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Havant Borough Council

Mainland Transport Assessment Addendum

Southleigh Development Impact – Part 2

For:

Havant BOROUGH COUNCIL

Project Number: **13265**

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1.0 EXECUTIVE SUMMARY

1.1. Havant Borough Council (HBC) commissioned CampbellReith (CR) to provide an Addendum to the Havant Borough Council Local Plan 'Mainland' Transport Assessment (HBCLP TA, 2019). This was to assess, in greater detail, the access requirements associated with a significant land allocation for up to 2,100 dwellings, known as the Southleigh strategic development site. Given that the strategic level modelling used for the original TA was unable to determine conclusively whether a direct access onto the A27 from the Strategic Site was needed, this further work, at a local level, has been requested to provide a definitive steer regarding the need for a new link for direct access to/from the A27. If and when a need has been established, further work would be undertaken to understand the direct impact on the local road network.

1.2. The work in Part 1 of the Addendum has applied the principles established through the strategic modelling (using the Sub Regional Transport Model (SRTM)), but created a more detailed, local road network model to undertake the necessary individual junction analysis in order to understand the direct transport implications of the Southleigh strategic development site.

1.3. Part 1 concluded that a new link road to form a direct connection to the A27 and some improvement measures at the individual junctions on the local network surrounding the site are likely to be required to prevent roads and junctions surrounding the Southleigh development site exceeding their operational capacity and blocking the upstream and downstream road network.

1.4. This Report forms Part 2 of the Addendum and looks at the potential form and alignment of a direct link, and its effectiveness in addressing highways impacts both for the duration of the Local Plan as well as the impact of the full Southleigh development of 2,100 units. It provides the high level information required to inform the Local Plan without providing the development specific, detailed analysis that would be expected as part of a development proposal led Transport Assessment.

1.5. All information in the HBCLP TA is relevant and still applies unless specifically updated in this document. The HBCLP TA contains all necessary background information in relation to the wider network, and so it has not been repeated in this Addendum. This report (Parts 1 and 2), and the original HBCLP TA should be read together; however where there are contradictions (through update, extension or clarification) then this document should be taken as the latest version.

2.0 INTRODUCTION

2.1. Havant Borough Council (HBC) have commissioned CampbellReith (CR) to provide an Addendum to the Havant Borough Council Local Plan 'Mainland' Transport Assessment (HBCLP TA). This is to assess, in greater detail, the access requirements associated with a significant land allocation for up to 2,100 dwellings, known as the Southleigh strategic development site, and whether a dedicated access onto the A27 is required from the site.

2.2. The Addendum consist of two parts, Part 1 which was completed in July 2020 looked at the impact of the proposed Southleigh development on the local road network. The primary focus of the Addendum (Part 1) was to understand the existing and future year scenarios of the local road network surrounding the site and the impact of the previously identified Local Plan development.

2.3. The results suggested that a number of the existing junctions in the vicinity of the Southleigh development site are either currently experiencing congestion or will become congested by the end of the Local Plan assessment period. Below is the list of junctions in the vicinity of the Southleigh development site which are considered likely to require attention:

- Southleigh Rd/Emsworth Rd/Pook Lane;
- Warblington Level Crossing/ Southleigh Rd;
- A27 on/off Slip/Emsworth Rd Roundabout;
- A27/Havant Rd/ Church Lane Roundabout;
- North Street/A259/High Street Roundabout;
- Horndean Rd/ New Brighton Rd;
- Havant Road/Selangor Rd;
- Barton Rd/ Eastleigh Rd;
- Southleigh Rd/ Eastleigh Rd;
- Bartons Road / Horndean Road / Emsworth Common Road;
- Horndean Road / Southleigh Road;

2.4. Part 1 of the HBCLP TAA concluded that the existing road network is unlikely to be able provide the necessary additional capacity that would be required to facilitate the proposed 2,100 additional homes and community facilities to be provided within the Southleigh development area.

2.5. Given the significant stress placed upon the existing road network and with a number of the junctions operating significantly over capacity, a strategic link with the A27 was considered and tested to understand the possible opportunities and constraints. While it is accepted that individual junction mitigation may generate some, limited increased capacity, the significant volume of traffic on the local network would inevitably create a sensitive network that has the potential to quickly become congested during peak times without any alternative route which could help re-distribute the traffic.

2.6. While the potential of a link has been discussed previously, this report (Part 2 of the HBCLP TAA) looks to assess the direct impact of any link, as well as provide indication of its likely form – taking into account previous studies of the area – in order to inform the Local Plan process.

3.0 THE ADDENDUM – PART 2

3.1. This document forms the second part of an Addendum to the original 'Mainland' Transport Assessment (HBCLP TA) published the Council in February 2019. All information in the HBCLP TA is relevant and still applies unless specifically updated in this document. The HBCLP TA contains all necessary background information in relation to the wider network, and so it has not been repeated in this Addendum. This Addendum (Parts 1 and 2) and the original HBCLP TA should be read together; however where the two contradict (through update, extension or clarification) then this document should be taken as the latest version.

Rationale for the Addendum

3.2. As a recap and as previously stated in the TA Addendum Part 1 of provides a relevant, robust evidence base for the suggested Local Plan development allocations across the Borough, it does not provide a detailed assessment of individual sites.

3.3. With specific regard to the proposed Southleigh development site allocation, the summary included within the HBCLP TA, at paragraph 6.3.22, does not clearly recommend a preferred approach:

"In summary, whilst the DS (Do Something) scenario shows that the mitigation measure tested within this TA for the A27/Emsworth Road junction will address capacity issues associated with the Local Plan allocations as a whole, the full impact of the Southleigh strategic site requires additional assessment, particularly in respect of its impacts on the town centre, Southleigh Road, and the surrounding local road network. This may require a revised junction arrangement allowing a direct link from the Southleigh site onto the A27 to be considered further, the Borough Council should consider safeguarding land that could deliver junction options as set out on the 'Southleigh – A27 Junction report' that will be published separately to this Transport Assessment."

3.4. The purpose of Part 2 of this Addendum is therefore to consider, using more detailed local modelling tools, whether a direct access onto the A27 would be effective in reducing / addressing / avoiding / mitigating (not sure which word is appropriate) significant highways impacts on the network surrounding the site, and to consider the appropriate form of such a link, taking into account previous statutory comments and Feasibility Studies.

Application of the Strategic Transport Model

3.5. As detailed within Section 4 of the HBCLP TA, a Sub-Regional Transport Model (SRTM) was utilised to model the proposed local plan development to help identify the likely, future transport implications and test appropriate mitigation interventions.

3.6. Both parts of the Addendum build on the strategic work undertaken as part of the HBCLP TA. The SRTM outputs in terms of likely volumes of traffic on the local and surrounding network for the future year 2036, to provide a level of consistency across the Transport Assessment and Addendum(s).

3.7. As part of this work, a manual adjustment in terms of likely distribution has been applied to the SRTM outputs to take into account the impact of any new link. The adjustment is discussed later in this Report, and uses the Census information as a base to understand likely key destinations in terms of arrivals and departures during peak periods.

Assessment Approach

3.8. As suggested within Part 1 of the TA Addendum, a genuine need for a new link to be considered (as a result of the proposed Local Plan development and background traffic growth) has been established. This Addendum (Part 2) seeks to understand the impact of local trips being redistributed along the new direct link to the A27, and whether this can be safely accommodated, through the testing of new link options.

3.9. It is acknowledged that previous work on this has been undertaken (some of which is detailed below) and any future scheme development will need to take into account potential issues surrounding land ownership, highway design, flood risk and other environmental matters to ensure that it could be deliverable. The results of testing the effectiveness of a new direct link to the A27 are presented later in this report.

Southleigh - A27 Junction: Previous Work

3.10. While a need for a new link has been established through the TA Addendum Part 1, the form and design of any link requires careful consideration to ensure deliverability, cost efficiency and benefit in terms of future highway capacity. In August 2018, a Feasibility Study was undertaken regarding the Southleigh – A27 junction, and what form of link or junction could be accommodated.

3.11. The purpose of the Southleigh – A27 Junction report was to consider potential options for connecting the Southleigh development to the strategic road network in a manner that would have a detrimental impact on the local road network.

3.12. The Report concluded that it had two preferred options, which were discussed with Highways England (who remain responsible for the operation of the A27). These Options – Option 1B and Option 4D – would therefore be suitable for further investigation.

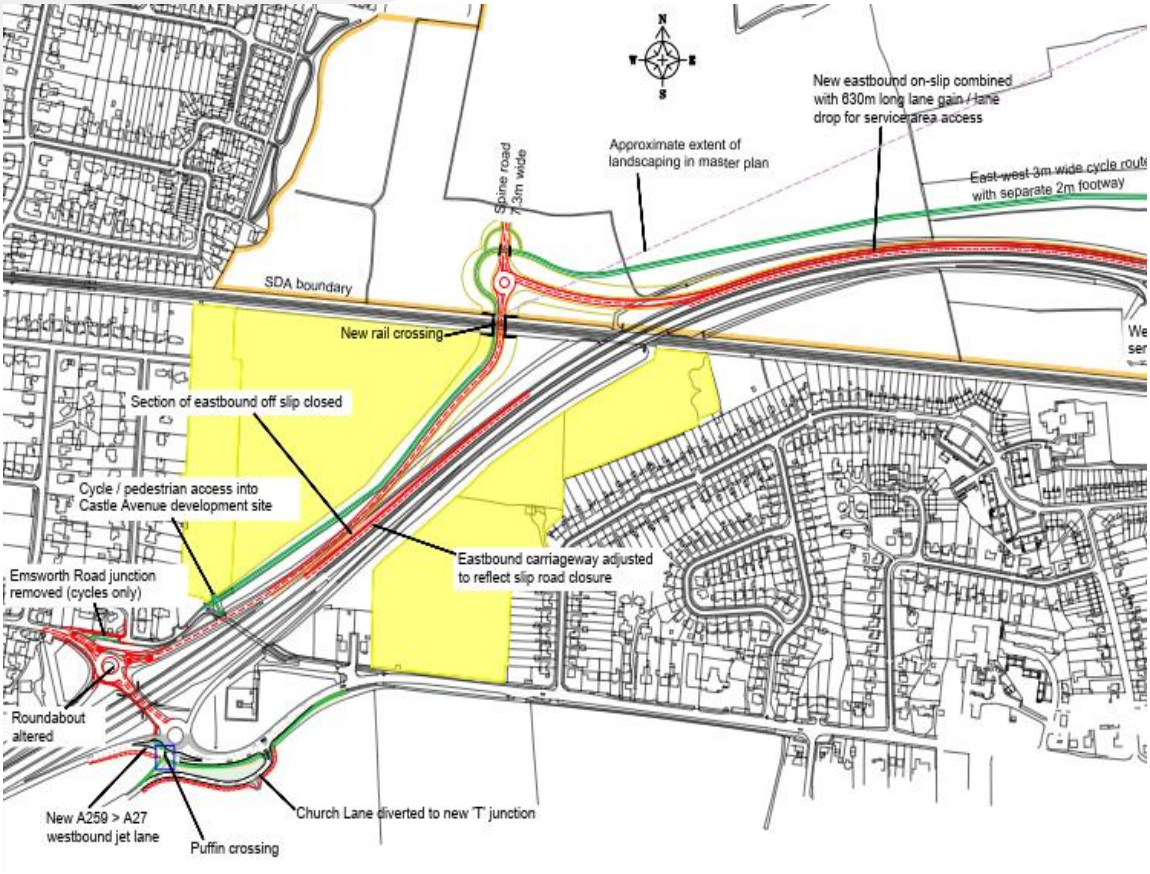
3.13. Of the two preferred options identified, it was evident that there was a significant cost difference between 1B and 4D mainly due to the introduction of a new, grade separated junction over the A27 to the southeast of the Southleigh development site. Notwithstanding concerns regarding the impact on the existing service area and deliverability, the cost implications of the more extensive option 4D had the potential to cause viability issues at Southleigh.

3.14. The decision was therefore taken that in the first instance Option 1B would be considered and assessed and where deemed necessary amended, to understand if it could provide the necessary capacity to facilitate the Southleigh development site.

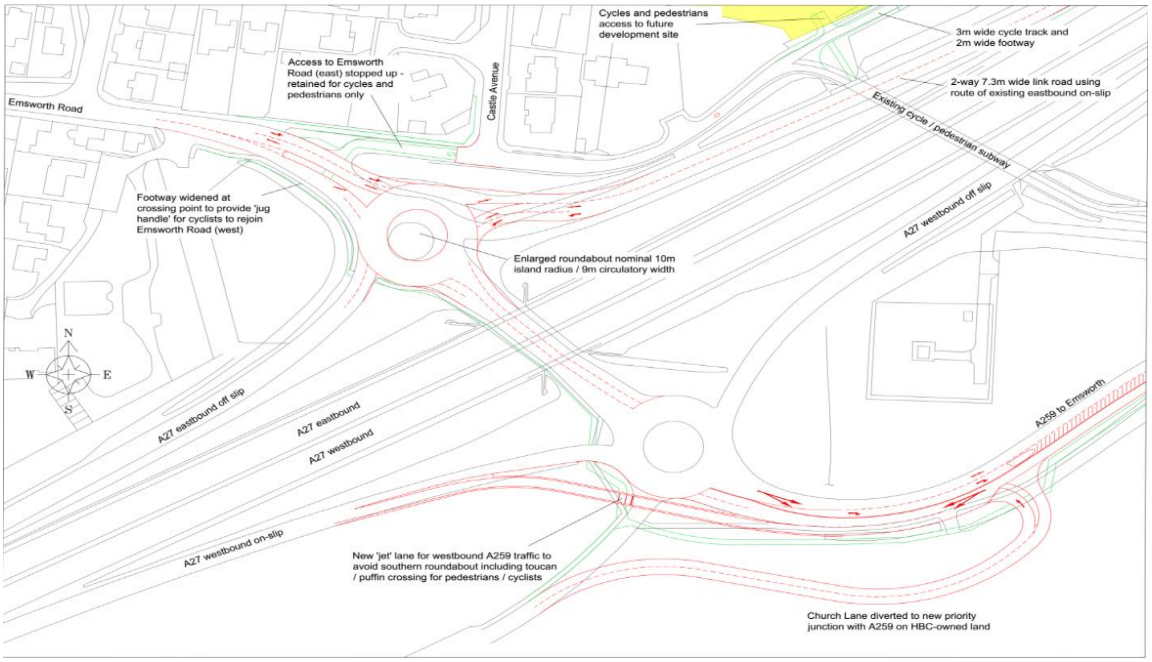
Option 1B: Most moves at Warblington

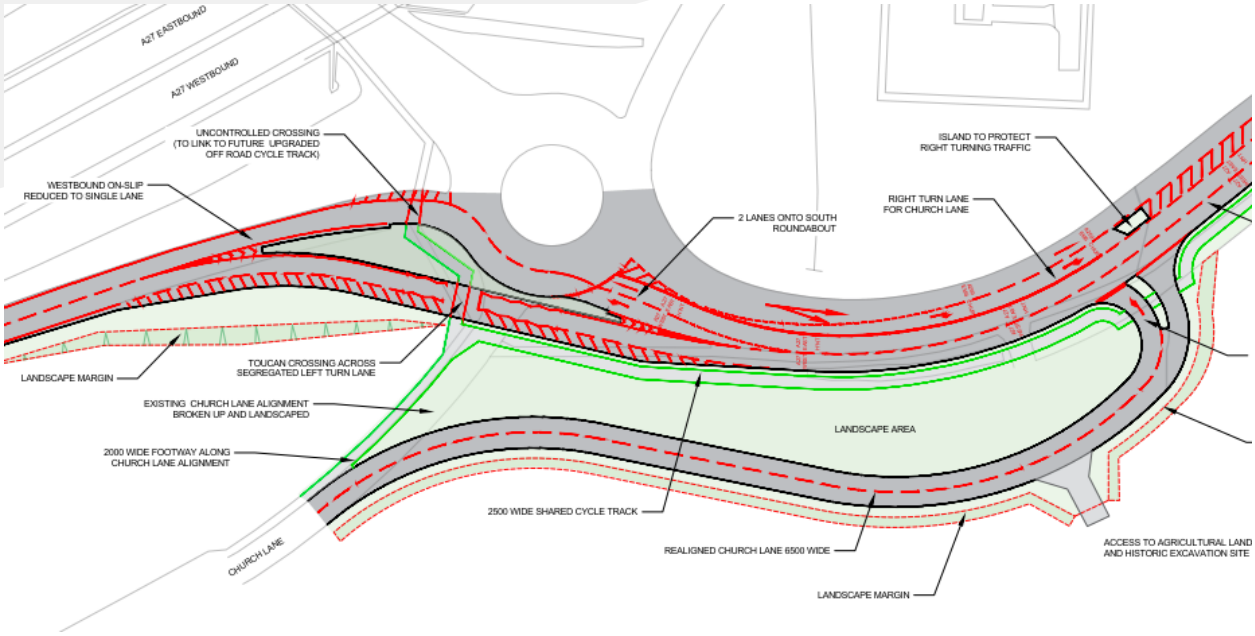
3.15. Option 1B uses the existing Warblington interchange as the main connection point between the new Southleigh site and its spine road and the A27. Only the arrangements for the eastbound on-slip are significantly changed.

Warblington interchange proposed option 1B



Warblington interchange proposed option 1B – further detail on the potential jet lane arrangement





3.16. As part of any future development a spine road serving Southleigh will be required as a link between the A27 and Southleigh Road itself. While the detail of this remains a master planning issue, for the purposes of the report it is assumed that traffic from the surrounding road network would use the spine road as a route to gain access to the A27 in preference to other routes including those through Emsworth (B2148) and central Havant (B2149).

3.17. The design of the spine road will therefore need to reflect its use as part of a longer route, probably replacing the lower end of the current B2148 and being ultimately designated as such. With this option it is expected that:

- Traffic from eastern areas of Havant with destinations to Chichester etc. use Bartons Road to access the new link;
- Traffic from Horndean / Rowlands Castle and the surrounding rural to be attracted away from the 'back route' via Funtington, especially when the A27 is not congested at Chichester;
- Traffic from Rowlands Castle to use the new link instead of the B2149 through Havant town centre, reducing traffic and improving air quality on the latter route;
- Traffic from Westbourne /north Emsworth to use this route to access the A27 in preference to travelling via Emsworth and the A259;
- Traffic flow in the lower section of the B2148 (North Street) to be significantly lower than at present as traffic diverts from the current B2148 onto the new link road;
- With the benefit of a TRO, heavy goods traffic through central Havant on the B2149 to be re-routed to access the New Lane industrial zone via Bartons Road and the link road onto the A27 - this would benefit air quality and reduce traffic flow through Park Road North and Park Road South;
- The new road layout will offer an alternative route across the existing railway line, instead of all traffic having to use the Southleigh Road level crossing, which can cause queuing during certain times of the day.

The HBCLP Transport Assessment: Previously identified Mitigation

3.18. In addition to the A27 – Southleigh Feasibility Study, the previous Mainland Transport Assessment sought to address the impact of future local plan development, acknowledging that the A27 Warblington Interchange would be significantly affected by the Southleigh development.

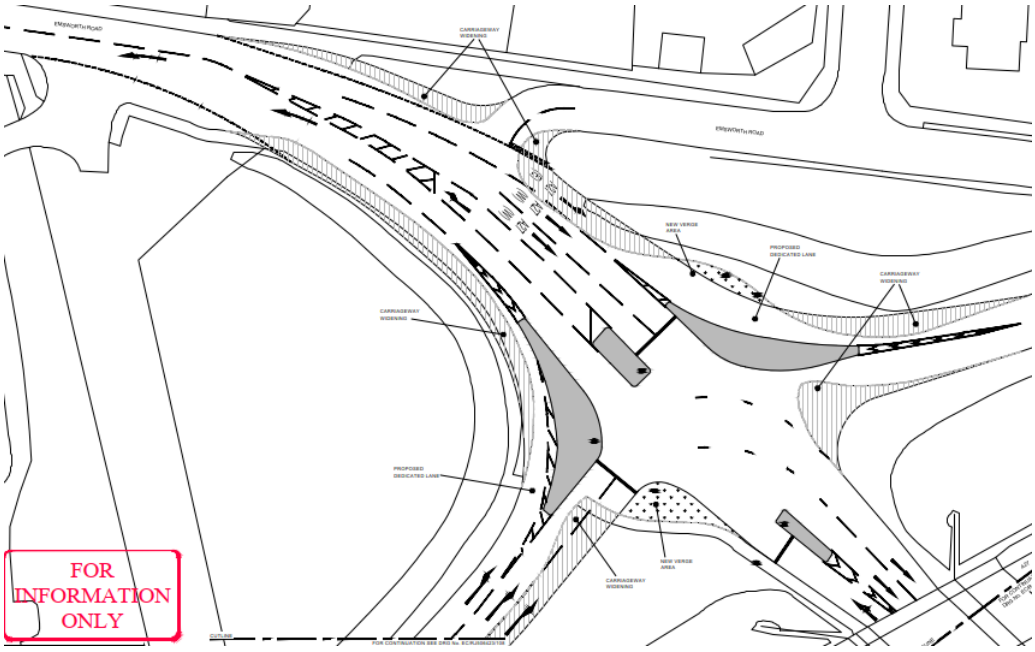
3.19. The proposals modelled in the Do Something (DS) scenario as initial mitigation are illustrated on Drawings EC/RJ506423/107 to 109 attached in Appendix N of SRTM Modelling Report and included the following:

- Widening of the A27 eastbound off slip Rd to three lanes;
- Modification of the northern dumbbell roundabout to a signalised junction including local widening of the A27 on-and off slips and of the Emsworth Rd approach;
- The existing roundabout is converted to a signalised junction with dedicated left turn lanes from Emsworth Road which means that traffic turning left does not need to wait at the new traffic signals. The proposed measures address the forecast capacity issues on Emsworth Rd eastbound and the A27 off slip Road, however westbound traffic is subjected to decrease in capacity, and
- Widening of the A259 exit lane carriageway at the southern dumbbell roundabout to allow effective use of two exit lanes.

3.20. For the purposes of this report, the suggested mitigation has been taken into consideration with obvious benefits from the widening of the off-slip and introduction of the Emsworth Road westbound jet-lane, creating much needed additional capacity. The proposed HBLP TA modifications are included below.

3.21. However, clearly modifications to the suggested mitigation will need to be found to include the proposed Southleigh development site direct link within the signalised junction. This has formed part of the mitigation testing options.

HBCLP Transport Assessment – Warblington Interchange: Proposed Mitigation



4.0 ASSESSMENT OF SOUTHLEIGH STRATEGIC DEVELOPMENT IMPACT: METHODOLOGY

4.1. This Section of the Transport Addendum discusses the relevant assessment in order to establish the impact of a direct access from the Southleigh Strategic site onto the A27. This will help inform the Local Plan process and provide an evidence base to understand whether with such a link, the proposed land allocation at Southleigh can be accommodated without unacceptable transport impacts.

4.2. The following methodology has been undertaken to inform Part 2 of the Assessment, in transport terms:

- Review of SRTM outputs and likely distribution of development traffic taking into account the nature of the roads surrounding the site, including the existence of a level crossing at Warblington Station. This has been an important consideration in terms of re-distribution of traffic that might see a spine road through Southleigh onto the A27 as a more attractive, reliable route;
- Development of traffic models relating to Option 1B for the key junctions (use of Traffic Modelling Tools, such as Paramics, Junctions 9 & Linsig);
- Consideration of the impact of the Southleigh development both as the allocation in its entirety (2,100 homes), and the likely projected development by the end of the Local Plan period (1,100 homes). Testing local models for these scenarios:
    - Scenario 1: 2036 Do Something 1,100 units;
    - Scenario 2: 2036 Do Something 2,100 units.
- A summary of the results for the scenarios (identified above) for the peak times;
- High level advice on the junction outputs and findings, and whether the 2036 Do something Scenario – which includes Option 1B and any subsequent iterations - (all local plan traffic, background growth and appropriate mitigation) is likely to have a significant adverse impact on the existing road network.

Establishing the SRTM Baseline

4.3. Systra, who produced the SRTM which informed the HBCLP TA have provided the relevant trip distribution both for the AM peak and PM peak hours for the proposed Southleigh strategic development site. However, as the SRTM does not currently include a direct access from the Southleigh site onto the A27 (via the Warblington Interchange) there is a need to manually re-distribute the likely development traffic accordingly.

4.4. The proposed Southleigh Strategic Site is an emerging allocation for around 2,100 homes located between Emsworth and Warblington. This corresponds to the SRTM model zones 608, 609 and 614. The modelled housing split in the SRTM to each zone is:

- Zone 608: Up to 1,700 dwellings;
- Zone 609: Up to 200 dwellings;
- Zone 614: Up to 200 dwellings.

4.5. The SRTM and therefore the HBLP TA have made reasonable assumptions that at strategic, zonal level, each zone has a single loading point to the transport network. In the SRTM, traffic from both zones 608 and 609 is 'loaded' onto the link representing Southleigh Road while zone 614 connects to the link representing New Brighton Road.

4.6. The SRTM based HBLP TA included suggested mitigation for the northern roundabout at the Warblington Interchange, which was again based on the assumption that the majority of traffic wanting to travel south or westbound on the A27 would do so via Southleigh Road and then Emsworth Road.

Traffic Generation

4.7. Whilst the TA has assessed the impact of the proposed Local Plan allocations as a whole on the borough network, it is acknowledged that the proposed Southleigh development of 2,100 homes (1,100 of which in the period of the Local Plan to 2036) will be a major contributor in its own right in terms traffic generation for both the immediate locality and the Borough. The estimated peak hour trips for the 2,100 units and 1,100 units as calculated by TRICS are summarised in the tables below:

2,100 Units - Vehicles	Traffic Movements Arrivals	Traffic Movements Departures	Traffic Movements Totals
AM Peak Period (08:00-09:00)	235	800	1035
PM Peak Period (17:00-18:00)	762	312	1078

Table 4.1: Likely Trip Generation for 2,100 homes – total site allocation

1,100 Units - Vehicles	Traffic Movements Arrivals	Traffic Movements Departures	Traffic Movements Totals
AM Peak Period (08:00-09:00)	122	416	538
PM Peak Period (17:00-18:00)	396	162	558

Table 4.2: Likely Trip Generation for 1,100 homes – end of Local Plan Period (2036)

4.8. Given the emphasis that the HBCLP TA has placed on sustainable travel and the need to provide realistic alternatives to the private car, it would be appropriate to assume a conservative reduction (6%) in the numbers above due to the implementation of a thorough Residential and Workplace Travel Plan, which would be expected of a development of this scale.

4.9. Such measures may focus on public transport, walking and cycling routes with the town centre (and other key destinations) and would be implemented early in any development process. While in reality, a greater reduction in the use of private car will be targeted, working closely with relevant Partners and Stakeholders, this conservative level has been used for modelling purposes to help provide a robust assessment on both the proposed direct link to the A27 and the local road network.

4.10. A reduction to the potential trip generation has been applied within Tables 5.3 and 5.4 below, which have been taken forward as part of the junction assessment with regard to any likely Southleigh development impact.

2,100 Units – Vehicles (Travel Plan Reduction)	Traffic Movements Arrivals	Traffic Movements Departures	Traffic Movements Totals
AM Peak Period (08:00-09:00)	221	752	973
PM Peak Period (17:00-18:00)	716	293	1009

Table 4.3: Likely Trip Generation for 2,100 homes – total site allocation with TP measures

1,100 Units – Vehicles (Travel Plan Reduction)	Traffic Movements Arrivals	Traffic Movements Departures	Traffic Movements Totals
AM Peak Period (08:00-09:00)	115	391	506
PM Peak Period (17:00-18:00)	372	152	524

Table 4.4: Likely Trip Generation for 1,100 homes – end of Local Plan Period (2036) with TP measures

Assumed Traffic Distribution

4.11. As discussed in the previous Section, a manual re-distribution of development traffic was required in order to test the impact of a new link to the A27 from the Southleigh development site. This took the relevant volumes of traffic indicated within the SRTM and re-assigned the likely development traffic onto the new link road based on previously identified Census travel information regarding key destinations for work.

4.12. In addition, an assumption was made to include an element of through traffic which may see the new link to the A27 as a more desirable or reliable route compared with that along Southleigh Road and over the existing level crossing. The proposed development traffic distribution is included below for the full site allocation:

Table 4.5: Southleigh development traffic distribution AM Peak.

