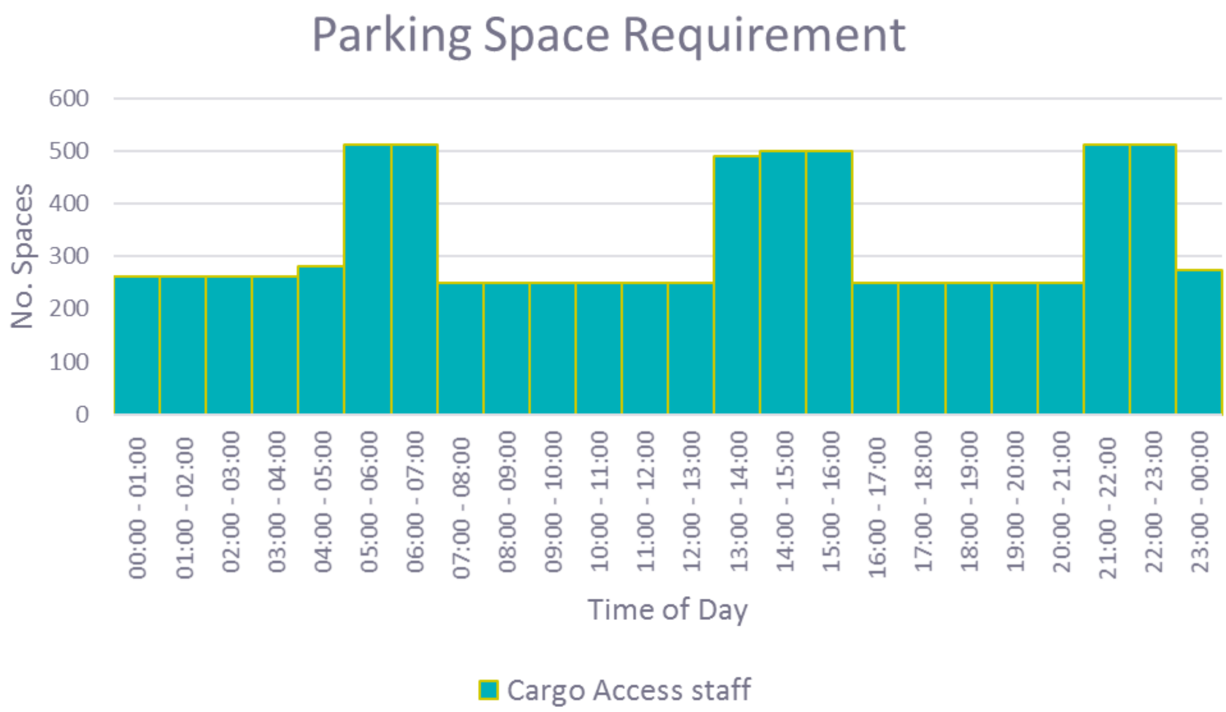


Figure 3.2 Parking accumulation – All staff using the cargo access



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 facilities.

3.3.4 This results in 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.

3.3.5 As with the short stay car parking at the passenger terminal it is proposed that each of the staff car parks proposed on the Proposed Development will include:

- EV parking spaces based on the same principals set out in Section 2.4 above.
- Blue Badge parking spaces in accordance with KCC standards.

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 Policy 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 practice 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.

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[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 500m^2	1 space per 20sqm	1 space per 20sqm
Offices 500m^2 to 2,500m^2	1 space per 25sqm	1 space per 25sqm
Offices over 2,500m^2	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.
Car parks with 40 to 200 spaces	4 designated spaces or 5% of the total capacity, whichever is greater

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 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 Area, 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 19	87	5
Unit 20	96	4
Unit 21	69	4

4.1.17 As with the short stay car parking at the passenger terminal it is proposed that each of the staff car parks proposed on the Proposed Development will include for 10% electric charging parking spaces. The same principles set out above in section 2.4 apply.