AM Peak Movements	Distribution %	Traffic Movements (2,100 units)	Average vehicle/min
North via Horndean Road, Emsworth Common Road or Bartons Road (Departing)	30%	226	3.8
East via Horndean Road and North Street towards Emsworth (Departing)	8%	60	1.0
East via new slip A27 eastbound (Departing)	10%	75	1.25
South via new link road towards Warblington Interchange A27 westbound (Departing)	35%	263	4.4
South via new link towards Emsworth via Warblington Interchange (Departing)	5%	38	0.6
West via Southleigh Road towards Town Centre (Departing)	6%	45	0.75
West via new link onto Warblington Interchange towards Town Centre (Departing)	6%	45	0.75
North via Horndean Road, Emsworth Common Road or Bartons Road (Arriving)	30%	66	1.1
East via Horndean Road and North Street towards Emsworth (Arriving)	8%	18	0.3

From East via Warblington Interchange and new link from A27 east (Arriving)	10%	22	0.4
South via new link road from Warblington Interchange A27 westbound (Arriving)	35%	77	1.3
South via new link towards Emsworth via Warblington Interchange (Arriving)	5%	11	0.2
West via Southleigh Road towards Town Centre (Arriving)	6%	13	0.2
West via new link onto Warblington Interchange from Town Centre (Arriving)	6%	13	0.2

Table 4.6: Southleigh Park development traffic distribution PM Peak.

AM Peak Movements	Distribution %	Traffic Movements	Average vehicle/min
North via Horndean Road, Emsworth Common Road or Bartons Road (Departing)	30%	88	1.5
East via Horndean Road and North Street towards Emsworth (Departing)	8%	23	0.4
East via new slip A27 eastbound (Departing)	10%	29	0.5
South via new link road towards Warblington Interchange A27 westbound (Departing)	35%	102	1.7
South via new link towards Emsworth via Warblington Interchange (Departing)	5%	15	0.25
West via Southleigh Road towards Town Centre (Departing)	6%	18	0.3
West via new link onto Warblington Interchange towards Town Centre (Departing)	6%	18	0.3
North via Horndean Road, Emsworth Common Road or Bartons Road (Arriving)	30%	215	3.6
East via Horndean Road and North Street from Emsworth (Arriving)	8%	57	1.0
From East via Warblington Interchange and new link from A27 east (Arriving)	10%	72	1.2
South via new link road from Warblington Interchange A27 westbound (Arriving)	35%	251	4.2
South via new link from Emsworth via Warblington Interchange (Arriving)	5%	36	0.6
West via Southleigh Road from Town Centre (Arriving)	6%	43	0.7
West via new link onto Warblington Interchange from Town Centre (Arriving)	6%	43	0.7

4.13. The above table indicates that the most affected routes are likely to be trips to and from the A27 (west) of the site which will add approximately 4 vehicles per minute to the existing traffic volumes.

5.0 DIRECT LINK MODELLING

5.1. The assessment associated with the Southleigh development site involved traffic modelling being employed at two levels to evaluate the current and future traffic and transport network in Havant Borough.

5.2. Firstly, the Solent Sub-Regional Transport Model (SRTM) has been used to provide an overall strategic assessment of the performance of the future year network.

5.3. This is a strategic modelling tool that represents key movements across the sub-region and is validated to match observed conditions on strategic routes, rather than at an individual junction level. As such, it is a useful tool to identify likely congestion pressures and provide a comparative assessment of different scenarios, but it is not a suitable tool to provide detailed analysis of individual development sites or junctions. Instead, the results of the strategic analysis are used to inform the more detailed assessment.

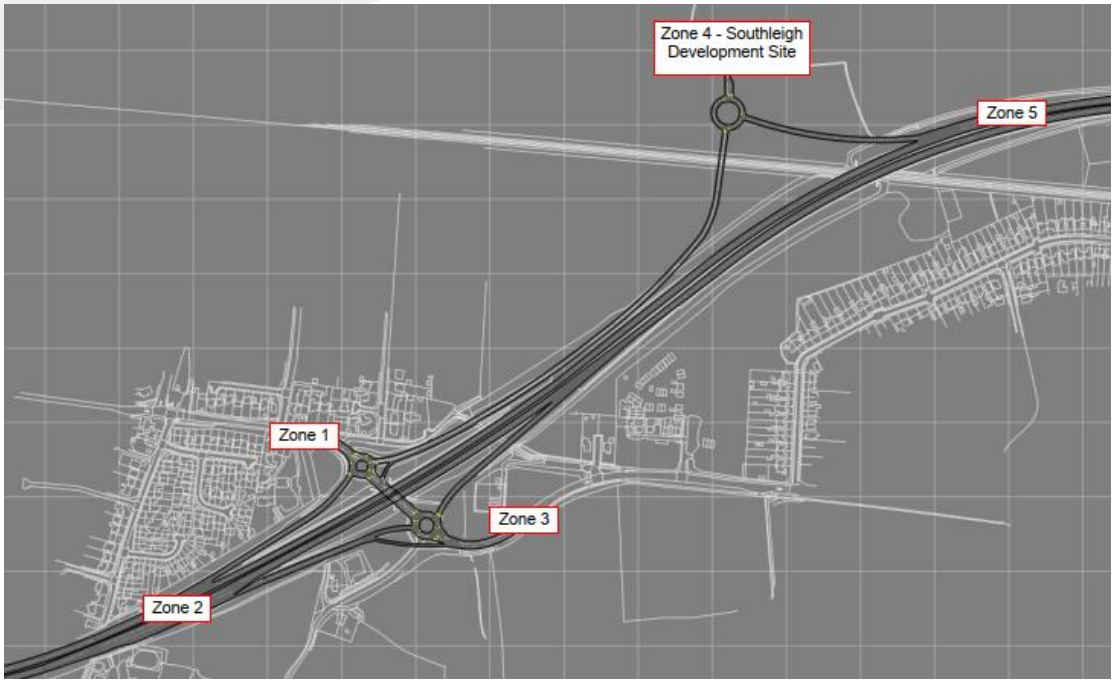
5.4. Part 1 of the HBCLP TAA looked at the detailed modelling of the immediate local road network adjacent to the Southleigh development site to understand whether the existing network is likely to be able to accommodate the full housing allocation. This demonstrated that a number of existing junctions would be come under significant stress as a direct result.

5.5. For Part 2, a further tier of the assessment involved analysis using a specific micro simulation model, using Paramics software, predominantly looking at the direct link from the Southleigh development and the impact on the Warblington Interchange in terms of the immediately affected transport network. This detailed model takes into account the individual geometric characteristics (e.g. number of lanes, lane widths and flare lengths) of a particular junction and is therefore an appropriate tool for assessing forecast congestion and testing potential mitigation measures resulting from proposed development.

5.6. A model was created with five key zones to understand the specific impact at the Warblington interchange, based initially on Option 1B, which has identified this existing connection with the A27 as the most appropriate to add the likely Southleigh development traffic.

5.7. A screenshot of the model and relevant zoning is included below:

Figure 6.1: Paramics Network Overview – Model Zones



5.8. The model was created and tested for two scenarios. The first being the 2,100 unit scheme which represents the whole site allocation and the second the 1,100 unit scheme which is designed to represent the end of the current Local Plan period.

5.9. Both scenarios were tested during the AM and PM Peak periods and were based on the volumes of traffic as indicated from the SRTM 2036 Do Something scenario which takes account of all of HBC's Local Plan development (and background traffic growth) with the addition of appropriate mitigation measures as outlined within the SRTM.

5.10. The traffic generation from the development site has been distributed as per Section 4 to understand the likely queue lengths associated with the Warblington Interchange as a result of the new direct Southleigh link road being constructed.

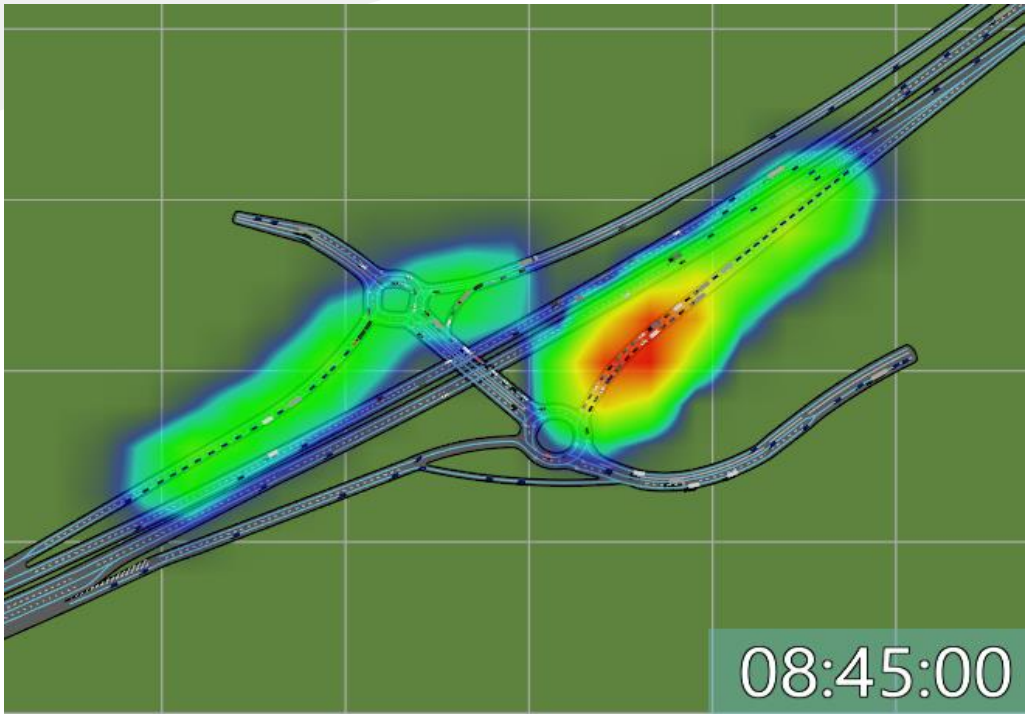
Scenario 1: 2036 Do Something 1,100 units – Option 1B (Paramics Outputs)

5.11. The Southleigh development traffic (up to 1,100) units has been loaded onto the network, as suggested by Option 1B in the Feasibility Study which benefits from alignment changes to the northern roundabout as well as a new jet lane from the A259 – A27 on the southern roundabout. The modifications, as per the HBCLP Transport Assessment have not been included.

5.12. The results indicate that the proposed new direct link onto the existing Warblington interchange (via a two-way link on the northeastern arm) show that congestion appears on the A27 eastbound off-slip, the A27 westbound off-slip and queues are starting to form from the direct link itself. The Congestion heatmap is included in Figure 6.1 below.

5.13. For the purposes of a robust assessment the worst 15 minute period has been selected from the respective Peak Hours:

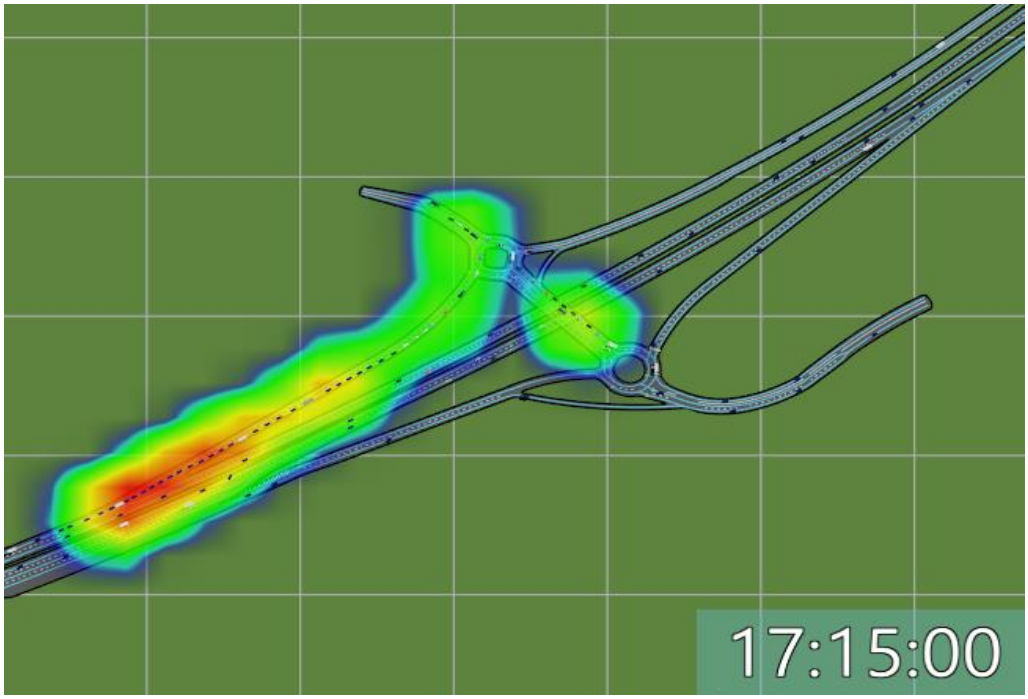
Figure 6.2: Paramics Congestion Heatmap – Scenario 1 AM Peak



5.14. This is predominantly the result of significant volumes of traffic trying to make contrasting right turn movements (i.e. from zone 5 to zones 1 and 4 or zone 2 to zone 3). Significantly, in highway safety terms the queue lengths are beginning to reach a level which could impact on the safe operation of the Strategic Road Network (SRN) which would be considered a severe impact under the National Planning Policy Framework.

5.15. A similar scenario occurs during the PM peak, which is shown below in Figure 6.2, due the volume of traffic returning towards the development and using the northern roundabout at the existing Warblington interchange.

Figure 6.3: Paramics Congestion Heatmap – Scenario 1 PM Peak



Scenario 2: 2036 Do Something 2,100 units: Option 1B – Paramics Outputs

5.16. This process was repeated and re-tested for the wider Southleigh allocation of 2,100 units, with the associated Paramics congestion heat maps included in Figures 6.3 and 6.4 below.

5.17. Unsurprisingly the increased levels of traffic travelling to and from the development site (during the peak periods), compared with Scenario 1, result in increased flows in vehicles travelling to the A27 westbound from the site via the new link road. This in turn, as indicated in Figure 6.3, has a knock in impact on vehicles on the A27 westbound off-slip as they are not able to enter the roundabout and as a consequence a significant queue forms back towards the free flow of traffic on the A27 causing as significant road safety concern. It is also worth noting that there are significant queues forming along the proposed direct link to the A27 which, while not a direct road safety concern, could influence future travel routes and driver choices in terms of using the wider local road network.

Figure 6.4: Paramics Congestion Heatmap – Scenario 2 AM Peak

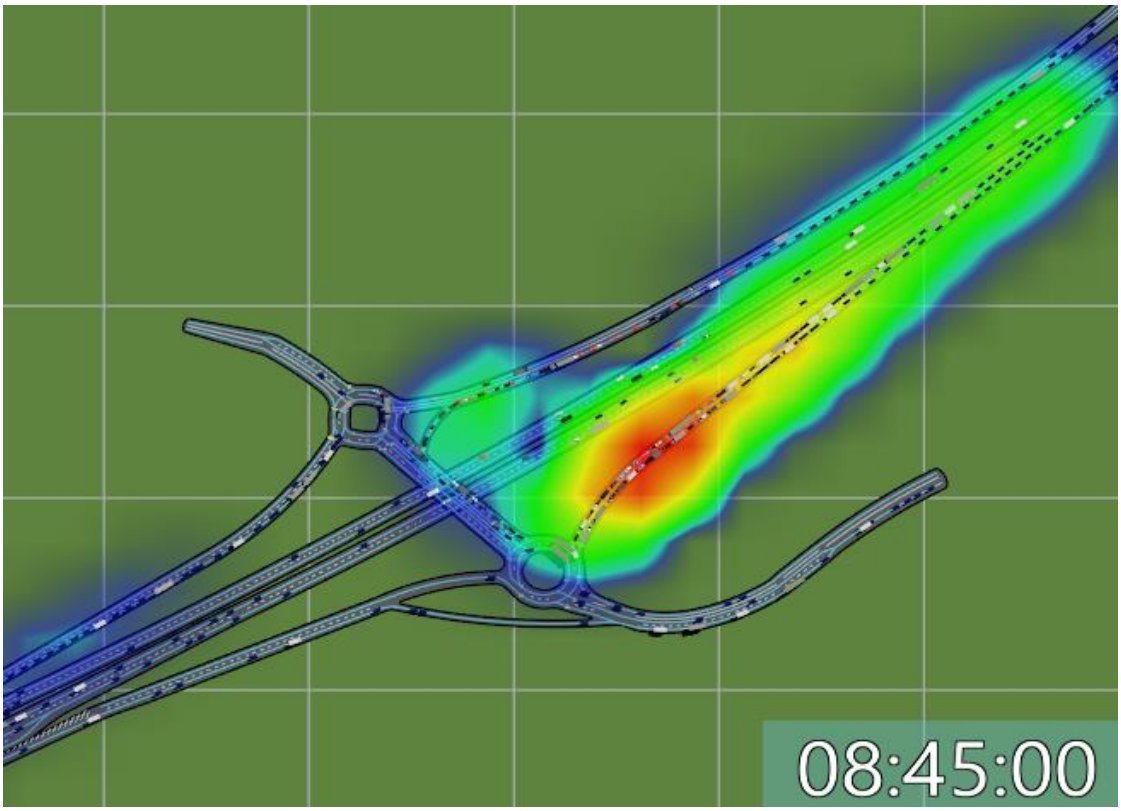
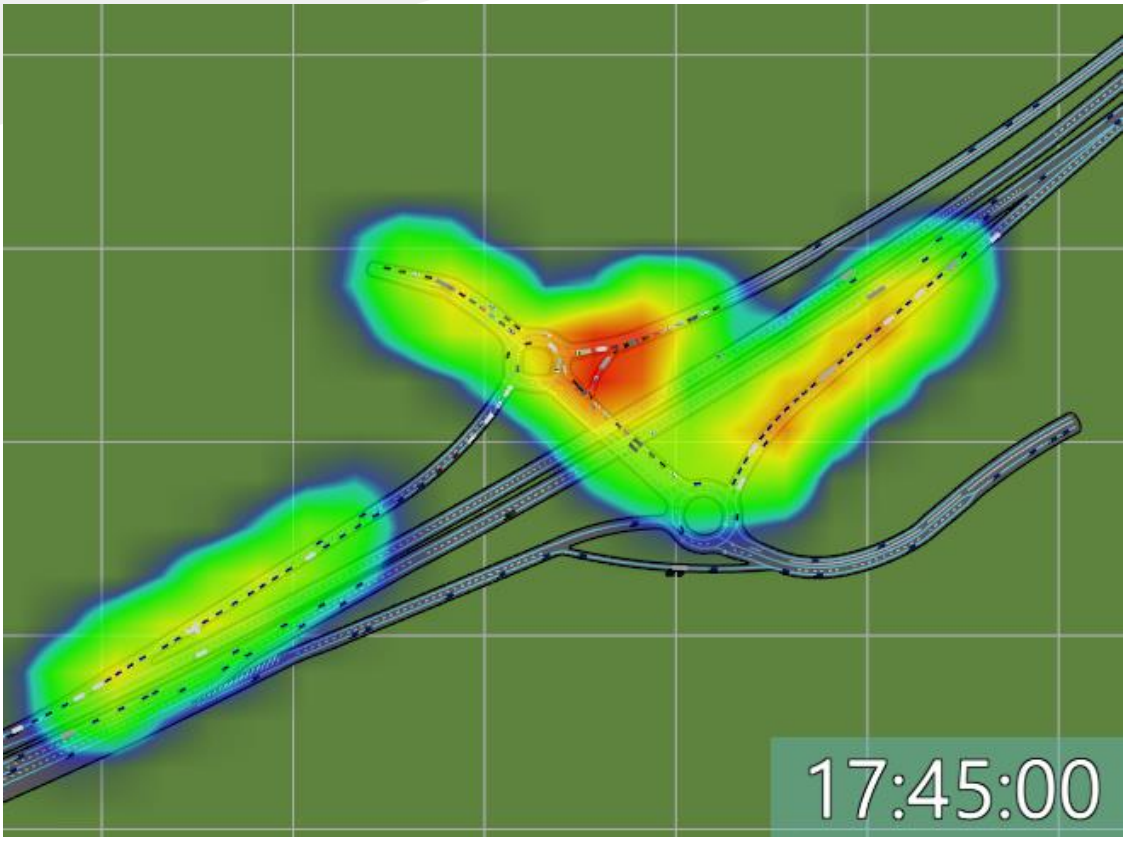


Figure 6.5: Paramics Congestion Heatmap – Scenario 2 PM Peak



5.18. As illustrated by Figure 6.4, the increased numbers of journeys on the Warblington Interchange during the PM Peak generally appear to overwhelm the proposed Option 1B in capacity terms due to the volume of traffic trying to pass through it which is exacerbated by the Southleigh development quantum.

5.19. It is therefore fundamentally necessary to look at mitigation options / junction improvements which would accommodate the likely demand of future development and the increased background traffic levels as a result of traffic growth and wider Local Plan allocations.

5.20. The HBCLP TA, as indicated in Paragraph 5.9, suggested addressing the Local Plan traffic in the form of a signalised junction at the northern roundabout at the Warblington Interchange. It is therefore considered appropriate that a solution combining the suggested HBCLP TA layout and the preferred options as part of the A27 Feasibility Study be looked at and tested accordingly, in transport modelling terms.

5.21. In addition to the Paramics model, individual assessments of the Warblington Interchange (and the two associated roundabouts) have been undertaken using the Junctions 9 assessment suite (ARCADY modules) for a roundabout and LinSig for the signalised junctions. The assessments were carried out during the AM and PM peak periods and were designed to try and optimise the final design of any proposed mitigation.

5.22. It was evident as a result of the Paramics modelling, and further reinforced through the Junctions 9 (ARCADY) assessment, that a traditional roundabout solution is unlikely to work given the volume of contradicting right turn movements and limited ability to increase capacity through additional lanes as demonstrated in Part 1 of the Addendum.

5.23. On that basis, an Option 1B+ was formed which took the key principles from the Option 1B outlined within the A27 Feasibility Study and enhanced the ability to control the junctions through signalising both the northern and southern roundabouts. Snapshots of the proposed roundabout layouts are included below with details of Option 1B+ included in Paragraph 5.23.

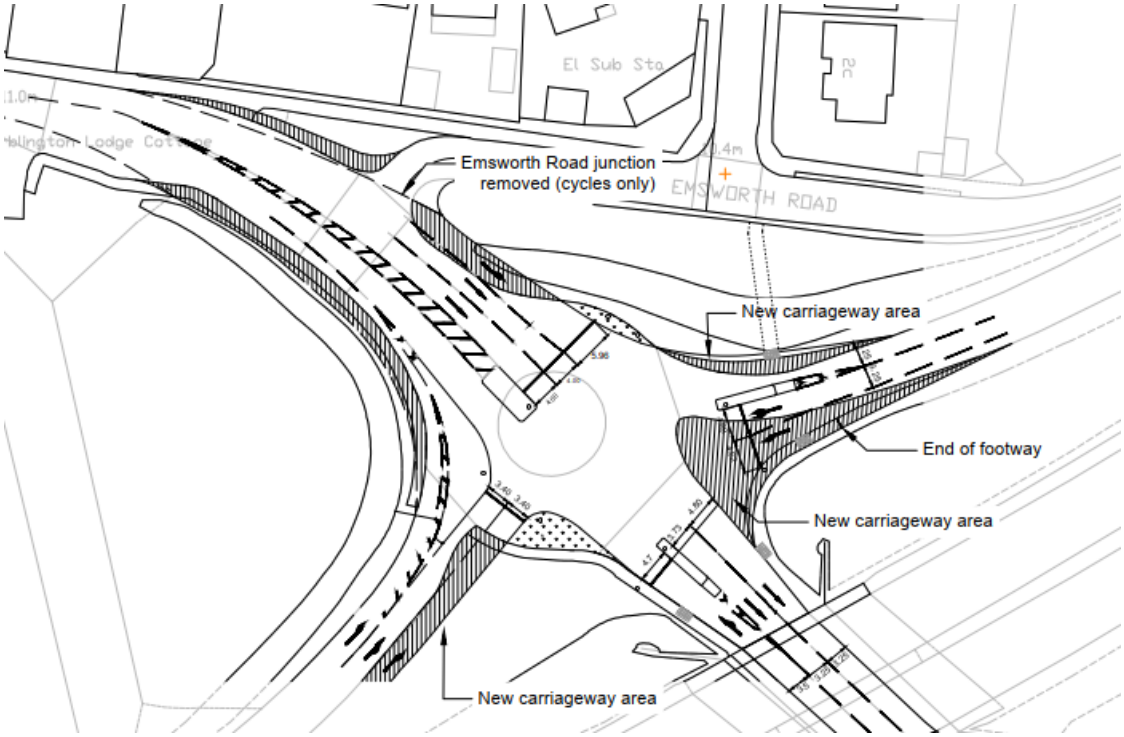


Figure 6.6: Proposed Northern Roundabout (Warblington Interchange) Layout

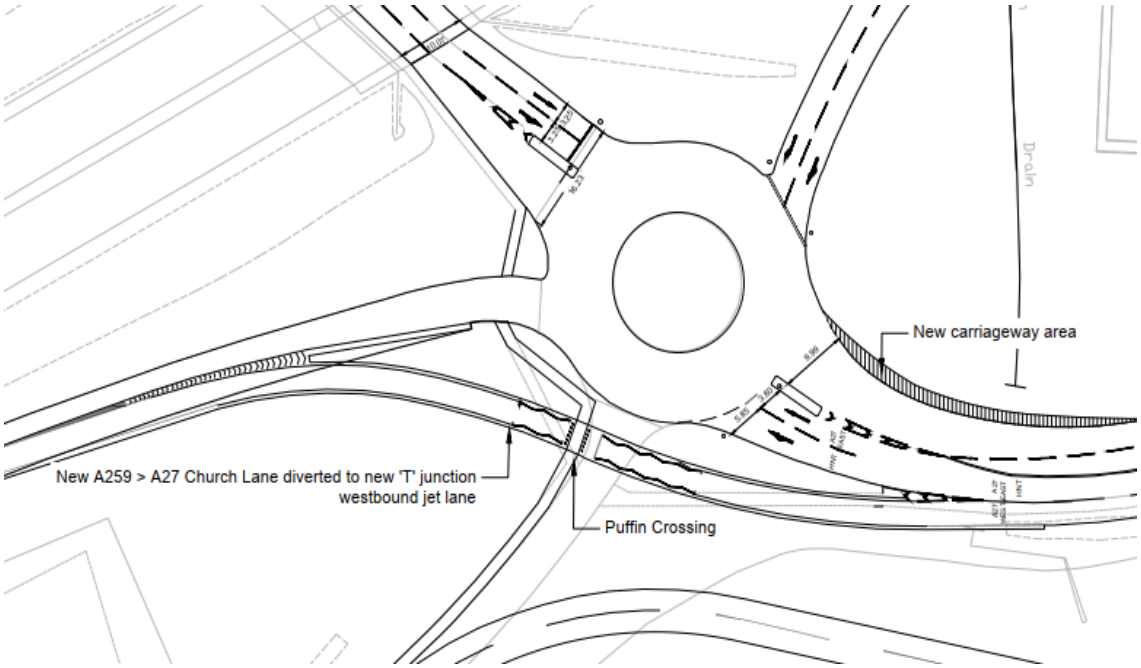


Figure 6.7: Proposed Southern Roundabout (Warblington Interchange) Layout

5.24. This Option, referred to as Option 1B+, includes the following improvements:

- New development link road from the Southleigh development site to the Warblington Interchange including removal of vegetation and new carriageway being introduced;
- Modifications to the A27 E/B on-slip to allow two way traffic from the development site and direct access for eastbound traffic from the development site;
- An additional lane on the A27 eastbound off-slip to provide much needed capacity on the approach to the northern roundabout;
- A new jet lane from the A27 eastbound off-slip onto Emsworth Road (westbound);
- A new jet lane from the A259 Havant Road onto the A27 westbound on-slip, including modifications to the Church Lane access arrangement;
- An intelligent transport system (ITS) which will allow the two roundabouts to be linked, as well as queue length loops to be installed on the off-slips to ensure queuing does not cause any road safety issue; and
- MOVA to be installed to optimise efficiency (although the benefits have not been accounted for within the detailed modelling).