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;

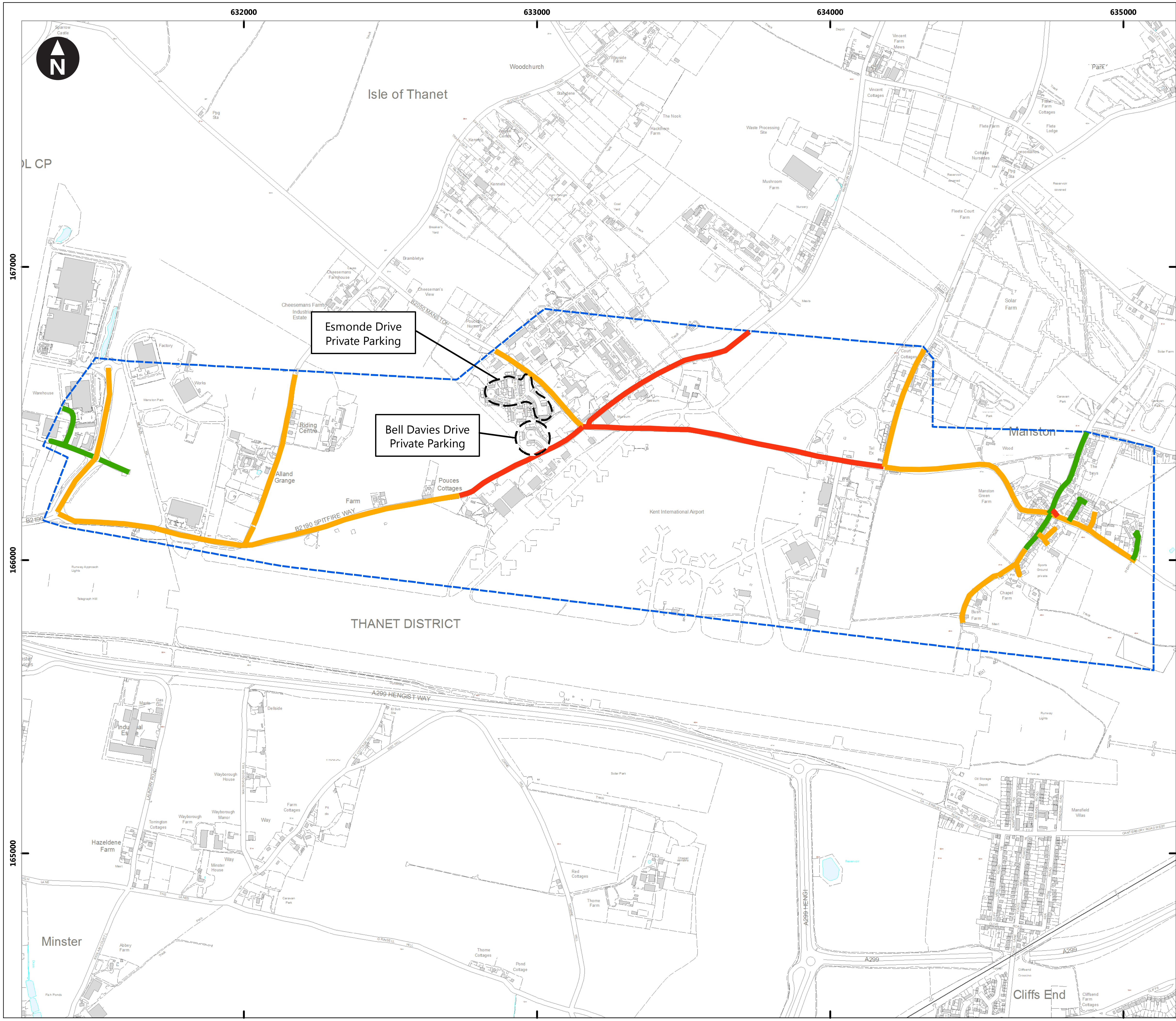
- 563 car park spaces accessed via the Cargo Access; and
- 729 car park spaces accessed via the Passenger Terminal Access.

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 The report also sets out details regarding the provision of a sufficient number of EV charging spaces and blue badge/disabled spaces providing some guiding principles for these areas when s for these areas when detailed design is proposed.

5.1.7 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.

Figures



Key

- Assessment area
- On street parking available
- On street parking deemed unsuitable
- Parking restricted

0 200 400 600 m

Scale at A3: 1:12,500

Client

RSP

Manston Airport DCO
Appendix N Car Park Management Strategy

Figure 3.3
On-street parking assessment area - local highway network

June 2019

wood.

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