5.25. With regard to the signalised junctions, the results below indicate the current Mean Maximum Queue Lengths (MMQ) and Degree of Saturation (DoS). The DoS (%) is a ratio of demand to capacity on each approach to the junction, with a value of 100% meaning that demand and capacity are equal, and no further traffic is able to progress through the junction. Both Scenario 1 and Scenario 2 were tested using LinSig software for the AM and PM Peak periods, based on the same trip generation and distribution used for the Paramics modelling.

5.26. The modelling outputs have been presented in individual results tables and any arm/junction that is considered over capacity has been shown in red. At this stage of study, no further enhancements through Intelligent Transport Solutions (such as Micro-processor Optimised Vehicle Actuation - MOVA) have been assumed.

Scenario 1: 2036 Do Something 1,100 units: Option 1B+ (LinSig Outputs)

5.27. The summary of traffic modelling results for this junction have been presented in Table 6.1 below. The modelling outputs focus on the likely capacity and queue lengths during AM & PM peak for this junction based on the 2036 forecast year with 1,100 units included for the Southleigh development and accessed via the two roundabouts at the Warblington Interchange.

Table 5.1: Northern Roundabout A27 / Emsworth Road and Southern Roundabout A27 / Havant Road Proposed Linked Signalised Junction during Peak Periods – Scenario 1

Lane	AM Peak		PM Peak	
	MMQ [PCU]	Max Deg. Sat. [%]	MMQ [PCU]	Max Deg. Sat. [%]
1/1 + 1/2: Emsworth Road (S/B) Ahead Left	4.6	48.2	4.6	61.6
1/3: Emsworth Road (S/B) Ahead	5.0	42.3	6.0	68.9
2/2: A27 Off Slip E/B Ahead Right	6.1	44.3	14.5	69.8
2/3: A27 Off Slip E/B Right	7.9	57.9	15.7	76.6

3/1: A259 Havant Road N/B Right Ahead	3.4	52.7	3.6	30.5
6/1: A259 Havant Road S/B Ahead	3.3	25.8	0.5	42.5
6/2: A259 Havant Road S/B Ahead Right	7.5	53.4	2.5	64.1
7/1: Development Link Road W/B Left	0.4	3.6	0.3	3.5
7/2: Development Link Road W/B Left Right	5.6	69.2	2.3	46.3
8/1: A27 Off Slip W/B Left Ahead	0.6	8.5	0.7	14.2
8/2: A27 Off Slip W/B Right	5.4	65.6	1.7	35.7
9/1: A259 Havant Road N/B Left	N/A	Neg	N/A	Neg
9/2: A259 Havant Road N/B Ahead	2.0	15.4	0.7	6.4
12/1: A259 Havant Road Jet Lane	1.3	72.9	0.6	56.4

5.28. The results suggest that the junction would operate satisfactorily based on the assumed traffic generation and distribution. The arms / entry points under the most amount of pressure appear to be the A27 eastbound off slip and the impact that has on green time for the Emsworth Road (southbound) entry and the development link. However, the Degree of Saturation on these approaches still appear well within capacity. It is also clear that the network appears busier during the PM Peak compared to the AM Peak.

5.29. On that basis it is considered that Option 1B+, would facilitate the introduction of a development link road onto the existing Warblington Interchange subject to the signalisation and appropriate optimisation. This arrangement appears to accommodate additional traffic associated with the Southleigh development up to 1,100 units by the end of the Local Plan period.

Scenario 2: 2036 Do Something 2,100 units: Option 1B+ (LinSig Outputs)

5.30. For completeness, the proposed Option 1B+ layout has been tested with the wider Southleigh allocation of 2,100 units for both the AM and PM peak periods.

5.31. For testing purposes the traffic generation associated with the 2,100 units are assumed to be on the network by 2036, along with the wider Local Plan development traffic and background traffic growth. Table 6.2 below, highlights the predicted Degree of Saturation and average queue lengths as a result of the increased traffic.

Table 5.2: Northern Roundabout A27 / Emsworth Road and Southern Roundabout A27 / Havant Road Proposed Linked Signalised Junction during Peak Periods – Scenario 2

Lane	AM Peak		PM Peak	
	MMQ [PCU]	Max Deg. Sat. [%]	MMQ [PCU]	Max Deg. Sat. [%]
1/1 + 1/2: Emsworth Road (S/B) Ahead Left	5.0	56.4	4.9	66.1
1/3: Emsworth Road (S/B) Ahead	5.0	46.8	6.4	74.2
2/2: A27 Off Slip E/B Ahead Right	7.4	54.3	16.4	64.6
2/3: A27 Off Slip E/B Right	8.5	63.9	16.4	78.1
3/1: A259 Havant Road N/B Right Ahead	4.6	62.2	2.2	42.4
6/1: A259 Havant Road S/B Ahead	3.9	27.9	4.3	40.0
6/2: A259 Havant Road S/B Ahead Right	7.9	59.8	9.3	68.0

7/1: Development Link Road W/B Left	0.6	5.7	0.3	3.5
7/2: Development Link Road W/B Left Right	8.4	72.5	4.1	70.6
8/1: A27 Off Slip W/B Left Ahead	0.6	9.1	0.7	15.9
8/2: A27 Off Slip W/B Right	5.9	71.8	3.1	61.9
9/1: A259 Havant Road N/B Left	N/A	Neg	N/A	Neg
9/2: A259 Havant Road N/B Ahead	2.0	16.1	0.8	7.4
12/1: A259 Havant Road Jet Lane	1.4	73.6	0.7	57.3

5.32. The results indicate that the modified junction could continue to operate satisfactorily with the increased levels of traffic. The majority of the increased traffic appears on the A27 eastbound off-slip and the development link road however these are well within acceptable degrees of saturation. Fundamentally, the widening of the A27 eastbound off-slip seems to provide the necessary capacity improvements to help facilitate the future development aspirations of the Local Plan as well as providing limited additional capacity for future growth.

5.33. While this provides a high level overview of the Warblington Interchange (both in the form of Option 1B and Option 1B+), it does demonstrate that Option 1B+ could be introduced to mitigate the impact of the Southleigh development as well as the impact of the wider Local Plan development traffic, subject to costs – which are broadly considered below.

Indicative Costings

5.34. In order to understand the potential deliverability of the Southleigh site in cost terms an understand of the likely costs of Option 1B+ has been included below, taking into account previously estimated costs associated with the A27 Feasibility Study and the HBCLP TA assumed costs for mitigation.

5.35. For the avoidance of doubt the indicative, high level costs represent the improvements detailed in Paragraph 5.23 and have been quantified below:

- A27 Slip road / Emsworth Road and northern roundabout STRM improvements: £3.5m;
- Signalisation of the Warblington Interchange: £0.8m;
- Amendments to the southern roundabout (including jet lane): £1.8m;
- Slip Road modifications for A27 on-slip (eastbound): £1.6m; and
- Creation of new link, including rail crossing, cycleway and attenuation: £11.5m.

5.36. The above costs are for information purposed only and do not include any costs associated with Traffic Management and Preliminaries. A 20% (£3.8m) contingency value has been added to the above to bring the indicative total to circa **£23.0m**. It is also assumed that all land required is either under the control of the Southleigh land owner(s), the Local Planning Authority of the Highway Authorities.

6.0 MODELLING RESULTS SUMMARY

6.1. In order to test the likely impact of a direct road link from the Southleigh development site to connect with the Warblington Interchange, a number of options have been reviewed, appraised and tested. Two scenarios were tested – one for 1,100 units (which relates to the number of units brought forward by the end of the Local Plan Period) and 2,100 units (which assumes the wider development quantum has been brought forward by the end of the Local Plan Period).

6.2. Part 1 of the HBCLP TAA looked at the Warblington Interchange in its current form (baseline), and with the suggested mitigation outlined within the Mainland TA (Do Something), which identified that it is likely to operate over capacity without a new link, due to the increased levels of traffic using the A27 eastbound off-slip and Emsworth Road.

6.3. A Paramics model was developed and used to test a new link and understand the direct impact of the Southleigh development site. Paramics was chosen as the microsimulation software allows real traffic conditions to be simulated and the impacts of increased levels of traffic and/or modifications to a road network (in the form of modified arms or a new junction) to be quickly and accurately assessed. The Paramics outputs identified a number of congestion hotspots and significant queue lengths forming – particularly on the A27 off-slips, back towards the main A27.

6.4. As a result of the Paramics Output, a signalisation scheme of the roundabouts was developed through LinSig – based on the layout and improvements suggested through the mainland HBCLP TA and Option 1B from the A27 Feasibility study. This layout has been designed in 2D layout form, to understand whether a scheme could be developed to accommodate the increased levels of traffic on this section of the network.

6.5. The results suggest that the introduction of up to 2,100 dwellings at the proposed Southleigh development can be accommodated with a limited amount of reserve capacity for future growth. This Option, referred to as Option 1B+ and included as Appendix 4, includes the following improvements:

- New development link road from the Southleigh development site to the Warblington Interchange including removal of vegetation and new carriageway being introduced;
- Modifications to the A27 E/B on-slip to allow two way traffic from the development site and direct access for eastbound traffic from the development site;
- An additional lane on the A27 eastbound off-slip to provide much needed capacity on the approach to the northern roundabout;
- A new jet lane from the A27 eastbound off-slip onto Emsworth Road (westbound);
- A new jet lane from the A259 Havant Road onto the A27 westbound on-slip, including modifications to the Church Lane access arrangement;
- An intelligent transport system (ITS) which will allow the two roundabouts to be linked, as well as queue length loops to be installed on the off-slips to ensure queuing does not cause any road safety issue; and
- MOVA to be installed to optimise efficiency.

Impact on the Local Road Network

6.6. In order to understand what impact the proposed link could have on the existing, local road network, and whether it provides suitable mitigation, it has been necessary to re-model the previously identified junctions (as specified within the TA Addendum Part 1), based on the re-distribution of traffic now predicted to use the A27 direct link as opposed to the existing road network (i.e. Southleigh Road / Emsworth Road or Southleigh Road / Horndean Road / A259). For the avoidance of doubt the following key junctions which have been re-assessed based on the full development quantum of 2,100 dwellings with Option 1B+ in place:

- Southleigh Rd /Emsworth Rd/Pook Lane (Junction ID 25) Signalised Junction;
- Horndean Rd/New Brighton Rd (Junction ID 29) Priority Junction;
- Horndean Rd/Southleigh Rd (Junction ID 60 & 61) Priority Junction.

6.7. The junction outputs have been included as Appendix 6.

6.8. In addition to the above, the effect of the introduction of Option 1B+ has also been considered for the following two junctions:

- Havant Rd/Selangor Avenue (Junction ID 70) Priority Junction;
- Existing Warblington Level Crossing

6.9. The following junctions have not been re-assessed as the distribution of traffic, travelling north to and from the site is unlikely to have reduced as a result of the proposed direct link. These junctions will need specific focus as part of any site specific Transport Assessment prepared as part of any future planning application:

6.10. - Bartons Rd/ Eastleigh Rd (Junction ID A1) Priority Junction;
- Bartons Rd/Horndean Rd /Emsworth Common Rd (Junction ID 31) Staggered Priority Junction.

Southleigh Rd /Emsworth Rd/Pook Lane (Junction ID 25) - Currently Signalised

6.11. The summary of traffic modelling results for this junction have been presented in Table 6.1 below, taking into account the potential redistribution (and subsequent reduction) of traffic using the direct link through the Southleigh site onto the A27 as opposed to travelling through this junction – particularly for Southleigh development traffic itself.

6.12. The modelling outputs identify potential problems with capacity and queue lengths during AM & PM peak for this junction, particularly during the 2036 Do Minimum scenario. For the avoidance of doubt the 2036 Do Something Scenario now includes the introduction of Option 1B+ and development traffic movements have been re-routed via the direct link to and from the A27.

6.13. This junction is currently operating under Micro-processor Optimised Vehicle Actuation (MOVA). Details of traffic signal junction (phase and inter-green timings and method of control) have been provided by Hampshire County Council.

Table 6.1: Southleigh Rd /Emsworth Rd/Pook lane Junction ID 25- Currently Signalised-Linsig Model

		AM Peak						PM Peak					
Cycle Time	**90 secs**	**2036 Baseline**		**2036 Do Minimum**		**2036 Do Something**		**2036 Baseline**		**2036 Do Minimum**		**2036 Do Something**	
Lane Description	**Linsig arm/ lane**	**Deg Sat (%)**	**MMQ (pcu)**	**Deg Sat (%)**	**MMQ (pcu)**	**Deg Sat (%)**	**MMQ (pcu)**	**Deg Sat (%)**	**MMQ (pcu)**	**Deg Sat (%)**	**MMQ (pcu)**	**Deg Sat (%)**	**MMQ (pcu)**
Southleigh Rd Right Ahead Left	1/1 + 1/2	92.1	12.9	138.6	130.8	104.5	28.5	109.4	18.8	147.5	62.8	105.6	17.2
Emsworth Rd East Right Ahead Left	2/1 + 2/2	70.6	7.4	88.1	10.2	65.0	8.7	116.6	44.6	161.0	165.9	76.3	4.5
Pook Lane Ahead Left Right		18.8	0.8	18.80	0.8	18.8	0.8	18.8	0.8	18.8	0.8	18.8	0.8
Emsworth Rd West Left Right Ahead		90.0	11.1	132.90	51.4	105.6	24.8	112.4	50.6	167.6	137.4	116.1	66.9

6.14. The results indicate that the introduction of Option 1B+ has a positive impact on the operation of the junction which is to be expected given the likely re-routing of development traffic. However, the Southleigh Road and Emsworth Road continue to operate over capacity in the 2036 Do Something scenario.

6.15. While the analysis has focussed on the junction in isolation, there is an opportunity to 'link' this junction with the proposed Option 1B+ with MOVA to introduce further capacity at this junction. The above results are also based on the 2,100 unit Southleigh development option, which is likely to have an impact on the Emsworth Road approaches for vehicles travelling between the site and the west, which avoid the A27.

6.16. It is therefore considered that while Option 1B+ does have a positive impact on this junction, that further mitigation may be required (either through signal timing / cycle adjustment or the introduction of MOVA), and should be identified through any future site specific Transport Assessment.

Horndean Rd/New Brighton Rd-Junction ID 29

6.17. This is a priority junction and a summary of the PICADY modelling is presented in Table 6.2, taking into account of the introduction of Option 1B+ in the 2036 Do Something scenario. It is considered that a number of trips previously assigned to this route as part of the 2036 baseline and Do Minimum scenario will now utilise the direct link to the A27 for westbound and southbound trips.

Table 6.2: Horndean Rd/New Brighton Rd-Junction ID 29- PICADY Model

	AM Peak					
	2036 Baseline		**2036 Do Minimum**		**2036 Do something**	
	Queue (PCU)	**RFC**	**Queue (PCU)**	**RFC**	**Queue (PCU)**	**RFC**
New Brighton Rd-LT	4.7	0.83	13.2	0.99	3.3	0.76
New Brighton Rd-RT	1.2	0.54	2.1	0.68	0.7	0.40
Horndean Rd South RT	3	0.61	4.5	0.7	1.5	0.49
	PM Peak					
	2036 Baseline		**2036 Do Minimum**		**2036 Do something**	
	Queue (PCU)	**RFC**	**Queue (PCU)**	**RFC**	**Queue (PCU)**	**RFC**
New Brighton Rd-LT	1.2	0.52	1.4	0.56	0.7	0.40
New Brighton Rd-RT	12	1.35	116.1	High	1.0	0.49
Horndean Rd South RT	116.1	1.22	364.5	1.62	6.2	0.81

6.18. The results show that the reduction in traffic using Horndean Road for trips onto the A27 (both eastbound and westbound), will have a positive impact on the operation of this junction in 2036.

Horndean Rd/Southleigh Rd-Junction ID 60 & 61

6.19. Summary of the PICADY modelling results for this priority junction are presented in Table 6.3 below, taking into account the introduction and implementation of Option 1B+. It is considered likely that a re-distribution of traffic would occur between the development site and the A27 westbound and the A27 eastbound (departing the site) which is shown below in the 2036 Do Something Scenario.

Table 2: Horndean Rd/Southleigh Rd-Junction ID 60-61 -PICADY Model

	AM Peak					
	2036 Baseline		**2036 Do Minimum**		**2036 Do something**	
	Queue (PCU)	**RFC**	**Queue (PCU)**	**RFC**	**Queue (PCU)**	**RFC**
Southleigh Rd West-LT&RT	2.6	0.74	91.5	1.55	1.3	0.56
Horndean South-RT	0.1	0.06	0.1	0.07	0.1	0.06
Southleigh Rd East-RT	1.8	0.65	9.2	0.95	1.6	0.62
Horndean Rd North-RT	0	0	0	0	0.3	0.21
	PM Peak					
	2036 Baseline		**2036 Do Minimum**		**2036 Do something**	
	Queue (PCU)	**RFC**	**Queue (PCU)**	**RFC**	**Queue (PCU)**	**RFC**
Southleigh Rd West-LT&RT	8.8	0.99	33.4	1.38	4.1	0.83
Horndean South-RT	0.1	0.13	0	0	0.0	0.00
Southleigh Rd East-RT	3.7	0.8	8.3	0.94	2.0	0.68
Horndean Rd North - RT	0	0	0	0	0.7	0.41

6.20. The modelling results indicate that the combined impact of the SRTM interventions and the re-distribution of traffic that is likely to occur as a result of a direct link with the A27 through the Southleigh site, and subsequently a more attractive route for those travelling eastbound (on the A27), southbound or westbound, will return the junction to working within operational capacity.

Havant Rd/Selangor Avenue-Junction ID 70

6.21. The 2036 forecast figures have been tested with the model of the junction based on the 2019 scenario that was used and assessed as part of the SRTM. However, physical changes have been implemented at this junction in connection with planning permission APP/16/00774.

6.22. The permission is for the erection of 147 dwellings with associated parking, access, landscaping, and surface water drainage, pumping station, sub-station and signalised junction onto Havant Road (amended scheme). It is considered likely that the site specific Transport Assessment submitted as part of the planning permission and subsequent S278 Agreement to undertake the highway works will have mitigated the impact of development and background traffic growth.

6.23. This, coupled with the likelihood that Southleigh traffic is likely to use the direct link to and from the A27, resulting in fewer vehicles using this junction than previously forecast (as a direct result of the introduction of Option 1B+), it would suggest that this junction should operate within capacity but would need to be confirmed as part of any Southleigh development planning application.

Warblington Level Crossing

6.24. Notable benefits are likely to arise as a result of Option 1B+ on the level of queueing that currently occurs at the level crossing. It is anticipated that approximately 300 vehicles could be re-distributed from Southleigh Road (southbound) and an additional 100 vehicles northbound, onto the new direct Southleigh development site link road with the Warblington Interchange during the AM Peak.

6.25. During the PM Peak a similar level of traffic could again be redistributed away from Southleigh Road, albeit the demand and travel direction being reversed with up to 280 vehicles travelling northbound and circa 95 vehicles travelling southbound towards the Level Crossing using the alternative route.

6.26. While there will ultimately be a fluctuation of traffic volumes using the two routes until a balance has been established, any reduction in traffic along Southleigh Road will inevitably lead to fewer or shorter queues occurring as a result of the Level Crossing being down.

7.0 CONCLUSION

7.1. This Report forms Part 2 of the HBCLP TA Addendum and looks at the potential form and alignment of any direct link both for the duration of the Local Plan as well as the impact of the full Southleigh development of 2,100 units. It provides the high level information required to inform the Local Plan process without providing the development specific, detailed analysis that would be expected as part of a development led TA. This report is designed to complement the strategic modelling (use of the SRTM) previously undertaken as part of the HBCLP TA.

7.2. As suggested within Part 1 of the HBCLP TAA, a genuine need for a new link to be considered (as a result of the proposed Local Plan development and background traffic growth) has been established. This further Addendum (Part 2) has sought to understand the impact of local trips being redistributed along a new section of the network and whether this can be safely accommodated, through the testing of new link options.

7.3. The Part 2 assessment involved analysis using a specific micro simulation model, using Paramics software, predominantly looking at the direct link from the Southleigh development and the impact on the Warblington Interchange in terms of the transport network surrounding the site. This detailed model takes into account the individual geometric characteristics of a particular junction and therefore, an appropriate tool for assessing forecast congestion and testing potential mitigation measures resulting from proposed development.

7.4. Two scenarios were tested, the first being the 2,100 unit scheme which represents the whole site allocation and the second, a 1,100 unit scheme which is designed to represent the end of the Local Plan period. Both scenarios were tested during the AM and PM Peak periods and were based on the volumes of traffic as indicated from the SRTM 2036 Do Something scenario which takes account of HBC's Local Plan development (and background traffic growth) with the addition of appropriate mitigation measures as outlined within the SRTM.

7.5. The traffic generation from the development site was manually re-distributed from the HBCLP TA to take into account the new direct link and help understand the likely queue lengths associated with the Warblington Interchange as a result of the new direct Southleigh link road being introduced.

7.6. It was evident as a result of the Paramics modelling, and further reinforced through the Junctions 9 (ARCADY) assessment, that a traditional roundabout solution is unlikely to work given the volume of contradicting right turn movements and limited ability to increase capacity through additional lanes. On that basis, an Option 1B+ was formed and tested through the LinSig software, which took the key principles from the Option 1B outlined within the A27 Feasibility Study and enhanced the ability to control the junctions through signalising both the northern and southern roundabouts.

7.7. On that basis it is considered that Option 1B+, could facilitate the introduction of a development link road onto the existing Warblington Interchange subject to the signalisation and appropriate optimisation. This arrangement appears to accommodate additional traffic associated with the Southleigh development up to 1,100 units by the end of the Local Plan period. As a result of the works identified in Option 1B+, future capacity is available which could accommodate the full Southleigh Development quantum of 2,100 dwellings although it is acknowledged that the traffic generation associated with the remaining 1,000 units (that are unlikely to be occupied within this Local Plan period) can also be accommodated.

7.8. There is also a positive impact on the immediate local road network, in terms of traffic being re-distributed along the proposed direct link to and from the A27 via a new, alternative route. In the absence of Option 1B+, traffic would be forced to use Southleigh Road, Horndean Road and Emsworth Road to travel between the Southleigh Development Site and the A27.

7.9. By reducing the level of traffic from the existing local road network, the existing junctions (immediately adjacent the site) no longer require the level of physical mitigation that would be sought without Option 1B+. Without any alternative route, the forecast level of traffic in 2036 would still occur on the existing road network – likely to cause a number of junctions to operate at or over capacity which, in turn, would create a congested, sensitive network.

8.0 TECHNICAL GLOSSARY

This section includes a glossary relating to the technical elements of the Report.

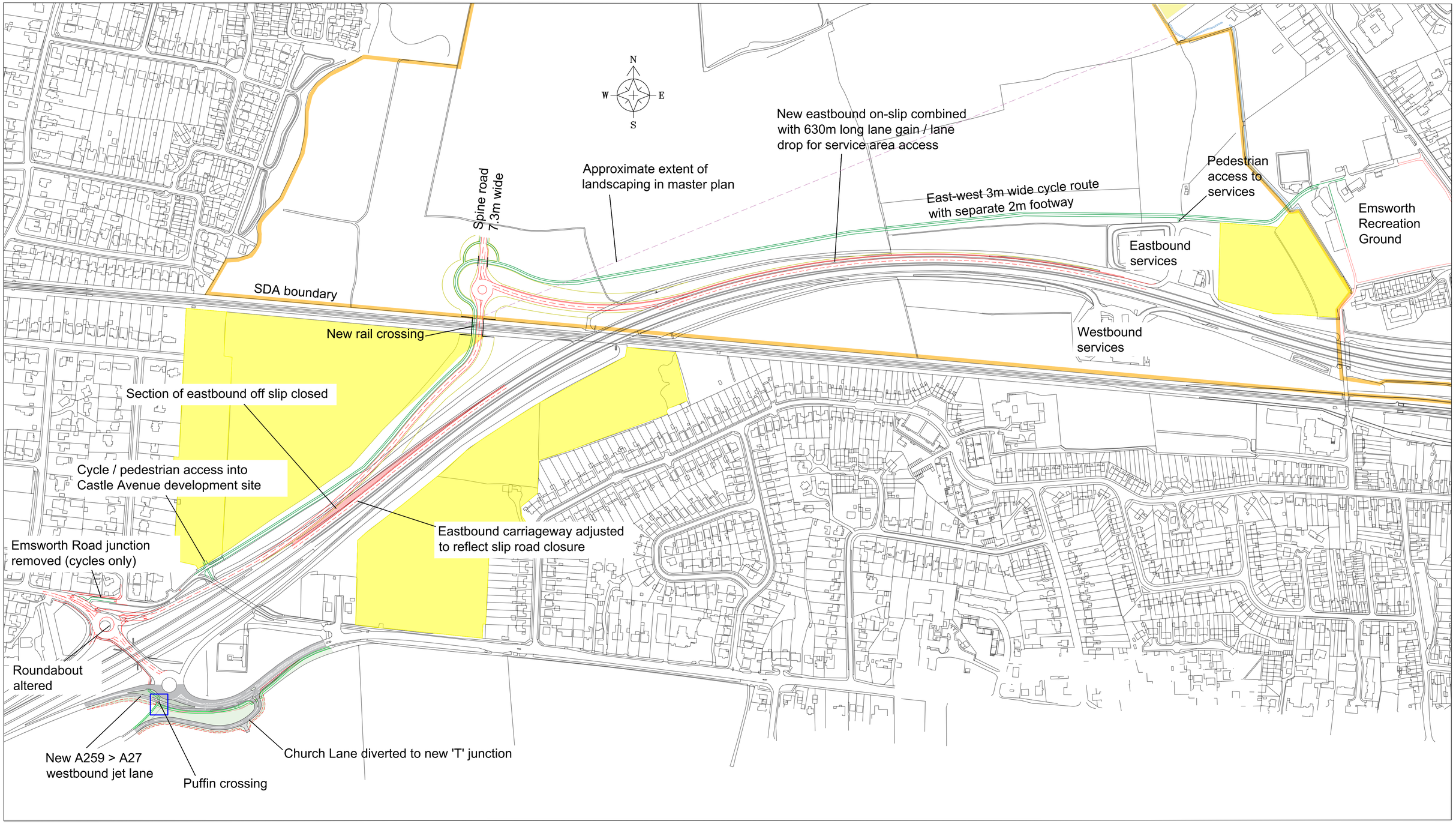
Sub-Regional Transport Model (SRTM): The transport model that underpins the Local Plan evidence base for the mainland Transport Assessment. https://solent-transport.com/srtm

Degree of Saturation (DoS): Saturation flow is the term used to measure of the maximum rate of flow of traffic, typically for signalised junctions. The Degree of Saturation is expressed as a % and details how busy the junction is compared to the maximum rate of flow.

Maximum Mean Queue (MMQ): The MMQ is the estimated mean number of vehicles (or pcus) which have added onto the back of the queue up to the time when the queue finally clears.

Passenger Car Units (PCU): A Passenger Car Unit is a standardised measure used primarily to assess highway capacity, for modelling purposes. Different vehicles are assigned different values, according to the space they take up. A car has a value of 1; smaller vehicles will have lower values, and larger vehicles will have higher values.

Appendix 1: Option 1B Layout and Detail



Committed or proposed development areas additional to SDA

REV	AMENDMENTS	DATE	CAD	CHKD	APPD

CLIENT
Havant BOROUGH COUNCIL
Planning
Civil Engineering and Landscape
Public Service Plaza
Civic Centre Road
Havant. Hants. PO9 2AX
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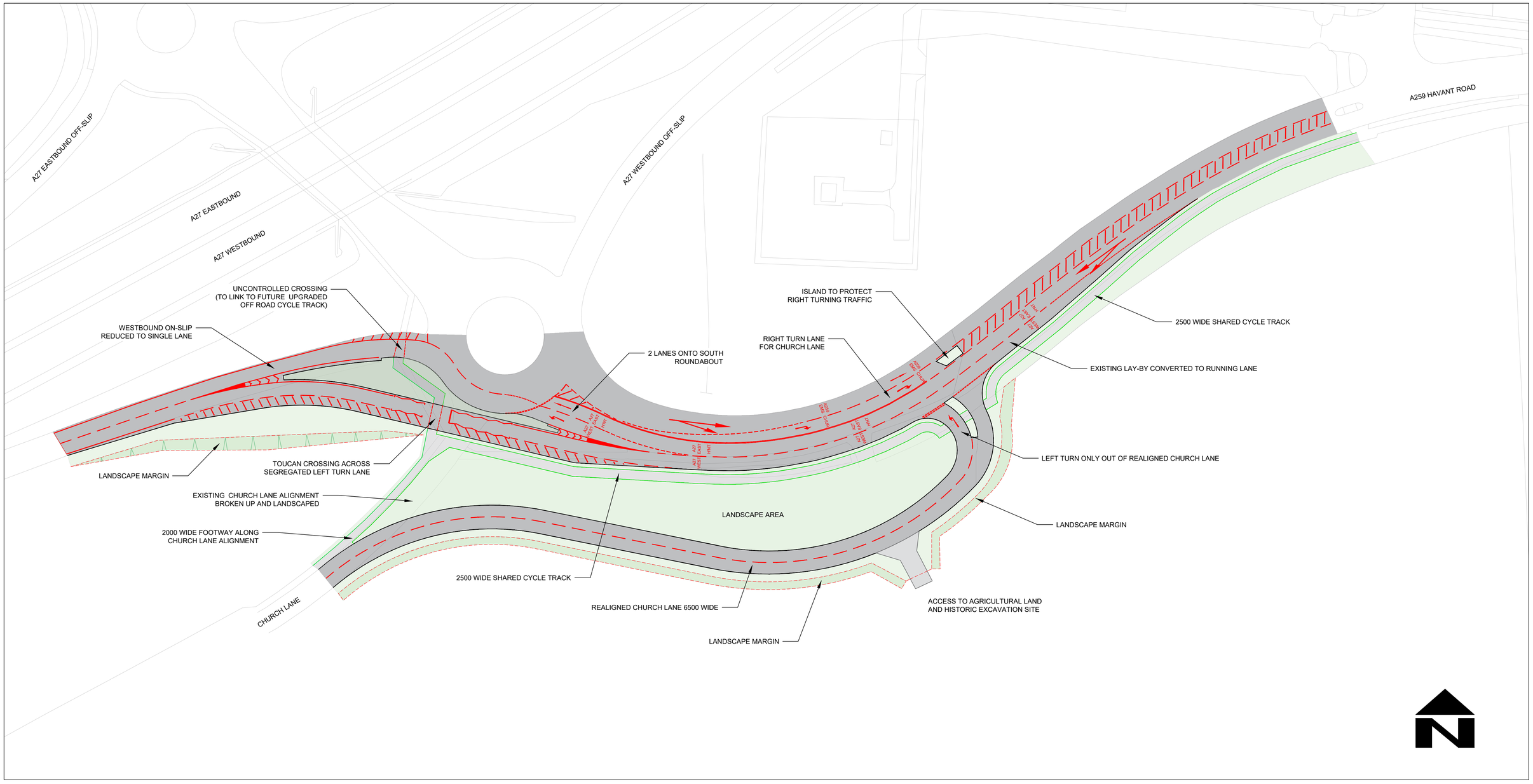
Internet: www.havant.gov.uk

CONSULTANT

DESIGNER: SM	SCHEME: A27 FEASIBILITY STUDY			DRAWING TITLE: 1st PREFERRED OPTION 1B INDICATIVE LAYOUT
CAD: SM				
CHECKED:	JOB No.			CAD PLOT: 10/02/2016 10:15:58
APPROVED:	SCALE @ A1: 1:2500	DATE: 28.08.2020	SHEET NUMBER:	DRAWING NUMBER: REV



KEY DESIGN CRITERIA

LENGTH OF SEGREGATED LEFT HAND ('JET') LANE	72M
MINIMUM KERBSIDE RADIUS IN JET LANE	64M
CARRIAGEWAY WIDTH (INCL. OF 0.3M OFFSET)	6.5M
STOPPING SIGHT DISTANCE	90M

NOTE: THIS DOES NOT INCLUDE LINING CHANGES TO THE ROUNDABOUT RESULTING FROM THE SELANGOR AVENUE DEVELOPMENT

NOTE: THIS LAYOUT IS PHASE 1 OF 'ACCESS TO SOUTHLEIGH' JUNCTION CHANGES BUT RESPONDS TO DEVELOPMENT ON A259 IN WEST SUSSEX

REV	AMENDMENTS	DATE	CAD	CHKD	APPD
B	REVISED FOLLOWING SAFETY AUDIT AND FEEDBACK	21.01.2020	SM		
A	DESIGN NOTES ADDED; LANDSCAPE MARGIN AMENDED FOR 90M SSD	05.11.2019	SM		

CLIENT

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Internet: www.havant.gov.uk

CONSULTANT

DESIGNER	SM
CAD	SM
CHECKED	
APPROVED	

SCHEME: A27 / A259 WARBLINGTON INTERCHANGE

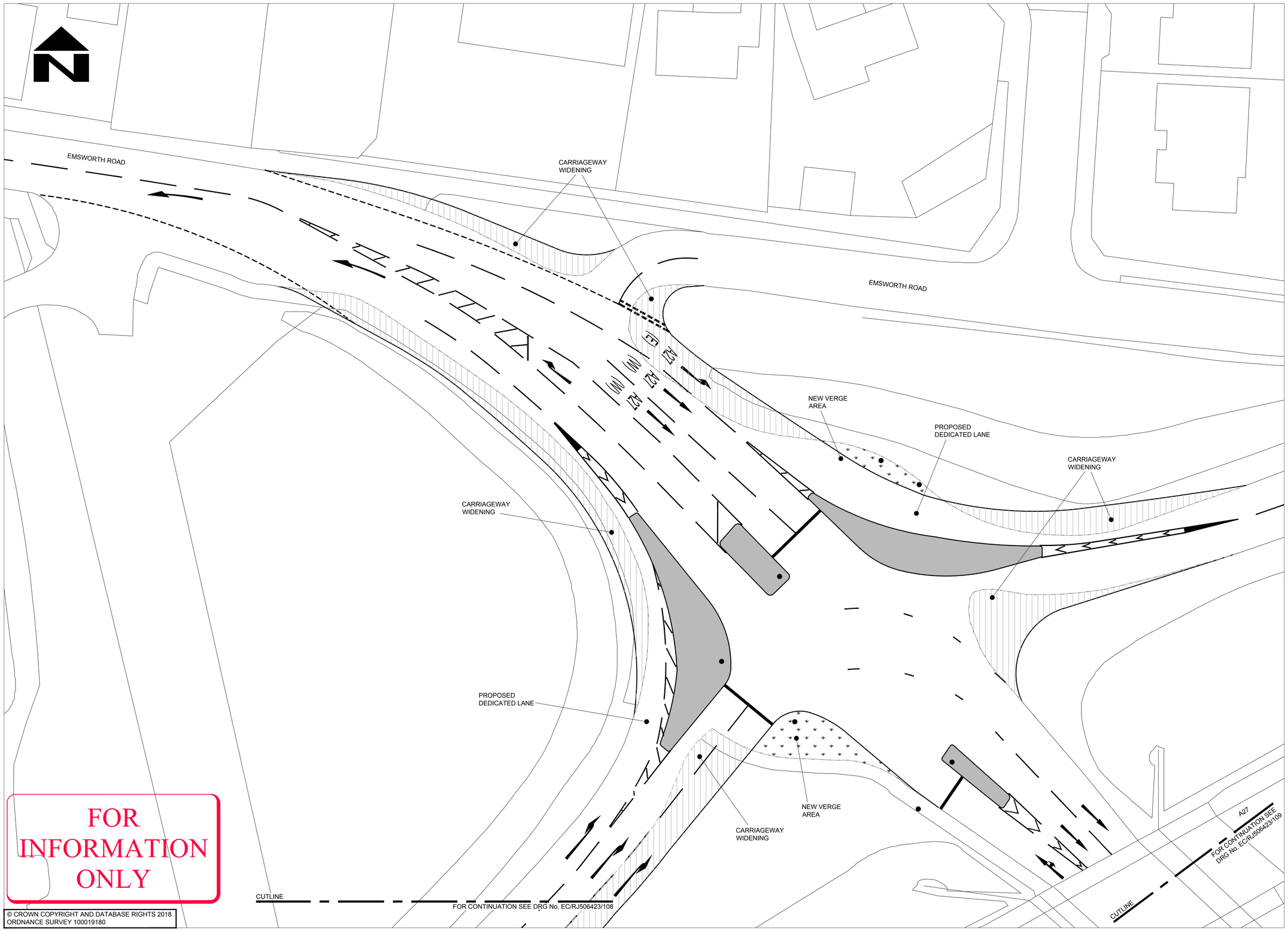
DRAWING TITLE: CONCEPTUAL LAYOUT FOR FEASIBILITY

JOB No.	SCALE @ A1	DATE	SHEET NUMBER	DRAWING NUMBER	REV
	1:500	21.01.2020	1 OF 1	2019-12/002	B

CAD PLOT: 10/02/2016 10:15:58

FILE LOCATION: J:\HBC\Corporate data\Community Group\Engineering and Landscape\File Drawer\Projects\Emsworth\Warblington Interchange\Drawings\Current\Interchange proposals.dwg

Appendix 2: SRTM Mitigation Layout



NOTES

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2. ALL DIMENSIONS IN METRES UNLESS OTHERWISE STATED.
3. THIS DRAWING HAS BEEN PRODUCED TO BE USED FOR TRAFFIC MODELLING PURPOSES ONLY.
4. THIS DRAWING IS A CONCEPT DOCUMENT ONLY AND HAS NOT BEEN SUBJECT TO A FULL DETAILED HIGHWAY DESIGN. IF THE CONCEPT IS TO BE PROGRESSED FURTHER A FULL DETAILED DESIGN EXERCISE WILL BE CARRIED OUT.
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KEY

NEW CARRIAGEWAY CONSTRUCTION

NEW FOOTWAY / ISLAND CONSTRUCTION

NEW TRAFFIC SIGNAL

0 5 10 20 30 40 50 100

FOR INFORMATION ONLY

REV	AMENDMENTS	DATE	CAD	CHKD	APPD

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HAMPSHIRE COUNTY COUNCIL
ECONOMY, TRANSPORT AND ENVIRONMENT DEPARTMENT
STRATEGIC TRANSPORT

CONSULTANT

Hampshire County Council Engineering Consultancy

STUART JARVIS BSc DipTP FCIHT MRTPI: DIRECTOR OF ECONOMY, TRANSPORT & ENVIRONMENT

DESIGNER	SS
CAD	MJE
CHECKED	SS | SS
APPROVED	AT | AT

SCHEME: HAVANT TA JUNCTION ASSESSMENT
JOB No. RJ506423.01

DRAWING TITLE: JUNCTION 26 EMSWORTH ROAD / A27 SLIP ROAD
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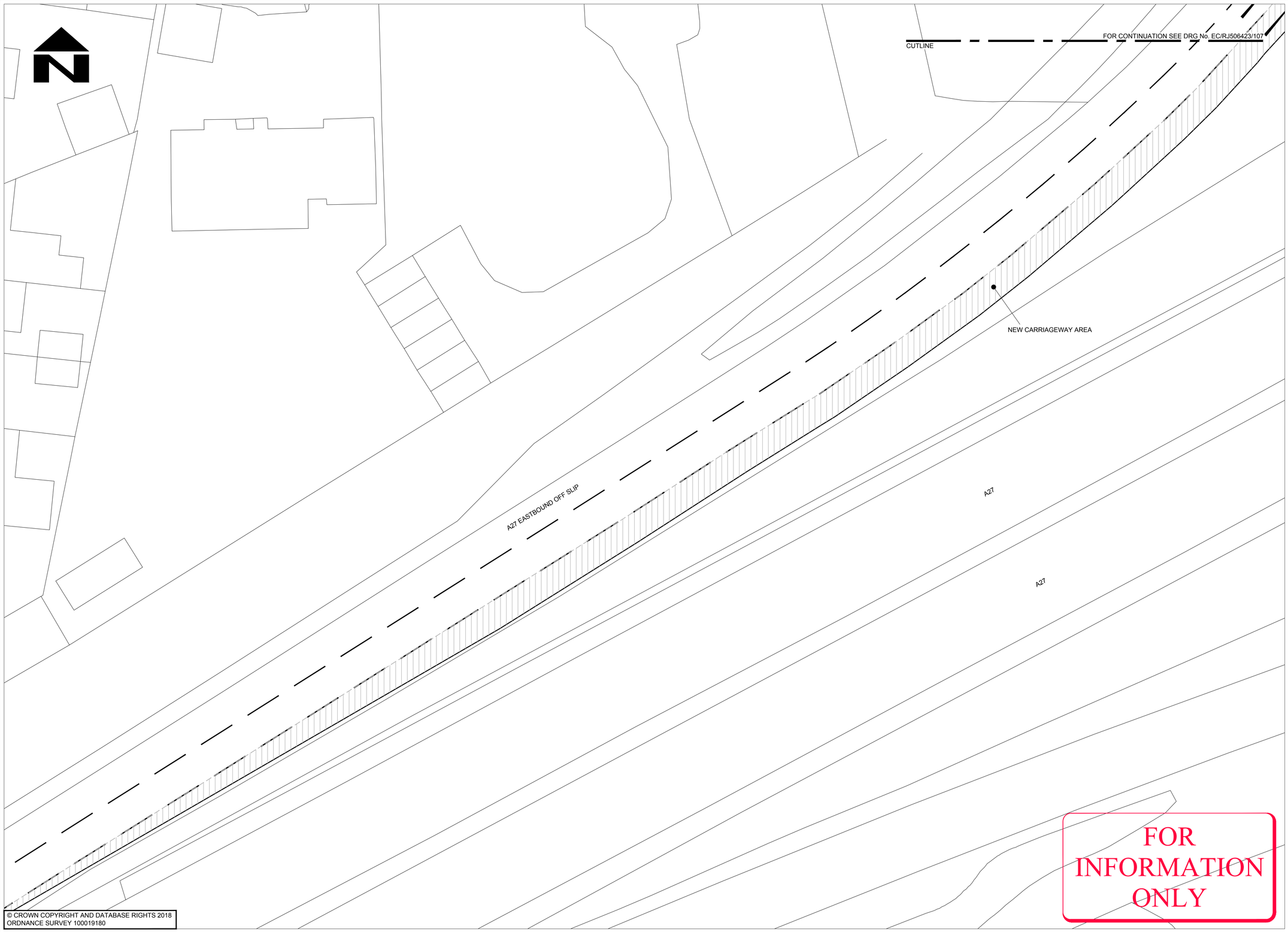

NOTES

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KEY

NEW CARRIAGEWAY CONSTRUCTION

NEW FOOTWAY / ISLAND CONSTRUCTION

NEW TRAFFIC SIGNAL

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FOR INFORMATION ONLY

REV	AMENDMENTS	DATE	CAD	CHKD	APPD

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ECONOMY, TRANSPORT AND ENVIRONMENT DEPARTMENT
STRATEGIC TRANSPORT

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STUART JARVIS BSc DipTP FCIHT MRTPI: DIRECTOR OF ECONOMY, TRANSPORT & ENVIRONMENT

DESIGNER	SS
CAD	MJE
CHECKED	SS | SS
APPROVED	AT | AT

SCHEME: HAVANT TA JUNCTION ASSESSMENT
JOB No. RJJ506423.01

DRAWING TITLE: JUNCTION 26 EMSWORTH ROAD / A27 SLIP ROAD
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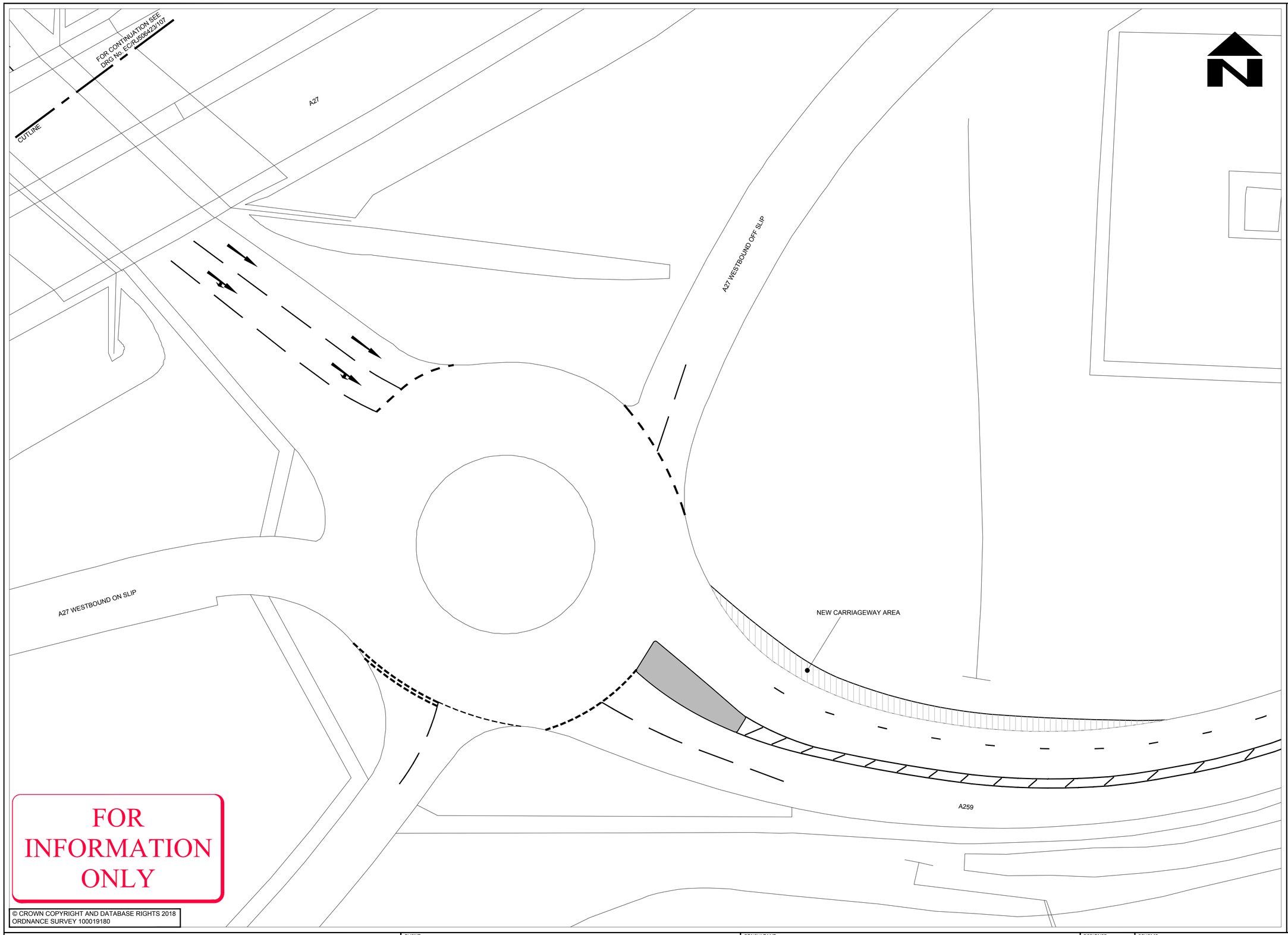

NOTES

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3. THIS DRAWING HAS BEEN PRODUCED TO BE USED FOR TRAFFIC MODELLING PURPOSES ONLY.
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0 5 10 20 30 40 50 100

KEY

NEW CARRIAGEWAY CONSTRUCTION

NEW FOOTWAY / ISLAND CONSTRUCTION

NEW TRAFFIC SIGNAL

FOR INFORMATION ONLY

REV	AMENDMENTS	DATE	CAD	CHKD	APPD

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ECONOMY, TRANSPORT AND ENVIRONMENT DEPARTMENT
STRATEGIC TRANSPORT

CONSULTANT

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STUART JARVIS BSc DipTP FCIHT MRTPI: DIRECTOR OF ECONOMY, TRANSPORT & ENVIRONMENT

DESIGNER	SS
CAD	MJE
CHECKED	SS | SS
APPROVED	AT | AT

SCHEME: HAVANT TA JUNCTION ASSESSMENT
JOB No. RJJ506423.01

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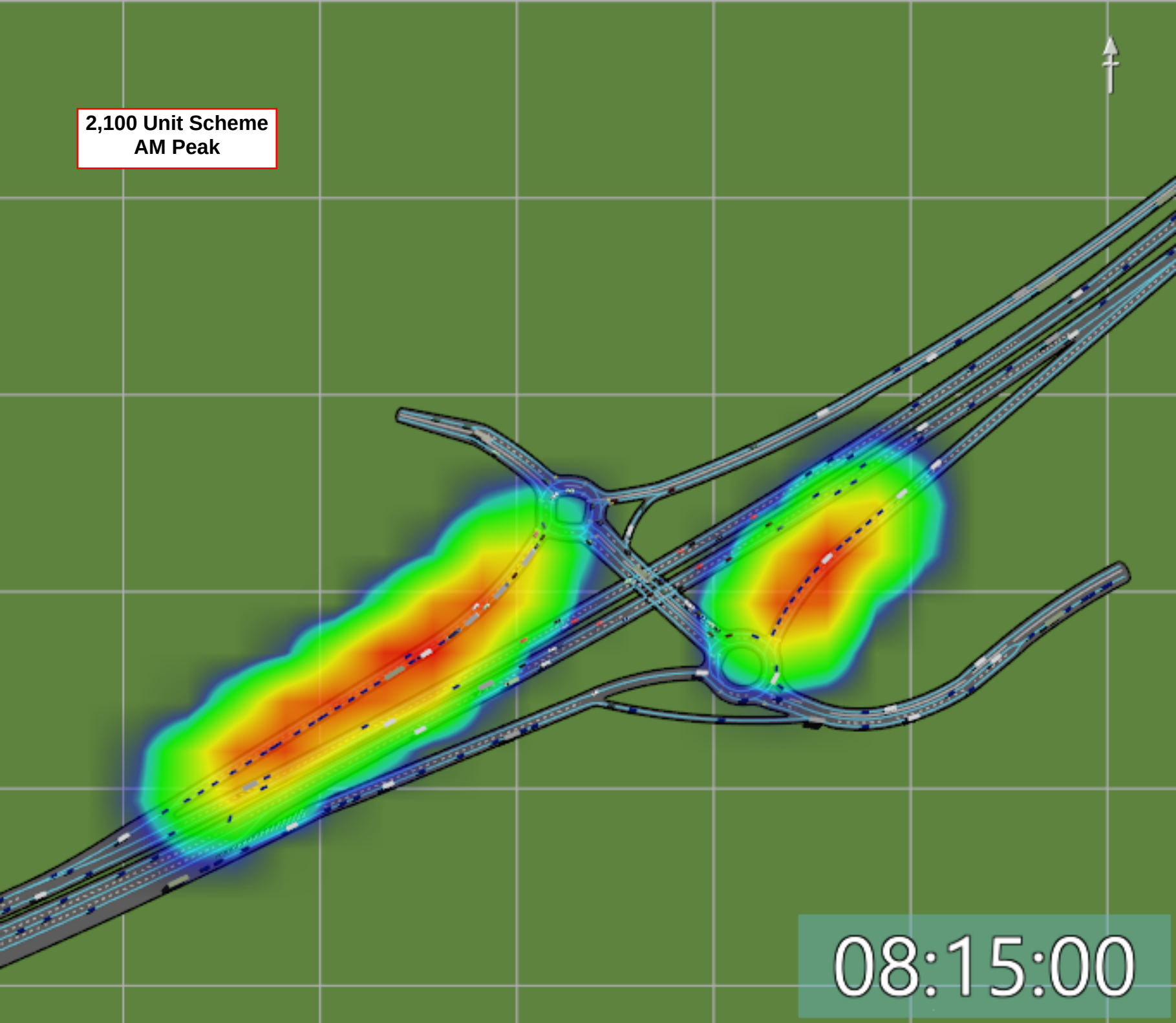
Appendix 3: Paramics Model Congestion Heat Map and Queue lengths Outputs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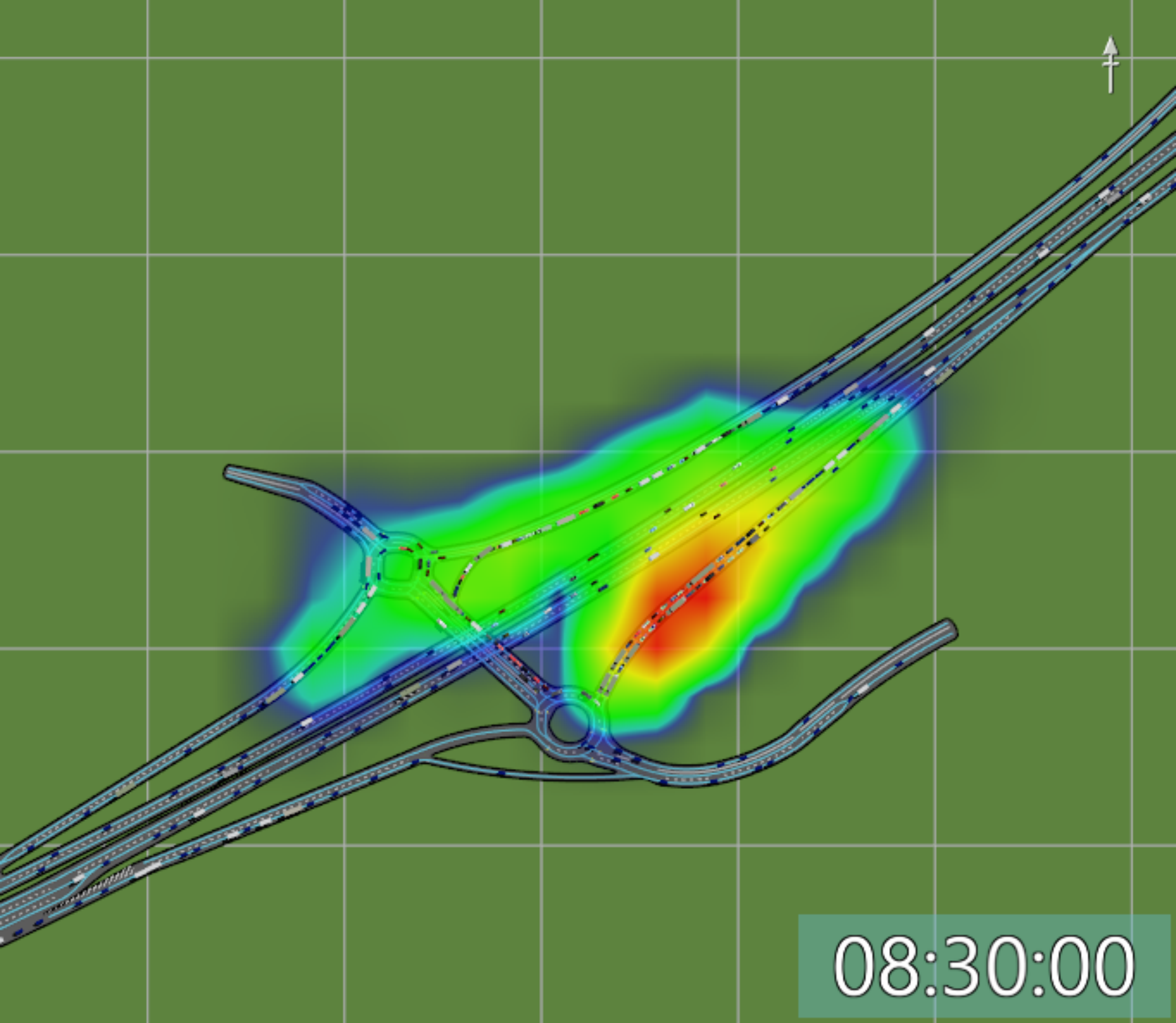
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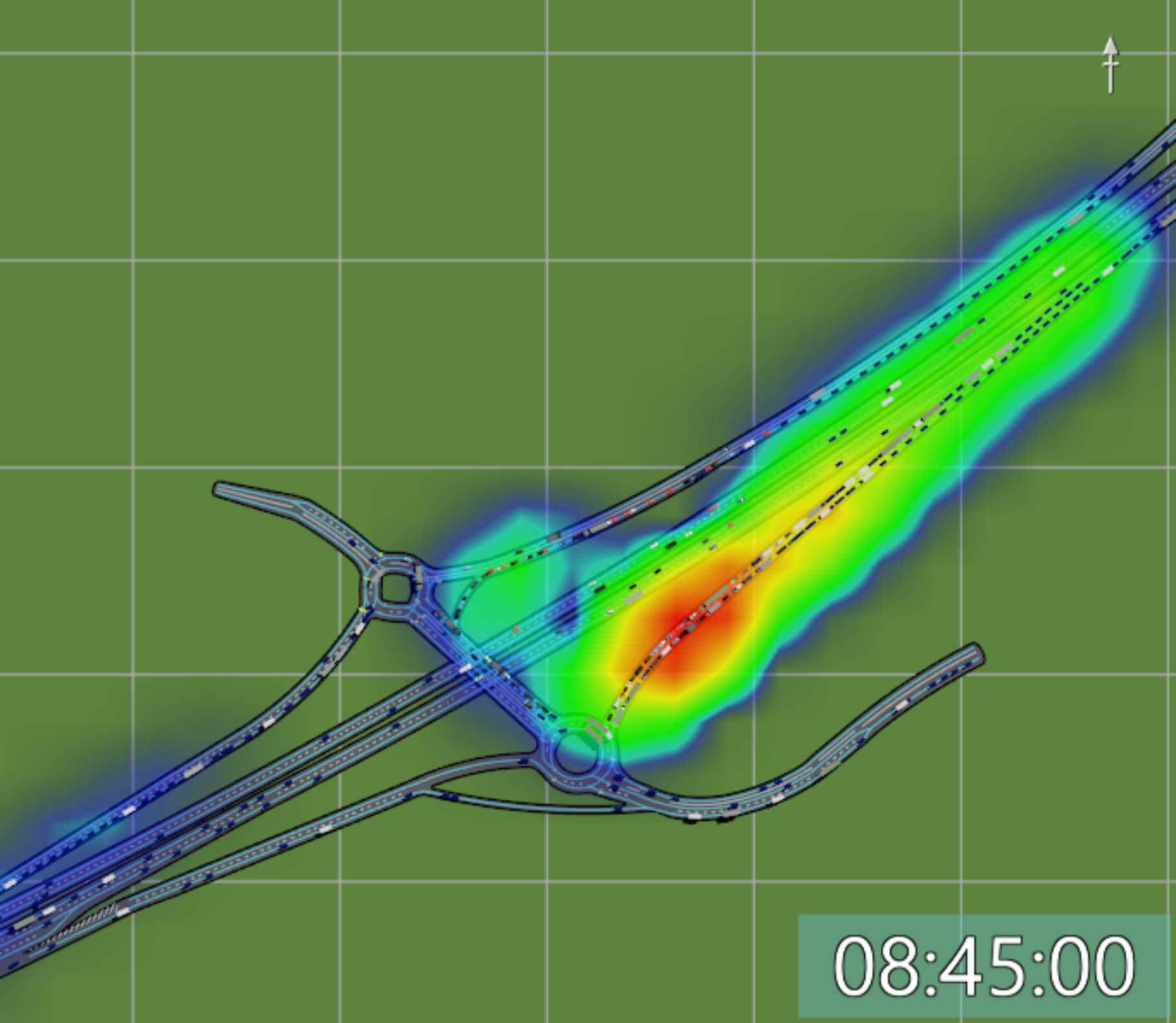
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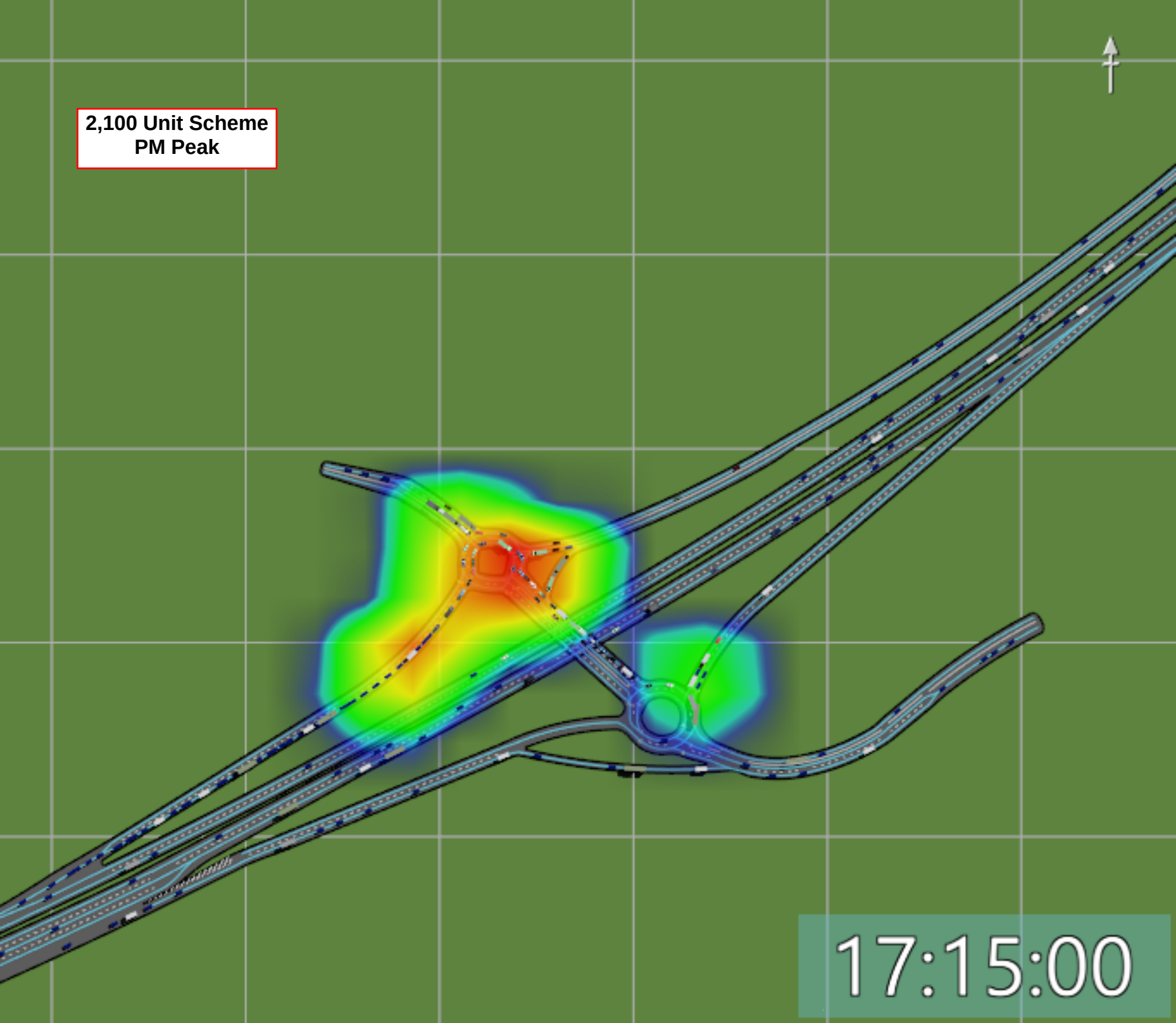
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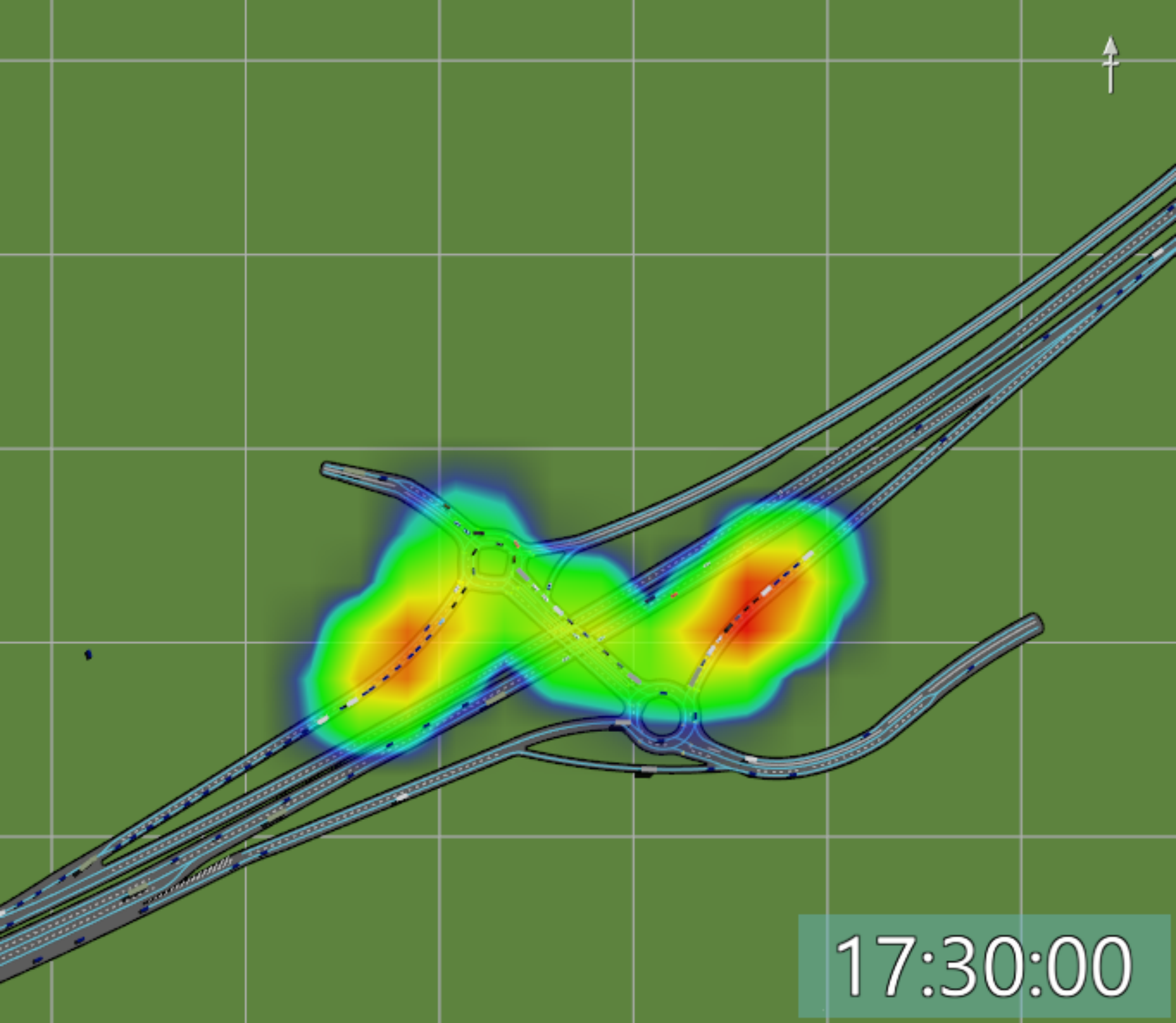
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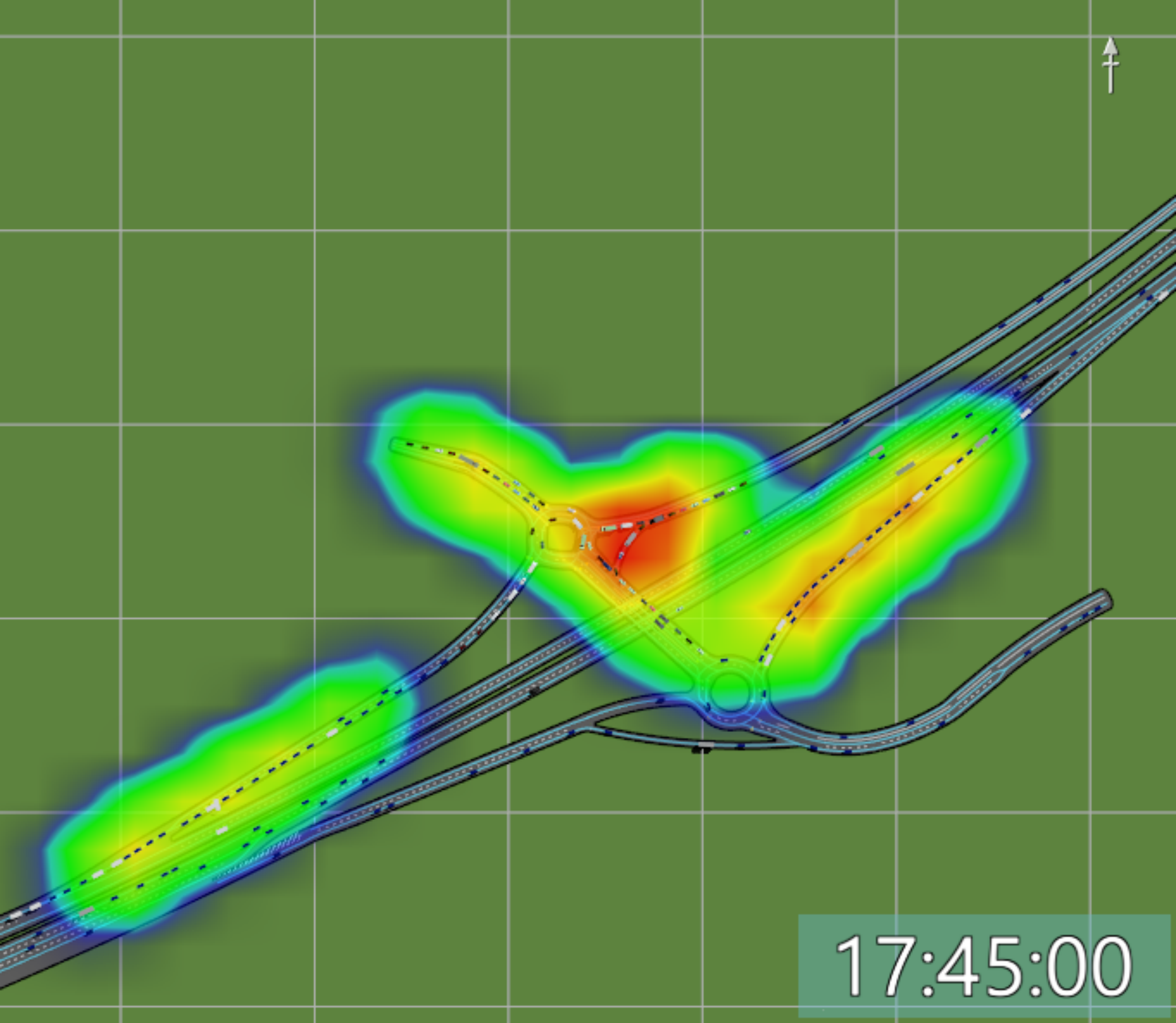
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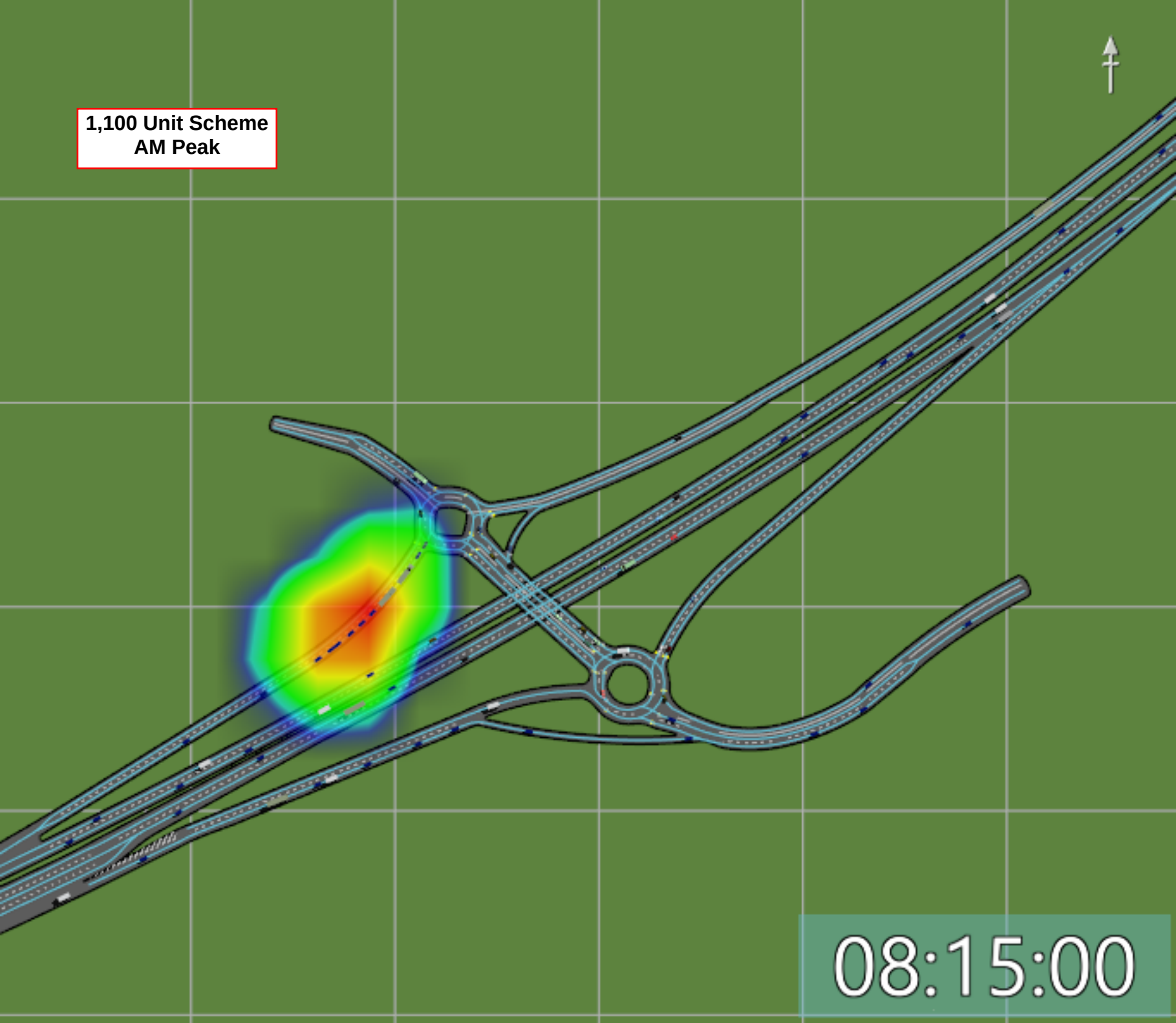
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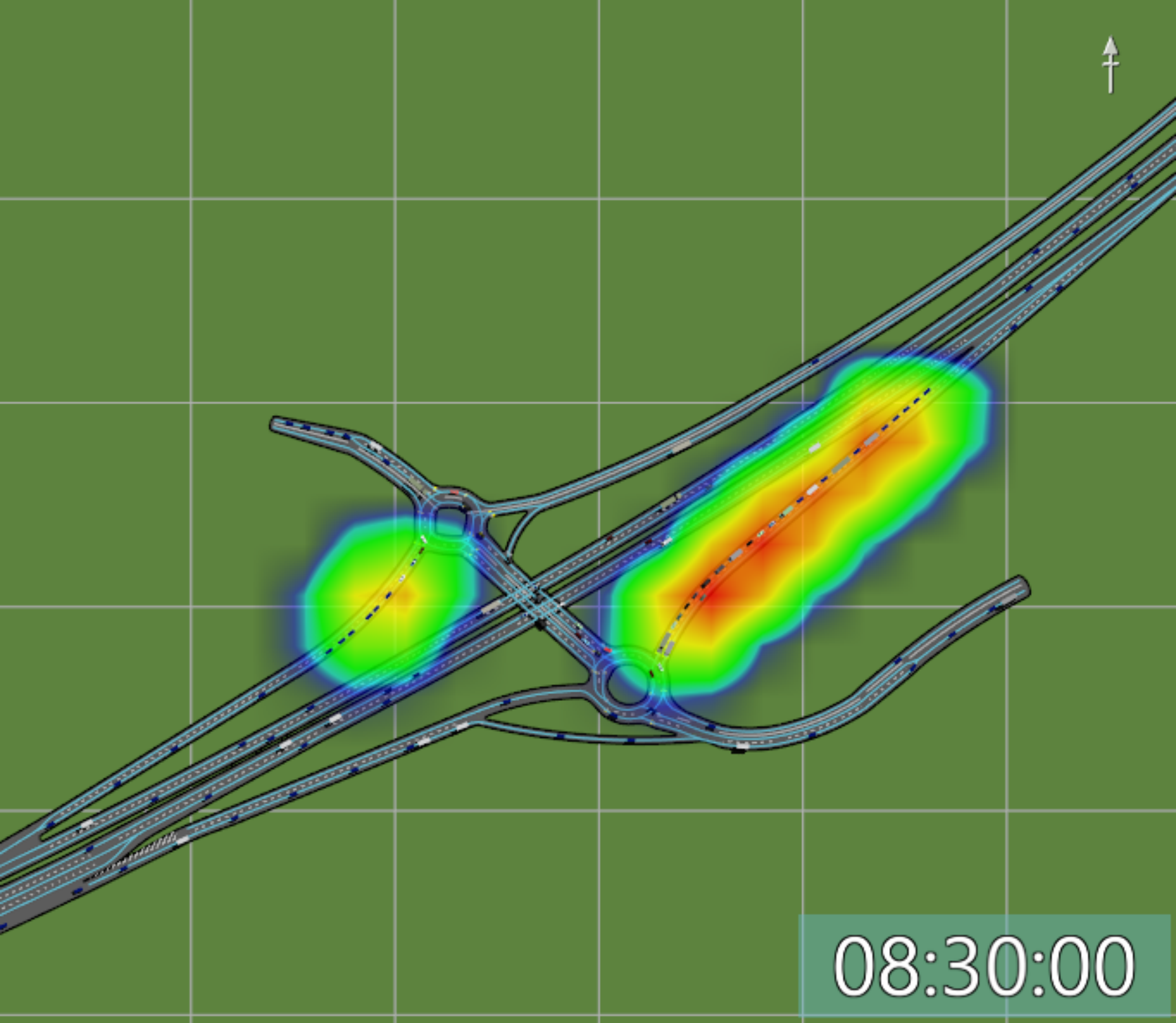
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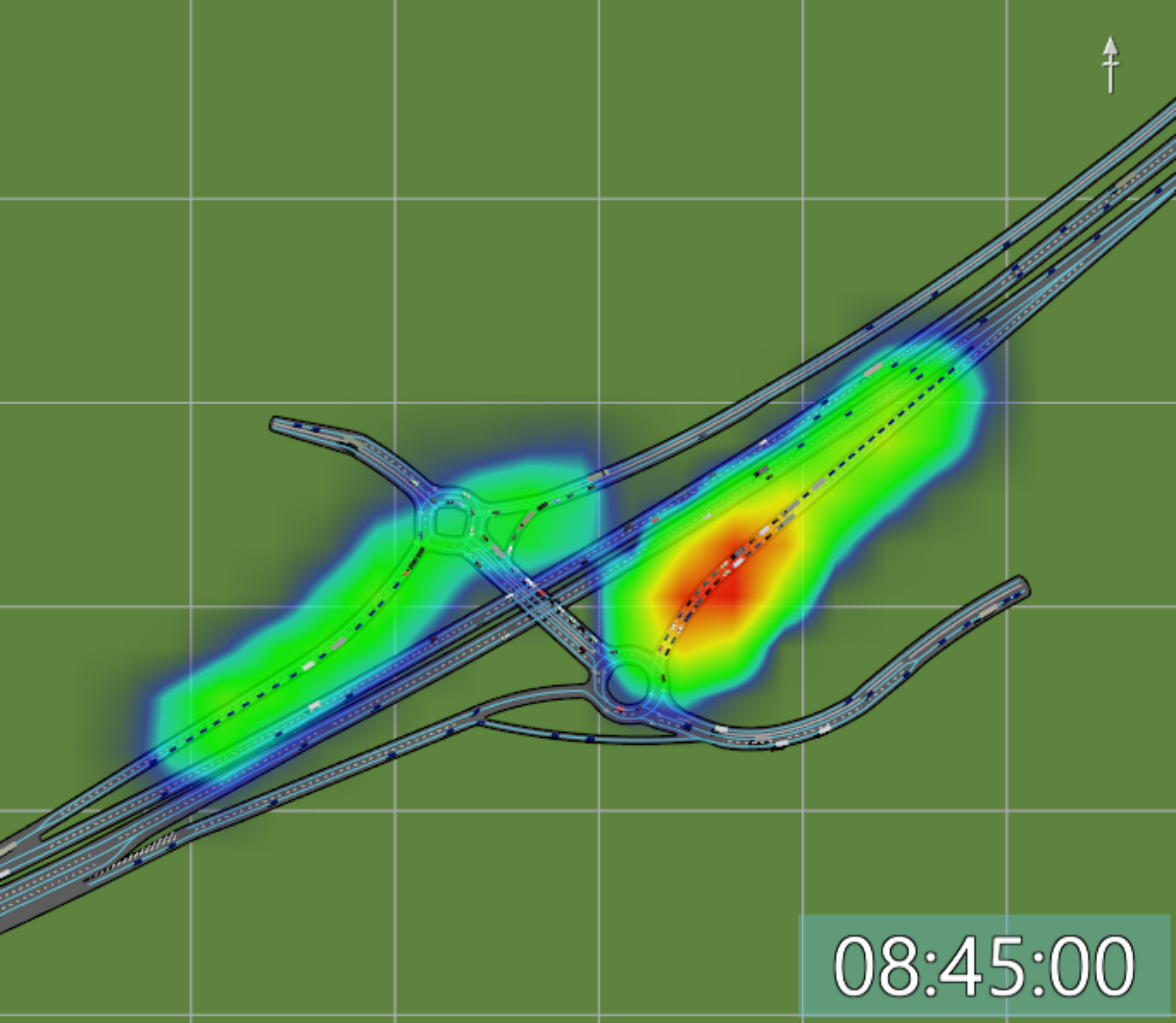
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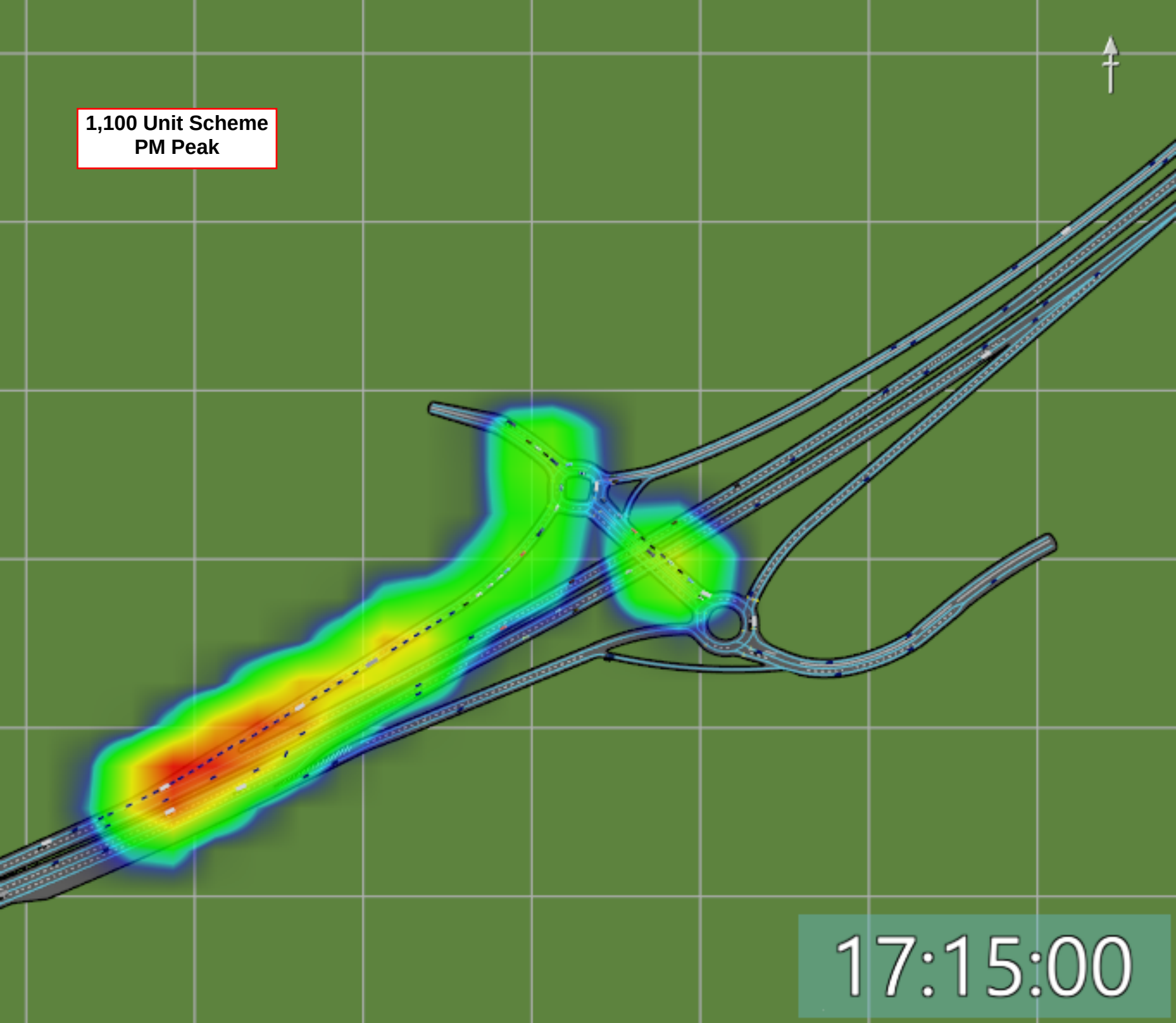
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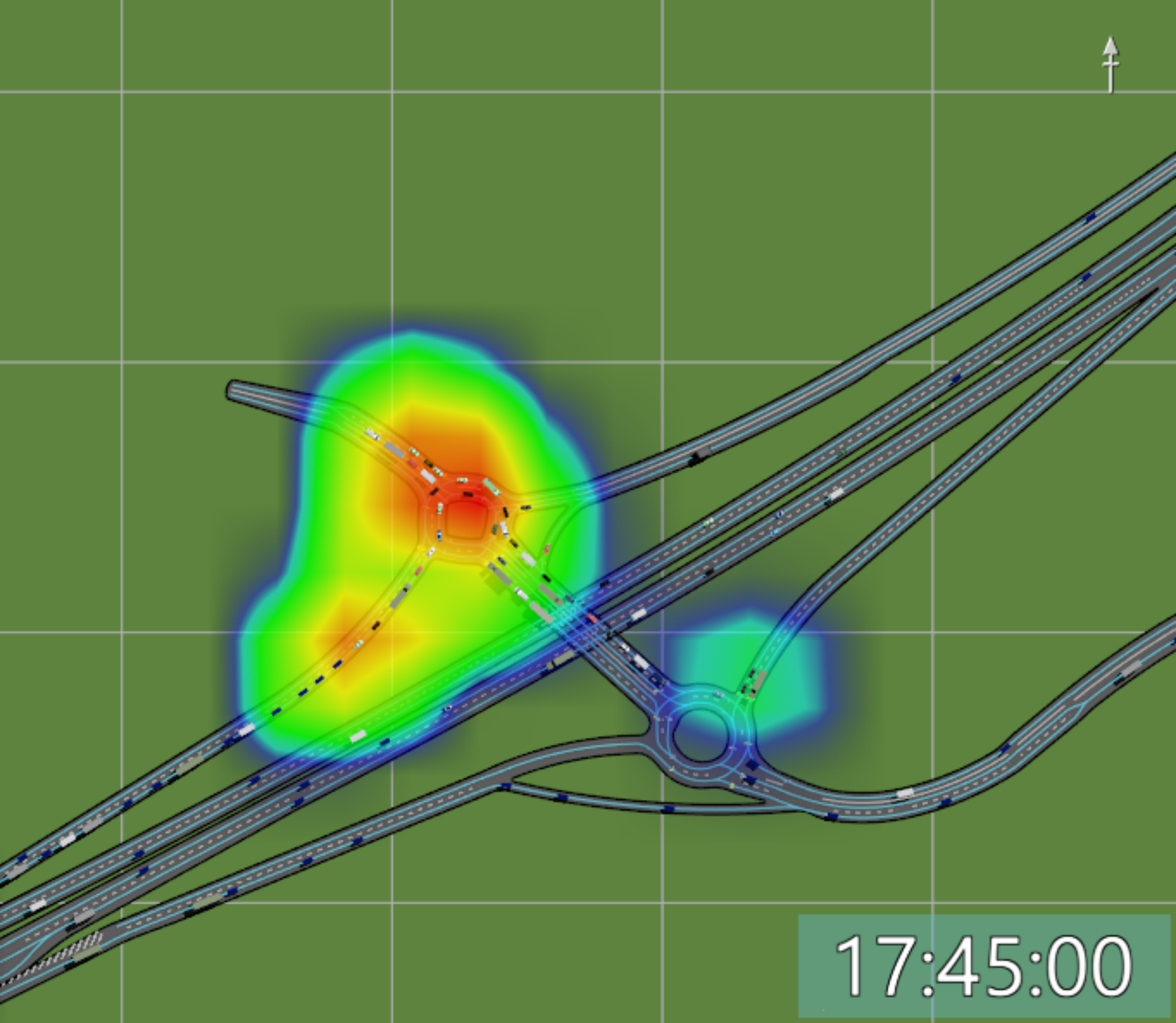
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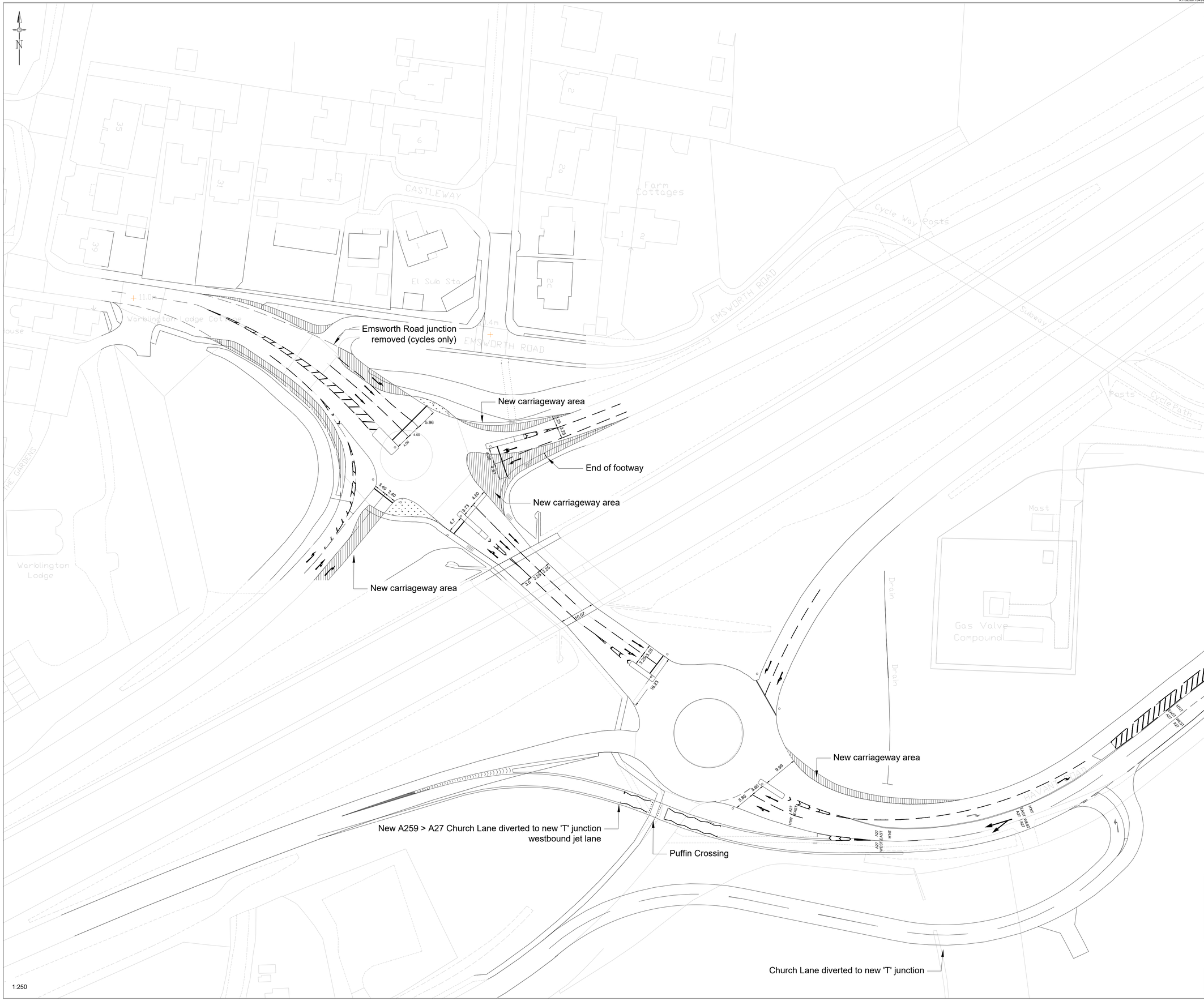
Appendix 4: Proposed Option 1B+ Layout



1:250

Notes

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3. Read this drawing with all Architect's, Service Engineer's and CampbellReith's relevant details, specifications and drawings.
4. All work is to be done in accordance with the relevant specifications issued by CampbellReith, British Standard Codes of Practice, Statutory Requirements and the Contract Documents.
5. Drawing status:

   P: Preliminary — Evolving drawings for approvals, tenders, billings etc.

   C: Construction — Fully developed drawings issued under instructions for construction.

6. Only status **C** drawings to be used for construction.
7. Suitability code:

   Work in progress
   S0 - Work in progress
   Shared (Non-contractual)
   S1 - For coordination, **S2** - For information, **S3** - For internal review and comment, **S4** - For construction approval.
   Documentation (For contractors purposes)
   D1 - For Costing, **D2** - For Tender, **D3** - For contractor design, **D4** - for manufacture/procurement.
   Construction
   A - For construction, **B** - For construction but with comments (i.e. areas in abeyance), **CR** - Construction Record (Final Construction ONLY. Any deviations to that which is on site is not the liability of CampbellReith)

Rev	Description	Date	By
P1	Issued for information	20/11/20	GJ

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Surrey 01737 784 500 ■ ☐ Birmingham 01675 467 484
Bristol 0117 916 1066 ☐ ☐ Dubai 00 971 4345 7088
www.campbellreith.com

Job Title
Transport Addendum - Part 2

Client
Havant Borough Council

Road Layout
A27 Warblington Junction

Drawn by	Date made	Scale @ A1	Checked by	Suitability	CR Project
GJ	05/11/20	1:500	CS	S2	13265

Project No.	Originator	Volume	Lvl/Loc	Type	Role	Number	Rev
13265	CRH	XX	00	DR	D	6225	P1

Appendix 5: LinSig Outputs

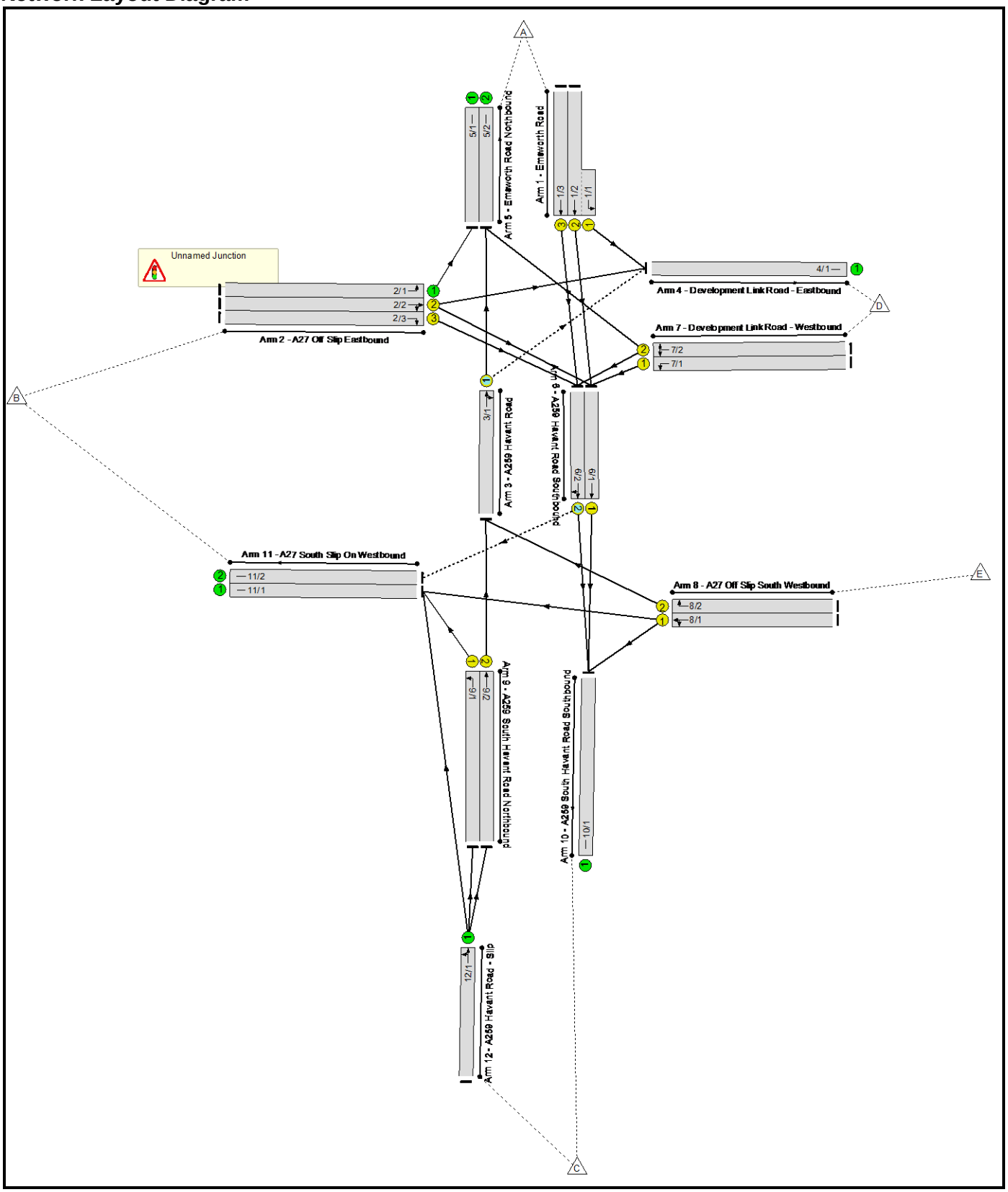
Full Input Data And Results

User and Project Details

Project:	**Havant Borough Council**
Title:	**Linsig Report A27 Signal Junction**
Location:	Warblington Roundabout(s) / Interchange
Additional detail:	
File name:	Havant LinSig Model V4.lsg3x
Author:	GJ/CS
Company:	CampbellReith Hill LLP
Address:	Raven House, 29 Linkfield Ln, Redhill RH1 1SS

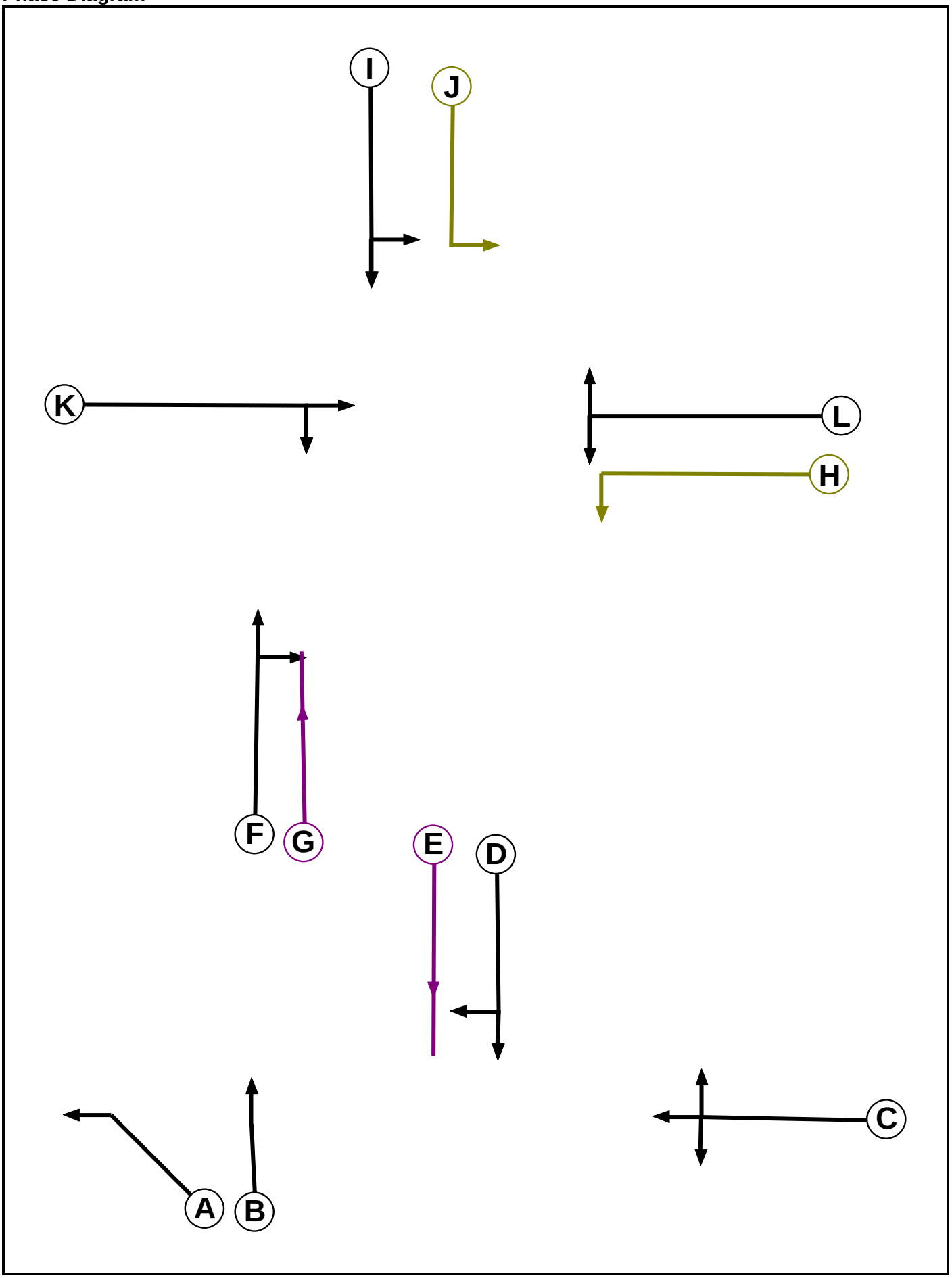
Full Input Data And Results

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	2		7	7
B	Traffic	2		7	7
C	Traffic	2		7	7
D	Traffic	2		7	7
E	Ind. Arrow	2	D	4	4
F	Traffic	1		7	7
G	Ind. Arrow	1	F	4	4
H	Filter	1	L	4	0
I	Traffic	1		7	7
J	Filter	1	I	4	4
K	Traffic	1		7	7
L	Traffic	1		7	7

Phase Intergreens Matrix

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

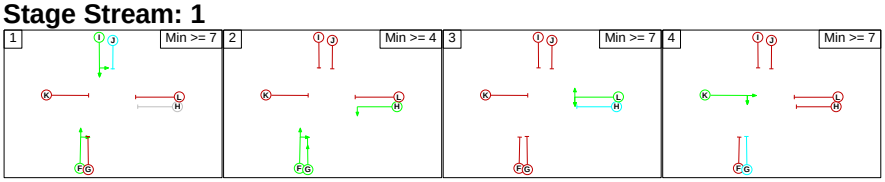
Phases in Stage

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

Full Input Data And Results

Stage Diagram

Stage Stream: 1



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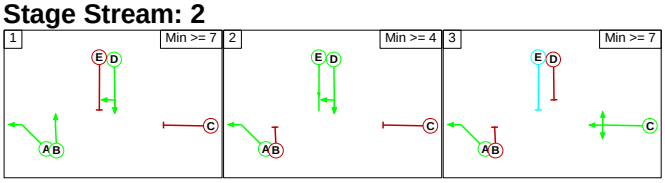


Phase Delays

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					

Prohibited Stage Change

Stage Stream: 1

From Stage \ To Stage	1	2	3	4
1		5	5	5
2	X		5	X
3	5	5		5
4	5	X	5	

Stage Stream: 2

From Stage \ To Stage	1	2	3
1		5	5
2	5		5
3	5	X	

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)
3/1 (A259 Havant Road)	4/1 (Right)	1439	0	1/2	1.09	All	-	-	-	-	-
				1/3	1.09	All					
6/2 (A259 Havant Road Southbound)	11/2 (Right)	1439	0	9/2	1.09	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 (Emsworth Road)	U	I J	2	3	5.0	Geom	-	3.25	0.00	Y	Arm 4 Left	Inf
1/2 (Emsworth Road)	U	I	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 6 Ahead	Inf
1/3 (Emsworth Road)	U	I	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 6 Ahead	Inf
2/1 (A27 Off Slip Eastbound)	U		2	3	60.0	Geom	-	3.50	0.00	Y	Arm 5 Left	15.00
2/2 (A27 Off Slip Eastbound)	U	K	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 4 Ahead Arm 6 Right	Inf Inf
2/3 (A27 Off Slip Eastbound)	U	K	2	3	60.0	Geom	-	3.50	0.00	Y	Arm 6 Right	15.00
3/1 (A259 Havant Road)	O	F	2	3	60.0	Geom	-	5.00	0.00	Y	Arm 4 Right Arm 5 Ahead	Inf Inf
4/1 (Development Link Road - Eastbound)	U		2	3	60.0	Inf	-	-	-	-	-	-
5/1 (Emsworth Road Northbound)	U		2	3	60.0	Inf	-	-	-	-	-	-
5/2 (Emsworth Road Northbound)	U		2	3	60.0	Inf	-	-	-	-	-	-
6/1 (A259 Havant Road Southbound)	U	D	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 10 Ahead	Inf
6/2 (A259 Havant Road Southbound)	O	D	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 10 Ahead Arm 11 Right	Inf Inf
7/1 (Development Link Road - Westbound)	U	L H	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 6 Left	Inf
7/2 (Development Link Road - Westbound)	U	L	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 5 Right Arm 6 Left	15.00 Inf
8/1 (A27 Off Slip	U	C	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 10 Left	15.00

South Westbound)											Arm 11 Ahead	Inf
8/2 (A27 Off Slip South Westbound)	U	C	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 3 Right	15.00
9/1 (A259 South Havant Road Northbound)	U	A	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 11 Left	Inf
9/2 (A259 South Havant Road Northbound)	U	B	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 3 Ahead	Inf
10/1 (A259 South Havant Road Southbound)	U		2	3	60.0	Inf	-	-	-	-	-	-
11/1 (A27 South Slip On Westbound)	U		2	3	60.0	Inf	-	-	-	-	-	-
11/2 (A27 South Slip On Westbound)	U		2	3	60.0	Inf	-	-	-	-	-	-
12/1 (A259 Havant Road - Slip)	U		2	3	60.0	User	1800	-	-	-	-	-

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2100 Unit AM '	08:00	09:00	01:00	
2: '2100 Unit PM'	17:00	18:00	01:00	
3: '1100 Units PM'	17:00	18:00	01:00	
4: '1100 Units AM'	08:00	09:00	01:00	

Scenario 1: '2100 Units AM Peak' (FG1: '2100 Unit AM ', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination					
		A	B	C	D	E	Tot.
Origin	A	0	198	130	206	0	534
	B	55	0	610	77	0	742
	C	167	1119	0	38	0	1324
	D	45	263	38	0	0	346
	E	175	0	25	22	0	222
	Tot.	442	1580	803	343	0	3168

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 1: 2100 Units AM Peak
Junction: Unnamed Junction	
1/1 (short)	206
1/2 (with short)	336(In) 130(Out)
1/3	198
2/1	55
2/2	256
2/3	431
3/1	402
4/1	343
5/1	55
5/2	387
6/1	347
6/2	892
7/1	38
7/2	308
8/1	25
8/2	197
9/1	0
9/2	205
10/1	803
11/1	1119
11/2	461
12/1	1324

Full Input Data And Results

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 (Emsworth Road)	3.25	0.00	Y	Arm 4 Left	Inf	100.0 %	1940	1940
1/2 (Emsworth Road)	3.25	0.00	Y	Arm 6 Ahead	Inf	100.0 %	1940	1940
1/3 (Emsworth Road)	3.25	0.00	Y	Arm 6 Ahead	Inf	100.0 %	1940	1940
2/1 (A27 Off Slip Eastbound)	3.50	0.00	Y	Arm 5 Left	15.00	100.0 %	1786	1786
2/2 (A27 Off Slip Eastbound)	3.25	0.00	Y	Arm 4 Ahead	Inf	30.1 %	1940	1940
				Arm 6 Right	Inf	69.9 %		
2/3 (A27 Off Slip Eastbound)	3.50	0.00	Y	Arm 6 Right	15.00	100.0 %	1786	1786
3/1 (A259 Havant Road)	5.00	0.00	Y	Arm 4 Right	Inf	14.9 %	2115	2115
				Arm 5 Ahead	Inf	85.1 %		
4/1 (Development Link Road - Eastbound Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Emsworth Road Northbound Lane 1)	Infinite Saturation Flow						Inf	Inf
5/2 (Emsworth Road Northbound Lane 2)	Infinite Saturation Flow						Inf	Inf
6/1 (A259 Havant Road Southbound)	3.25	0.00	Y	Arm 10 Ahead	Inf	100.0 %	1940	1940
6/2 (A259 Havant Road Southbound)	3.25	0.00	Y	Arm 10 Ahead	Inf	48.3 %	1940	1940
				Arm 11 Right	Inf	51.7 %		
7/1 (Development Link Road - Westbound)	3.25	0.00	Y	Arm 6 Left	Inf	100.0 %	1940	1940
7/2 (Development Link Road - Westbound)	3.25	0.00	Y	Arm 5 Right	15.00	14.6 %	1912	1912
				Arm 6 Left	Inf	85.4 %		
8/1 (A27 Off Slip South Westbound)	3.25	0.00	Y	Arm 10 Left	15.00	100.0 %	1764	1764
				Arm 11 Ahead	Inf	0.0 %		
8/2 (A27 Off Slip South Westbound)	3.25	0.00	Y	Arm 3 Right	15.00	100.0 %	1764	1764
9/1 (A259 South Havant Road Northbound)	3.25	0.00	Y	Arm 11 Left	Inf	0.0 %	1940	1940
9/2 (A259 South Havant Road Northbound)	3.25	0.00	Y	Arm 3 Ahead	Inf	100.0 %	1940	1940

10/1 (A259 South Havant Road Southbound Lane 1)	Infinite Saturation Flow	Inf	Inf
11/1 (A27 South Slip On Westbound Lane 1)	Infinite Saturation Flow	Inf	Inf
11/2 (A27 South Slip On Westbound Lane 2)	Infinite Saturation Flow	Inf	Inf
12/1 (A259 Havant Road - Slip Lane 1)	This lane uses a directly entered Saturation Flow	1800	1800

Scenario 2: '2100 Units PM Peak' (FG2: '2100 Unit PM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination					
		A	B	C	D	E	Tot.
Origin	A	0	208	92	169	0	469
	B	78	0	1275	251	0	1604
	C	48	928	0	56	0	1032
	D	18	102	15	0	0	135
	E	25	0	25	72	0	122
	Tot.	169	1238	1407	548	0	3362

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 2: 2100 Units PM Peak
Junction: Unnamed Junction	
1/1 (short)	169
1/2 (with short)	261(In) 92(Out)
1/3	208
2/1	78
2/2	736
2/3	790
3/1	201
4/1	548
5/1	78
5/2	91
6/1	592
6/2	1100
7/1	15
7/2	120
8/1	25
8/2	97
9/1	0
9/2	104
10/1	1407
11/1	928
11/2	310
12/1	1032

Full Input Data And Results

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 (Emsworth Road)	3.25	0.00	Y	Arm 4 Left	Inf	100.0 %	1940	1940
1/2 (Emsworth Road)	3.25	0.00	Y	Arm 6 Ahead	Inf	100.0 %	1940	1940
1/3 (Emsworth Road)	3.25	0.00	Y	Arm 6 Ahead	Inf	100.0 %	1940	1940
2/1 (A27 Off Slip Eastbound)	3.50	0.00	Y	Arm 5 Left	15.00	100.0 %	1786	1786
2/2 (A27 Off Slip Eastbound)	3.25	0.00	Y	Arm 4 Ahead	Inf	34.1 %	1940	1940
				Arm 6 Right	Inf	65.9 %		
2/3 (A27 Off Slip Eastbound)	3.50	0.00	Y	Arm 6 Right	15.00	100.0 %	1786	1786
3/1 (A259 Havant Road)	5.00	0.00	Y	Arm 4 Right	Inf	63.7 %	2115	2115
				Arm 5 Ahead	Inf	36.3 %		
4/1 (Development Link Road - Eastbound Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Emsworth Road Northbound Lane 1)	Infinite Saturation Flow						Inf	Inf
5/2 (Emsworth Road Northbound Lane 2)	Infinite Saturation Flow						Inf	Inf
6/1 (A259 Havant Road Southbound)	3.25	0.00	Y	Arm 10 Ahead	Inf	100.0 %	1940	1940
6/2 (A259 Havant Road Southbound)	3.25	0.00	Y	Arm 10 Ahead	Inf	71.8 %	1940	1940
				Arm 11 Right	Inf	28.2 %		
7/1 (Development Link Road - Westbound)	3.25	0.00	Y	Arm 6 Left	Inf	100.0 %	1940	1940
7/2 (Development Link Road - Westbound)	3.25	0.00	Y	Arm 5 Right	15.00	15.0 %	1911	1911
				Arm 6 Left	Inf	85.0 %		
8/1 (A27 Off Slip South Westbound)	3.25	0.00	Y	Arm 10 Left	15.00	100.0 %	1764	1764
				Arm 11 Ahead	Inf	0.0 %		
8/2 (A27 Off Slip South Westbound)	3.25	0.00	Y	Arm 3 Right	15.00	100.0 %	1764	1764
9/1 (A259 South Havant Road Northbound)	3.25	0.00	Y	Arm 11 Left	Inf	0.0 %	1940	1940
9/2 (A259 South Havant Road Northbound)	3.25	0.00	Y	Arm 3 Ahead	Inf	100.0 %	1940	1940

10/1 (A259 South Havant Road Southbound Lane 1)	Infinite Saturation Flow	Inf	Inf
11/1 (A27 South Slip On Westbound Lane 1)	Infinite Saturation Flow	Inf	Inf
11/2 (A27 South Slip On Westbound Lane 2)	Infinite Saturation Flow	Inf	Inf
12/1 (A259 Havant Road - Slip Lane 1)	This lane uses a directly entered Saturation Flow	1800	1800

Scenario 3: '1100 Units AM Peak' (FG4: '1100 Units AM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination					
		A	B	C	D	E	Tot.
Origin	A	0	198	130	209	0	537
	B	55	0	610	46	0	711
	C	167	1119	0	26	0	1312
	D	38	152	19	0	0	209
	E	175	0	25	18	0	218
	Tot.	435	1469	784	299	0	2987

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 3: 1100 Units AM Peak
Junction: Unnamed Junction	
1/1 (short)	209
1/2 (with short)	339(In) 130(Out)
1/3	198
2/1	55
2/2	235
2/3	421
3/1	386
4/1	299
5/1	55
5/2	380
6/1	338
6/2	771
7/1	19
7/2	190
8/1	25
8/2	193
9/1	0
9/2	193
10/1	784
11/1	1119
11/2	350
12/1	1312

Full Input Data And Results

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 (Emsworth Road)	3.25	0.00	Y	Arm 4 Left	Inf	100.0 %	1940	1940
1/2 (Emsworth Road)	3.25	0.00	Y	Arm 6 Ahead	Inf	100.0 %	1940	1940
1/3 (Emsworth Road)	3.25	0.00	Y	Arm 6 Ahead	Inf	100.0 %	1940	1940
2/1 (A27 Off Slip Eastbound)	3.50	0.00	Y	Arm 5 Left	15.00	100.0 %	1786	1786
2/2 (A27 Off Slip Eastbound)	3.25	0.00	Y	Arm 4 Ahead	Inf	19.6 %	1940	1940
				Arm 6 Right	Inf	80.4 %		
2/3 (A27 Off Slip Eastbound)	3.50	0.00	Y	Arm 6 Right	15.00	100.0 %	1786	1786
3/1 (A259 Havant Road)	5.00	0.00	Y	Arm 4 Right	Inf	11.4 %	2115	2115
				Arm 5 Ahead	Inf	88.6 %		
4/1 (Development Link Road - Eastbound Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Emsworth Road Northbound Lane 1)	Infinite Saturation Flow						Inf	Inf
5/2 (Emsworth Road Northbound Lane 2)	Infinite Saturation Flow						Inf	Inf
6/1 (A259 Havant Road Southbound)	3.25	0.00	Y	Arm 10 Ahead	Inf	100.0 %	1940	1940
6/2 (A259 Havant Road Southbound)	3.25	0.00	Y	Arm 10 Ahead	Inf	54.6 %	1940	1940
				Arm 11 Right	Inf	45.4 %		
7/1 (Development Link Road - Westbound)	3.25	0.00	Y	Arm 6 Left	Inf	100.0 %	1940	1940
7/2 (Development Link Road - Westbound)	3.25	0.00	Y	Arm 5 Right	15.00	20.0 %	1902	1902
				Arm 6 Left	Inf	80.0 %		
8/1 (A27 Off Slip South Westbound)	3.25	0.00	Y	Arm 10 Left	15.00	100.0 %	1764	1764
				Arm 11 Ahead	Inf	0.0 %		
8/2 (A27 Off Slip South Westbound)	3.25	0.00	Y	Arm 3 Right	15.00	100.0 %	1764	1764
9/1 (A259 South Havant Road Northbound)	3.25	0.00	Y	Arm 11 Left	Inf	0.0 %	1940	1940
9/2 (A259 South Havant Road Northbound)	3.25	0.00	Y	Arm 3 Ahead	Inf	100.0 %	1940	1940

10/1 (A259 South Havant Road Southbound Lane 1)	Infinite Saturation Flow	Inf	Inf
11/1 (A27 South Slip On Westbound Lane 1)	Infinite Saturation Flow	Inf	Inf
11/2 (A27 South Slip On Westbound Lane 2)	Infinite Saturation Flow	Inf	Inf
12/1 (A259 Havant Road - Slip Lane 1)	This lane uses a directly entered Saturation Flow	1800	1800

Scenario 4: '1100 Units AM Peak' (FG3: '1100 Units PM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination					
		A	B	C	D	E	Tot.
Origin	A	0	208	92	166	0	466
	B	78	0	1275	155	0	1508
	C	48	928	0	40	0	1016
	D	18	60	15	0	0	93
	E	25	0	25	38	0	88
	Tot.	169	1196	1407	399	0	3171

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 4: 1100 Units AM Peak
Junction: Unnamed Junction	
1/1 (short)	166
1/2 (with short)	258(In) 92(Out)
1/3	208
2/1	78
2/2	655
2/3	775
3/1	151
4/1	399
5/1	78
5/2	91
6/1	607
6/2	1043
7/1	15
7/2	78
8/1	25
8/2	63
9/1	0
9/2	88
10/1	1407
11/1	928
11/2	268
12/1	1016

Full Input Data And Results

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 (Emsworth Road)	3.25	0.00	Y	Arm 4 Left	Inf	100.0 %	1940	1940
1/2 (Emsworth Road)	3.25	0.00	Y	Arm 6 Ahead	Inf	100.0 %	1940	1940
1/3 (Emsworth Road)	3.25	0.00	Y	Arm 6 Ahead	Inf	100.0 %	1940	1940
2/1 (A27 Off Slip Eastbound)	3.50	0.00	Y	Arm 5 Left	15.00	100.0 %	1786	1786
2/2 (A27 Off Slip Eastbound)	3.25	0.00	Y	Arm 4 Ahead	Inf	23.7 %	1940	1940
				Arm 6 Right	Inf	76.3 %		
2/3 (A27 Off Slip Eastbound)	3.50	0.00	Y	Arm 6 Right	15.00	100.0 %	1786	1786
3/1 (A259 Havant Road)	5.00	0.00	Y	Arm 4 Right	Inf	51.7 %	2115	2115
				Arm 5 Ahead	Inf	48.3 %		
4/1 (Development Link Road - Eastbound Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Emsworth Road Northbound Lane 1)	Infinite Saturation Flow						Inf	Inf
5/2 (Emsworth Road Northbound Lane 2)	Infinite Saturation Flow						Inf	Inf
6/1 (A259 Havant Road Southbound)	3.25	0.00	Y	Arm 10 Ahead	Inf	100.0 %	1940	1940
6/2 (A259 Havant Road Southbound)	3.25	0.00	Y	Arm 10 Ahead	Inf	74.3 %	1940	1940
				Arm 11 Right	Inf	25.7 %		
7/1 (Development Link Road - Westbound)	3.25	0.00	Y	Arm 6 Left	Inf	100.0 %	1940	1940
7/2 (Development Link Road - Westbound)	3.25	0.00	Y	Arm 5 Right	15.00	23.1 %	1896	1896
				Arm 6 Left	Inf	76.9 %		
8/1 (A27 Off Slip South Westbound)	3.25	0.00	Y	Arm 10 Left	15.00	100.0 %	1764	1764
				Arm 11 Ahead	Inf	0.0 %		
8/2 (A27 Off Slip South Westbound)	3.25	0.00	Y	Arm 3 Right	15.00	100.0 %	1764	1764
9/1 (A259 South Havant Road Northbound)	3.25	0.00	Y	Arm 11 Left	Inf	0.0 %	1940	1940
9/2 (A259 South Havant Road Northbound)	3.25	0.00	Y	Arm 3 Ahead	Inf	100.0 %	1940	1940

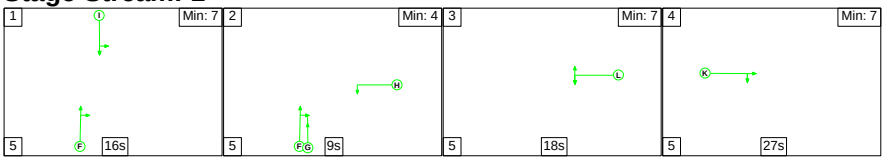
Full Input Data And Results

10/1 (A259 South Havant Road Southbound Lane 1)	Infinite Saturation Flow	Inf	Inf
11/1 (A27 South Slip On Westbound Lane 1)	Infinite Saturation Flow	Inf	Inf
11/2 (A27 South Slip On Westbound Lane 2)	Infinite Saturation Flow	Inf	Inf
12/1 (A259 Havant Road - Slip Lane 1)	This lane uses a directly entered Saturation Flow	1800	1800

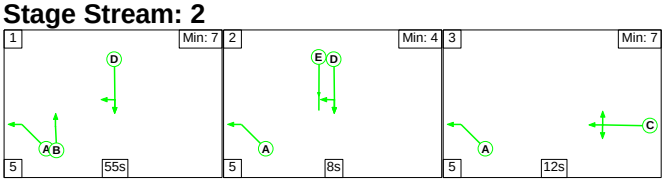
Scenario 1: '2100 Units AM Peak' (FG1: '2100 Unit AM ', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

Stage Stream: 1



Stage Stream: 2



Stage Timings

Stage Stream: 1

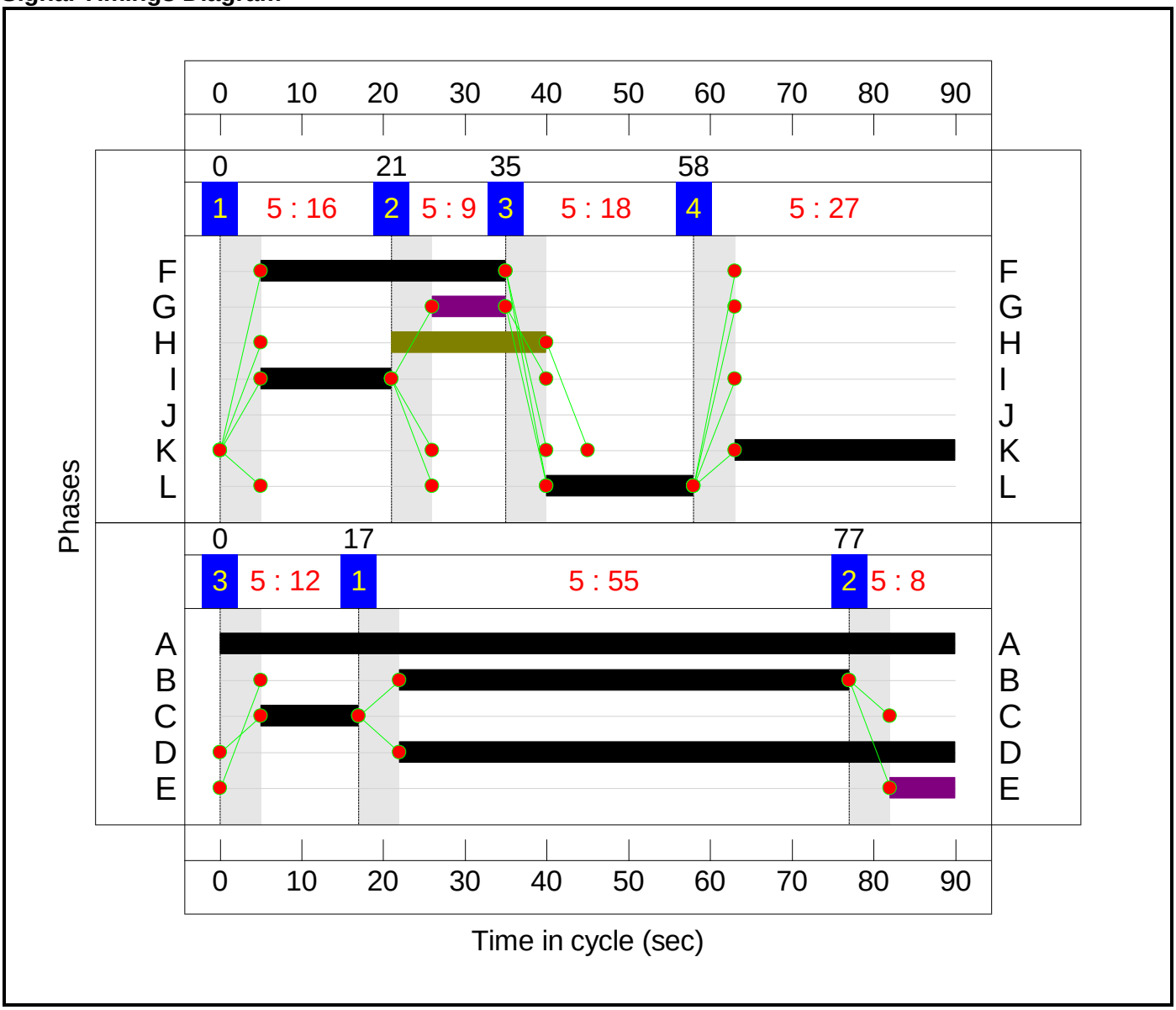
Stage	1	2	3	4
Duration	16	9	18	27
Change Point	0	21	35	58

Stage Stream: 2

Stage	1	2	3
Duration	55	8	12
Change Point	17	77	0

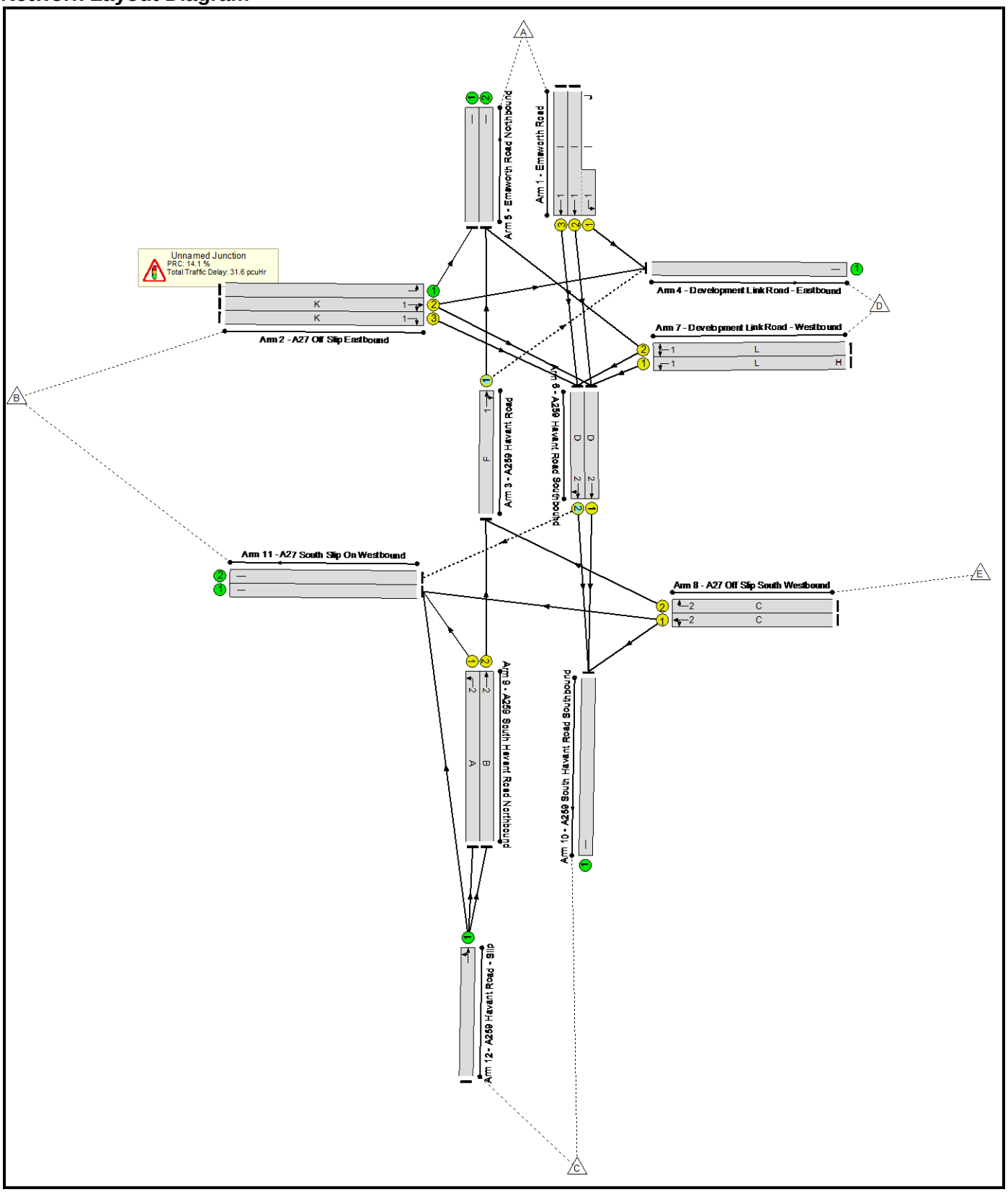
Full Input Data And Results

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	-	-	**N/A**	-	-		-	-	-	-	-	-	**78.9%**
Unnamed Junction	-	-	**N/A**	-	-		-	-	-	-	-	-	**78.9%**
1/2+1/1	Emsworth Road Left Ahead	U	1	N/A	I	J	1	16	0	336	1940:1940	193+306	67.4 : 67.4%
1/3	Emsworth Road Ahead	U	1	N/A	I		1	16	-	198	1940	366	54.0%
2/1	A27 Off Slip Eastbound Left	U	N/A	N/A	-		-	-	-	55	1786	1786	3.1%
2/2	A27 Off Slip Eastbound Ahead Right	U	1	N/A	K		1	27	-	256	1940	604	42.4%
2/3	A27 Off Slip Eastbound Right	U	1	N/A	K		1	27	-	431	1786	556	77.6%
3/1	A259 Havant Road Right Ahead	O	1	N/A	F		1	30	-	402	2115	510	78.9%
4/1	Development Link Road - Eastbound	U	N/A	N/A	-		-	-	-	343	Inf	Inf	0.0%
5/1	Emsworth Road Northbound	U	N/A	N/A	-		-	-	-	55	Inf	Inf	0.0%
5/2	Emsworth Road Northbound	U	N/A	N/A	-		-	-	-	387	Inf	Inf	0.0%
6/1	A259 Havant Road Southbound Ahead	U	2	N/A	D		1	68	-	347	1940	1487	23.3%
6/2	A259 Havant Road Southbound Ahead Right	O	2	N/A	D		1	68	-	892	1940	1137	78.5%
7/1	Development Link Road - Westbound Left	U	1	N/A	L	H	1	37	19	38	1940	819	4.6%
7/2	Development Link Road - Westbound Right Left	U	1	N/A	L		1	18	-	308	1912	404	76.3%
8/1	A27 Off Slip South Westbound Left Ahead	U	2	N/A	C		1	12	-	25	1764	255	9.8%

Full Input Data And Results

8/2	A27 Off Slip South Westbound Right	U	2	N/A	C		1	12	-	197	1764	255	77.3%
9/1	A259 South Havant Road Northbound Left	U	2	N/A	A		1	90	-	0	1940	1940	0.0%
9/2	A259 South Havant Road Northbound Ahead	U	2	N/A	B		1	55	-	205	1940	1207	17.0%
10/1	A259 South Havant Road Southbound	U	N/A	N/A	-		-	-	-	803	Inf	Inf	0.0%
11/1	A27 South Slip On Westbound	U	N/A	N/A	-		-	-	-	1119	Inf	Inf	0.0%
11/2	A27 South Slip On Westbound	U	N/A	N/A	-		-	-	-	461	Inf	Inf	0.0%
12/1	A259 Havant Road - Slip Ahead Left	U	N/A	N/A	-		-	-	-	1324	1800	1800	73.6%

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	**-**	**-**	**488**	**33**	**0**	**19.5**	**12.2**	**0.0**	**31.6**	**-**	**-**	**-**	**-**
Unnamed Junction	**-**	**-**	**488**	**33**	**0**	**19.5**	**12.2**	**0.0**	**31.6**	**-**	**-**	**-**	**-**
1/2+1/1	336	336	-	-	-	3.0	1.0	-	4.1	43.5	4.6	1.0	5.7
1/3	198	198	-	-	-	1.8	0.6	-	2.4	43.6	4.5	0.6	5.0
2/1	55	55	-	-	-	0.0	0.0	-	0.0	1.0	0.0	0.0	0.0
2/2	256	256	-	-	-	1.8	0.4	-	2.1	29.8	5.0	0.4	5.4
2/3	431	431	-	-	-	3.4	1.7	-	5.1	42.2	9.7	1.7	11.4
3/1	402	402	27	33	0	2.0	1.8	-	3.8	33.7	8.1	1.8	10.0
4/1	343	343	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	55	55	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/2	387	387	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	347	347	-	-	-	0.3	0.2	-	0.5	5.1	3.6	0.2	3.7
6/2	892	892	461	0	0	1.5	1.8	-	3.3	13.3	7.2	1.8	9.0
7/1	38	38	-	-	-	0.2	0.0	-	0.2	17.6	0.6	0.0	0.6
7/2	308	308	-	-	-	2.9	1.6	-	4.4	51.6	7.2	1.6	8.7
8/1	25	25	-	-	-	0.2	0.1	-	0.3	41.3	0.5	0.1	0.6
8/2	197	197	-	-	-	2.0	1.6	-	3.6	66.6	4.7	1.6	6.3
9/1	0	0	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/2	205	205	-	-	-	0.4	0.1	-	0.5	9.0	2.2	0.1	2.3
10/1	803	803	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
11/1	1119	1119	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
11/2	461	461	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
12/1	1324	1324	-	-	-	0.0	1.4	-	1.4	3.8	0.0	1.4	1.4

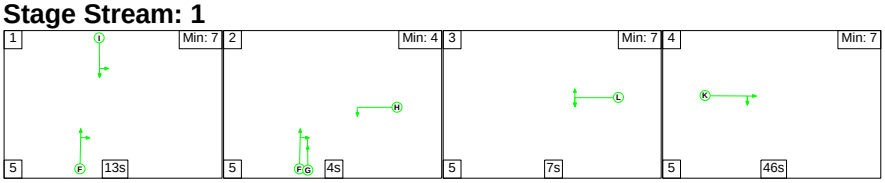
C1 Stream: 1 PRC for Signalled Lanes (%): 14.1 Total Delay for Signalled Lanes (pcuHr): 22.00 Cycle Time (s): 90
C1 Stream: 2 PRC for Signalled Lanes (%): 14.7 Total Delay for Signalled Lanes (pcuHr): 8.24 Cycle Time (s): 90
PRC Over All Lanes (%): 14.1 Total Delay Over All Lanes(pcuHr): 31.63

Full Input Data And Results

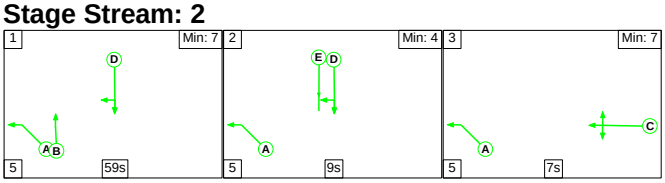
Scenario 2: '2100 Units PM Peak' (FG2: '2100 Unit PM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

Stage Stream: 1



Stage Stream: 2



Stage Timings

Stage Stream: 1

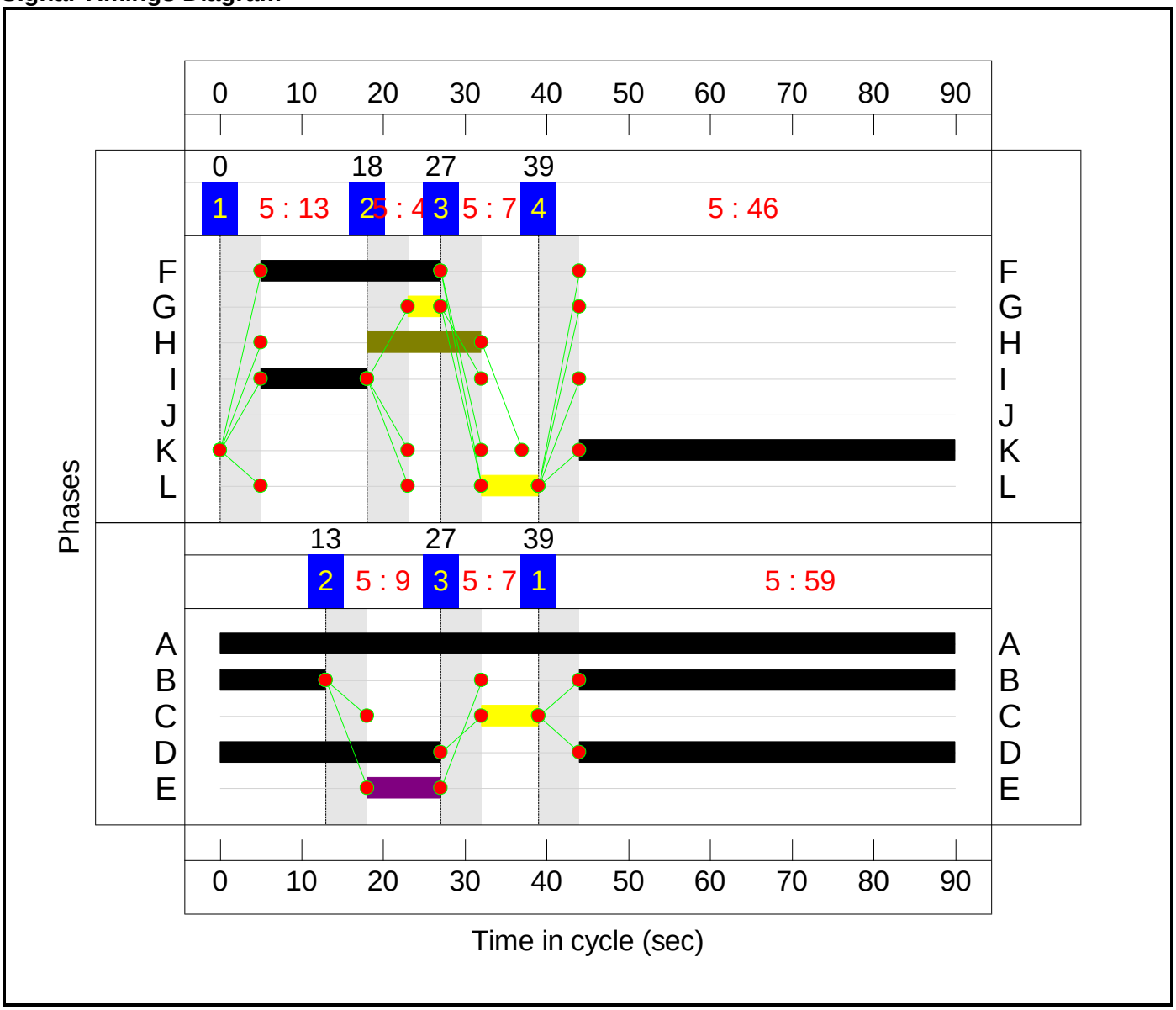
Stage	1	2	3	4
Duration	13	4	7	46
Change Point	0	18	27	39

Stage Stream: 2

Stage	1	2	3
Duration	59	9	7
Change Point	39	13	27

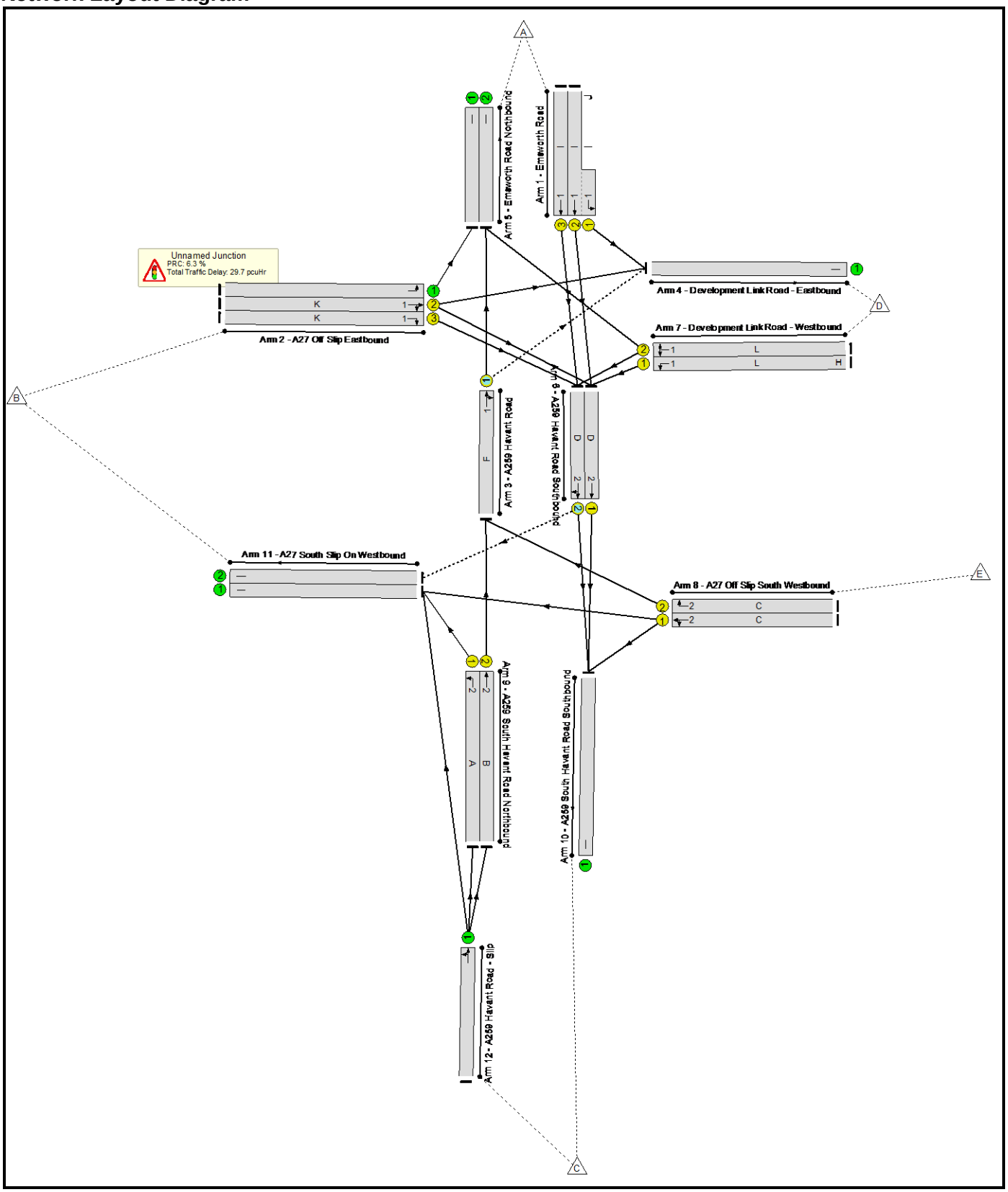
Full Input Data And Results

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	-	-	**N/A**	-	-		-	-	-	-	-	-	**84.7%**
Unnamed Junction	-	-	**N/A**	-	-		-	-	-	-	-	-	**84.7%**
1/2+1/1	Emsworth Road Left Ahead	U	1	N/A	I	J	1	13	0	261	1940:1940	147+270	62.6 : 62.6%
1/3	Emsworth Road Ahead	U	1	N/A	I		1	13	-	208	1940	302	68.9%
2/1	A27 Off Slip Eastbound Left	U	N/A	N/A	-		-	-	-	78	1786	1786	4.4%
2/2	A27 Off Slip Eastbound Ahead Right	U	1	N/A	K		1	46	-	736	1940	1013	72.6%
2/3	A27 Off Slip Eastbound Right	U	1	N/A	K		1	46	-	790	1786	933	84.7%
3/1	A259 Havant Road Right Ahead	O	1	N/A	F		1	22	-	201	2115	284	70.9%
4/1	Development Link Road - Eastbound	U	N/A	N/A	-		-	-	-	548	Inf	Inf	0.0%
5/1	Emsworth Road Northbound	U	N/A	N/A	-		-	-	-	78	Inf	Inf	0.0%
5/2	Emsworth Road Northbound	U	N/A	N/A	-		-	-	-	91	Inf	Inf	0.0%
6/1	A259 Havant Road Southbound Ahead	U	2	N/A	D		1	73	-	592	1940	1595	37.1%
6/2	A259 Havant Road Southbound Ahead Right	O	2	N/A	D		1	73	-	1100	1940	1408	78.1%
7/1	Development Link Road - Westbound Left	U	1	N/A	L	H	1	21	14	15	1940	474	3.2%
7/2	Development Link Road - Westbound Right Left	U	1	N/A	L		1	7	-	120	1911	170	70.6%
8/1	A27 Off Slip South Westbound Left Ahead	U	2	N/A	C		1	7	-	25	1764	157	15.9%

Full Input Data And Results

8/2	A27 Off Slip South Westbound Right	U	2	N/A	C		1	7	-	97	1764	157	61.9%
9/1	A259 South Havant Road Northbound Left	U	2	N/A	A		1	90	-	0	1940	-	-
9/2	A259 South Havant Road Northbound Ahead	U	2	N/A	B		1	59	-	104	1940	1293	8.0%
10/1	A259 South Havant Road Southbound	U	N/A	N/A	-		-	-	-	1407	Inf	Inf	0.0%
11/1	A27 South Slip On Westbound	U	N/A	N/A	-		-	-	-	928	Inf	Inf	0.0%
11/2	A27 South Slip On Westbound	U	N/A	N/A	-		-	-	-	310	Inf	Inf	0.0%
12/1	A259 Havant Road - Slip Ahead Left	U	N/A	N/A	-		-	-	-	1032	1800	1800	57.3%

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	**-**	**-**	**148**	**290**	**0**	**17.7**	**11.9**	**0.0**	**29.7**	**-**	**-**	**-**	**-**
Unnamed Junction	**-**	**-**	**148**	**290**	**0**	**17.7**	**11.9**	**0.0**	**29.7**	**-**	**-**	**-**	**-**
1/2+1/1	261	261	-	-	-	2.5	0.8	-	3.3	46.1	3.9	0.8	4.7
1/3	208	208	-	-	-	2.1	1.1	-	3.2	54.7	4.9	1.1	6.0
2/1	78	78	-	-	-	0.0	0.0	-	0.0	1.1	0.0	0.0	0.0
2/2	736	736	-	-	-	3.4	1.3	-	4.7	23.0	14.1	1.3	15.4
2/3	790	790	-	-	-	4.0	2.7	-	6.7	30.6	16.9	2.7	19.6
3/1	201	201	48	80	0	2.6	1.2	-	3.8	68.1	5.0	1.2	6.2
4/1	548	548	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	78	78	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/2	91	91	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	592	592	-	-	-	0.0	0.3	-	0.3	2.0	0.3	0.3	0.6
6/2	1100	1100	101	209	0	0.1	1.8	-	1.9	6.3	2.7	1.8	4.5
7/1	15	15	-	-	-	0.1	0.0	-	0.1	30.0	0.3	0.0	0.3
7/2	120	120	-	-	-	1.3	1.2	-	2.5	74.4	2.9	1.2	4.1
8/1	25	25	-	-	-	0.3	0.1	-	0.4	51.6	0.6	0.1	0.7
8/2	97	97	-	-	-	1.1	0.8	-	1.9	68.9	2.3	0.8	3.1
9/1	-	-	-	-	-	-	-	-	-	-	-	-	-
9/2	104	104	-	-	-	0.2	0.0	-	0.2	6.8	0.9	0.0	0.9
10/1	1407	1407	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
11/1	928	928	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
11/2	310	310	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
12/1	1032	1032	-	-	-	0.0	0.7	-	0.7	2.3	0.0	0.7	0.7

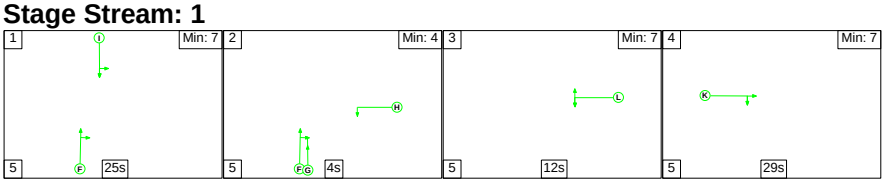
C1 Stream: 1 PRC for Signalled Lanes (%): 6.3 Total Delay for Signalled Lanes (pcuHr): 24.32 Cycle Time (s): 90
C1 Stream: 2 PRC for Signalled Lanes (%): 15.2 Total Delay for Signalled Lanes (pcuHr): 4.66 Cycle Time (s): 90
PRC Over All Lanes (%): 6.3 Total Delay Over All Lanes(pcuHr): 29.67

Full Input Data And Results

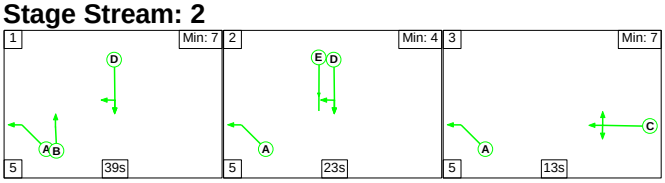
Scenario 3: '1100 Units AM Peak' (FG4: '1100 Units AM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

Stage Stream: 1



Stage Stream: 2



Stage Timings

Stage Stream: 1

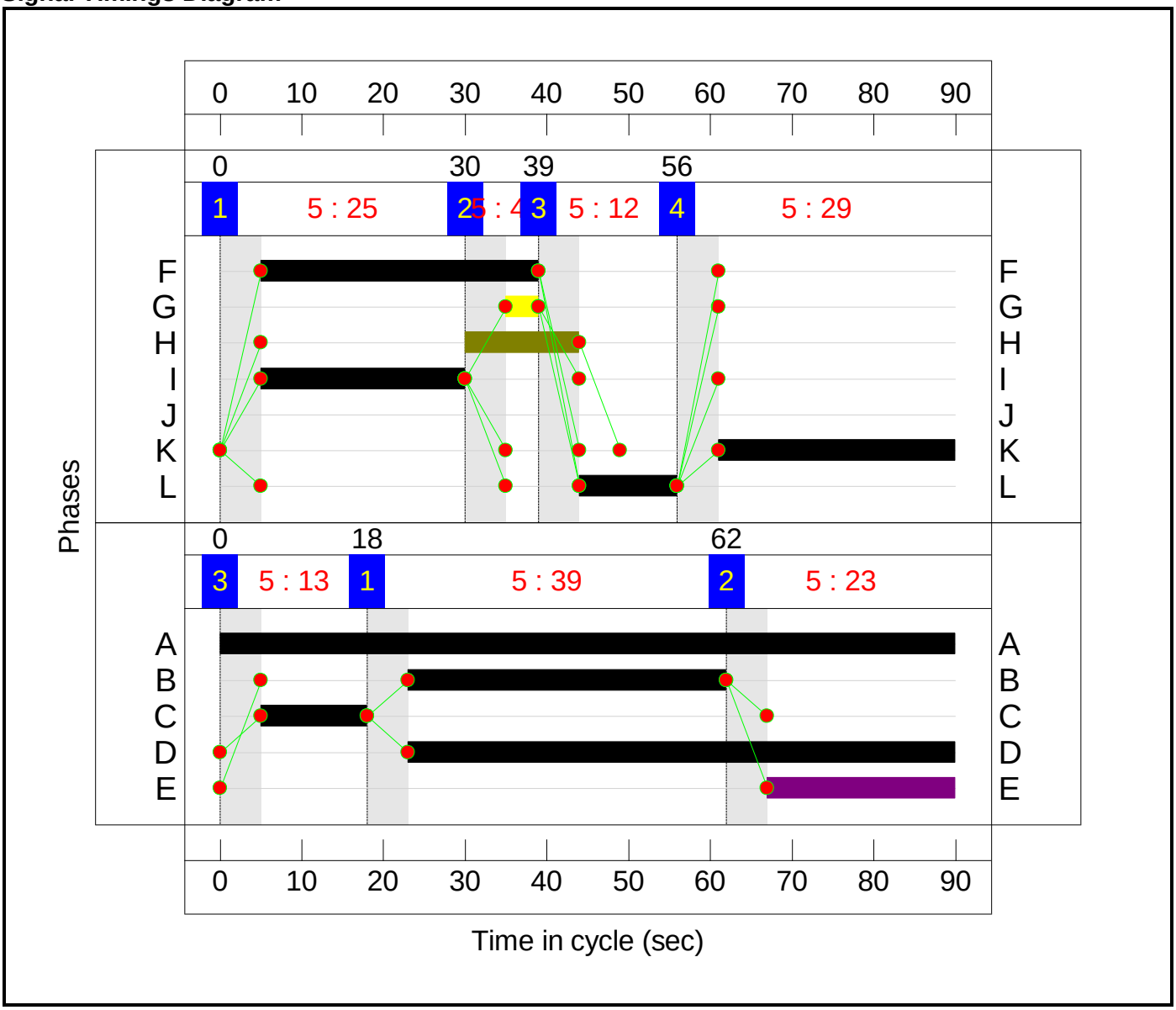
Stage	1	2	3	4
Duration	25	4	12	29
Change Point	0	30	39	56

Stage Stream: 2

Stage	1	2	3
Duration	39	23	13
Change Point	18	62	0

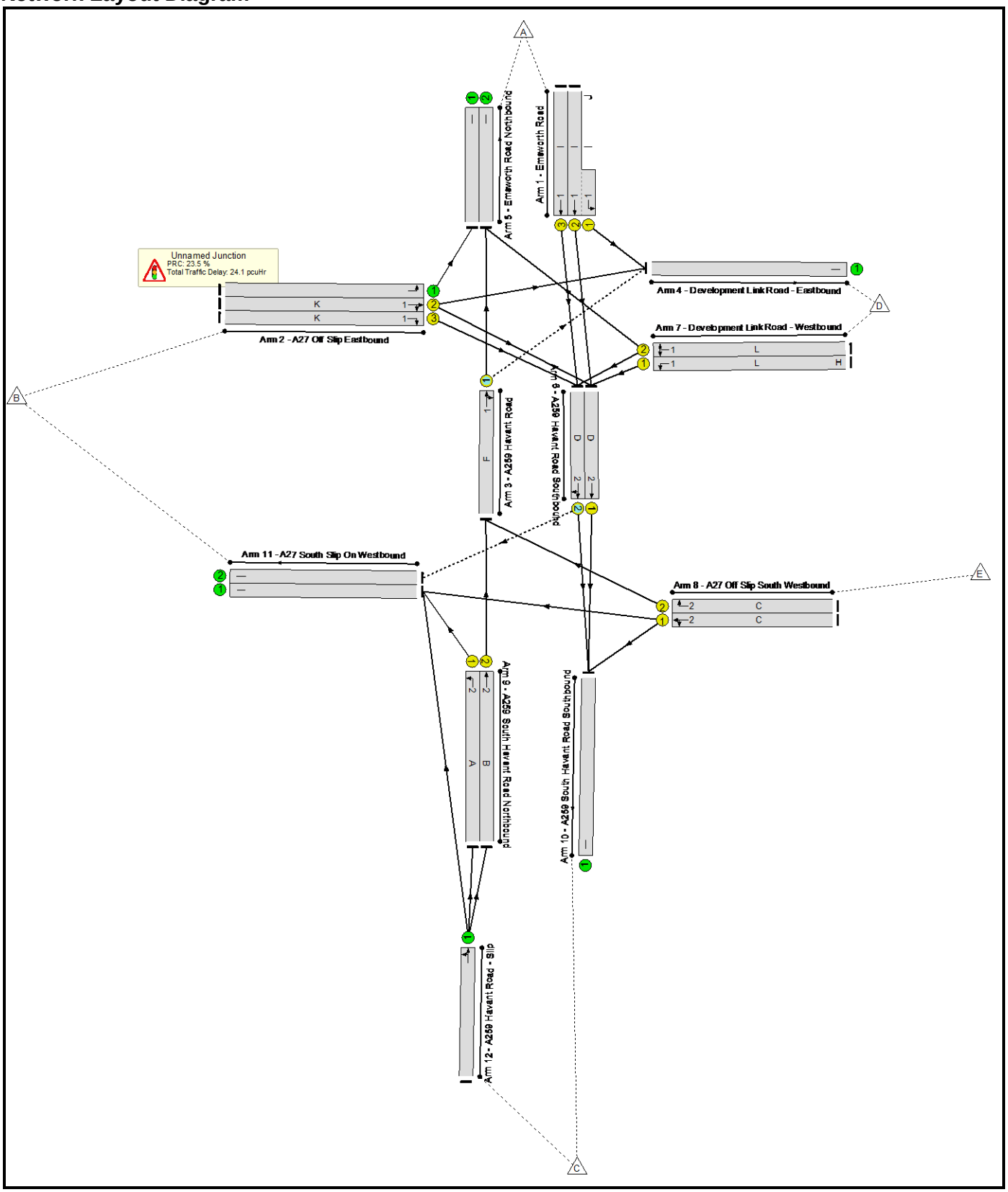
Full Input Data And Results

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	-	-	**N/A**	-	-		-	-	-	-	-	-	**72.9%**
Unnamed Junction	-	-	**N/A**	-	-		-	-	-	-	-	-	**72.9%**
1/2+1/1	Emsworth Road Left Ahead	U	1	N/A	I	J	1	25	0	339	1940:1940	265+426	49.1 : 49.1%
1/3	Emsworth Road Ahead	U	1	N/A	I		1	25	-	198	1940	560	35.3%
2/1	A27 Off Slip Eastbound Left	U	N/A	N/A	-		-	-	-	55	1786	1786	3.1%
2/2	A27 Off Slip Eastbound Ahead Right	U	1	N/A	K		1	29	-	235	1940	647	36.3%
2/3	A27 Off Slip Eastbound Right	U	1	N/A	K		1	29	-	421	1786	595	70.7%
3/1	A259 Havant Road Right Ahead	O	1	N/A	F		1	34	-	386	2115	611	63.2%
4/1	Development Link Road - Eastbound	U	N/A	N/A	-		-	-	-	299	Inf	Inf	0.0%
5/1	Emsworth Road Northbound	U	N/A	N/A	-		-	-	-	55	Inf	Inf	0.0%
5/2	Emsworth Road Northbound	U	N/A	N/A	-		-	-	-	380	Inf	Inf	0.0%
6/1	A259 Havant Road Southbound Ahead	U	2	N/A	D		1	67	-	338	1940	1466	23.1%
6/2	A259 Havant Road Southbound Ahead Right	O	2	N/A	D		1	67	-	771	1940	1189	64.9%
7/1	Development Link Road - Westbound Left	U	1	N/A	L	H	1	26	14	19	1940	582	3.3%
7/2	Development Link Road - Westbound Right Left	U	1	N/A	L		1	12	-	190	1902	275	69.2%
8/1	A27 Off Slip South Westbound Left Ahead	U	2	N/A	C		1	13	-	25	1764	274	9.1%

Full Input Data And Results

8/2	A27 Off Slip South Westbound Right	U	2	N/A	C		1	13	-	193	1764	274	70.3%
9/1	A259 South Havant Road Northbound Left	U	2	N/A	A		1	90	-	0	1940	-	-
9/2	A259 South Havant Road Northbound Ahead	U	2	N/A	B		1	39	-	193	1940	862	22.4%
10/1	A259 South Havant Road Southbound	U	N/A	N/A	-		-	-	-	784	Inf	Inf	0.0%
11/1	A27 South Slip On Westbound	U	N/A	N/A	-		-	-	-	1119	Inf	Inf	0.0%
11/2	A27 South Slip On Westbound	U	N/A	N/A	-		-	-	-	350	Inf	Inf	0.0%
12/1	A259 Havant Road - Slip Ahead Left	U	N/A	N/A	-		-	-	-	1312	1800	1800	72.9%

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	**-**	**-**	**360**	**34**	**0**	**16.1**	**8.0**	**0.0**	**24.1**	**-**	**-**	**-**	**-**
Unnamed Junction	**-**	**-**	**360**	**34**	**0**	**16.1**	**8.0**	**0.0**	**24.1**	**-**	**-**	**-**	**-**
1/2+1/1	339	339	-	-	-	2.4	0.5	-	2.8	30.2	4.1	0.5	4.6
1/3	198	198	-	-	-	1.4	0.3	-	1.7	30.3	3.9	0.3	4.2
2/1	55	55	-	-	-	0.0	0.0	-	0.0	1.0	0.0	0.0	0.0
2/2	235	235	-	-	-	1.5	0.3	-	1.8	27.1	4.4	0.3	4.7
2/3	421	421	-	-	-	3.1	1.2	-	4.3	36.4	9.1	1.2	10.3
3/1	386	386	25	19	0	1.1	0.9	-	2.0	18.6	4.9	0.9	5.7
4/1	299	299	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	55	55	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/2	380	380	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	338	338	-	-	-	0.4	0.1	-	0.5	5.4	3.3	0.1	3.5
6/2	771	771	335	15	0	1.3	0.9	-	2.2	10.2	6.6	0.9	7.5
7/1	19	19	-	-	-	0.1	0.0	-	0.1	25.6	0.3	0.0	0.3
7/2	190	190	-	-	-	1.9	1.1	-	3.0	57.3	4.5	1.1	5.6
8/1	25	25	-	-	-	0.2	0.1	-	0.3	39.8	0.5	0.1	0.6
8/2	193	193	-	-	-	1.9	1.2	-	3.1	57.5	4.6	1.2	5.7
9/1	-	-	-	-	-	-	-	-	-	-	-	-	-
9/2	193	193	-	-	-	0.8	0.1	-	1.0	18.1	2.9	0.1	3.1
10/1	784	784	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
11/1	1119	1119	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
11/2	350	350	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
12/1	1312	1312	-	-	-	0.0	1.3	-	1.3	3.7	0.0	1.3	1.3

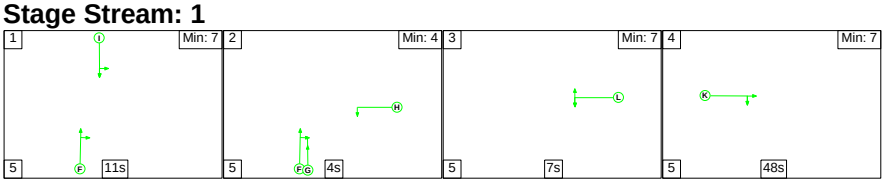
C1 Stream: 1 PRC for Signalled Lanes (%): 27.3 Total Delay for Signalled Lanes (pcuHr): 15.69 Cycle Time (s): 90
C1 Stream: 2 PRC for Signalled Lanes (%): 28.0 Total Delay for Signalled Lanes (pcuHr): 7.02 Cycle Time (s): 90
PRC Over All Lanes (%): 23.5 Total Delay Over All Lanes(pcuHr): 24.06

Full Input Data And Results

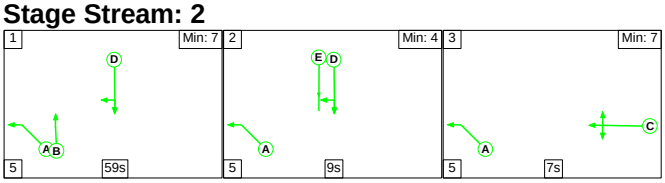
Scenario 4: '1100 Units AM Peak' (FG3: '1100 Units PM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

Stage Stream: 1



Stage Stream: 2



Stage Timings

Stage Stream: 1

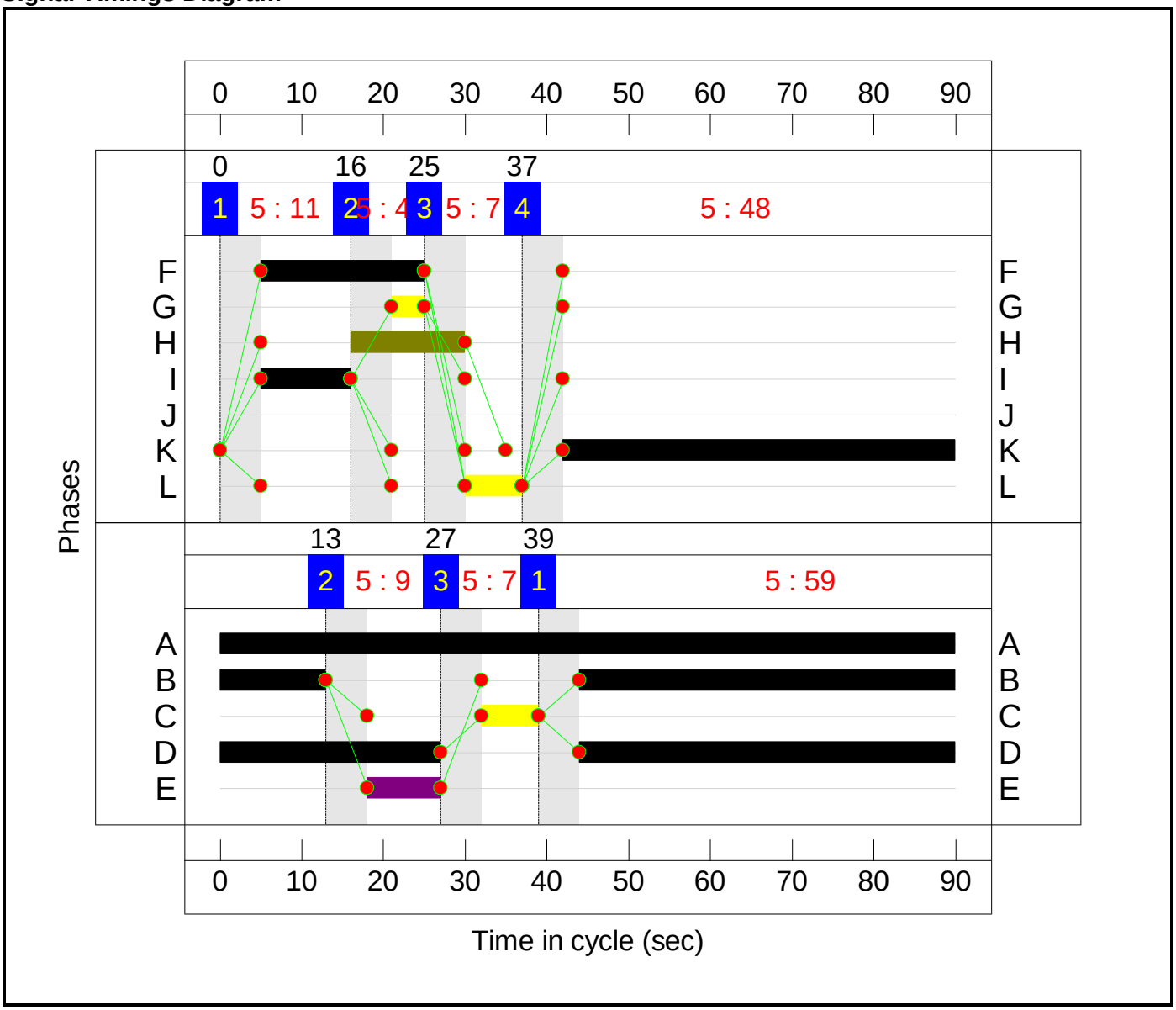
Stage	1	2	3	4
Duration	11	4	7	48
Change Point	0	16	25	37

Stage Stream: 2

Stage	1	2	3
Duration	59	9	7
Change Point	39	13	27

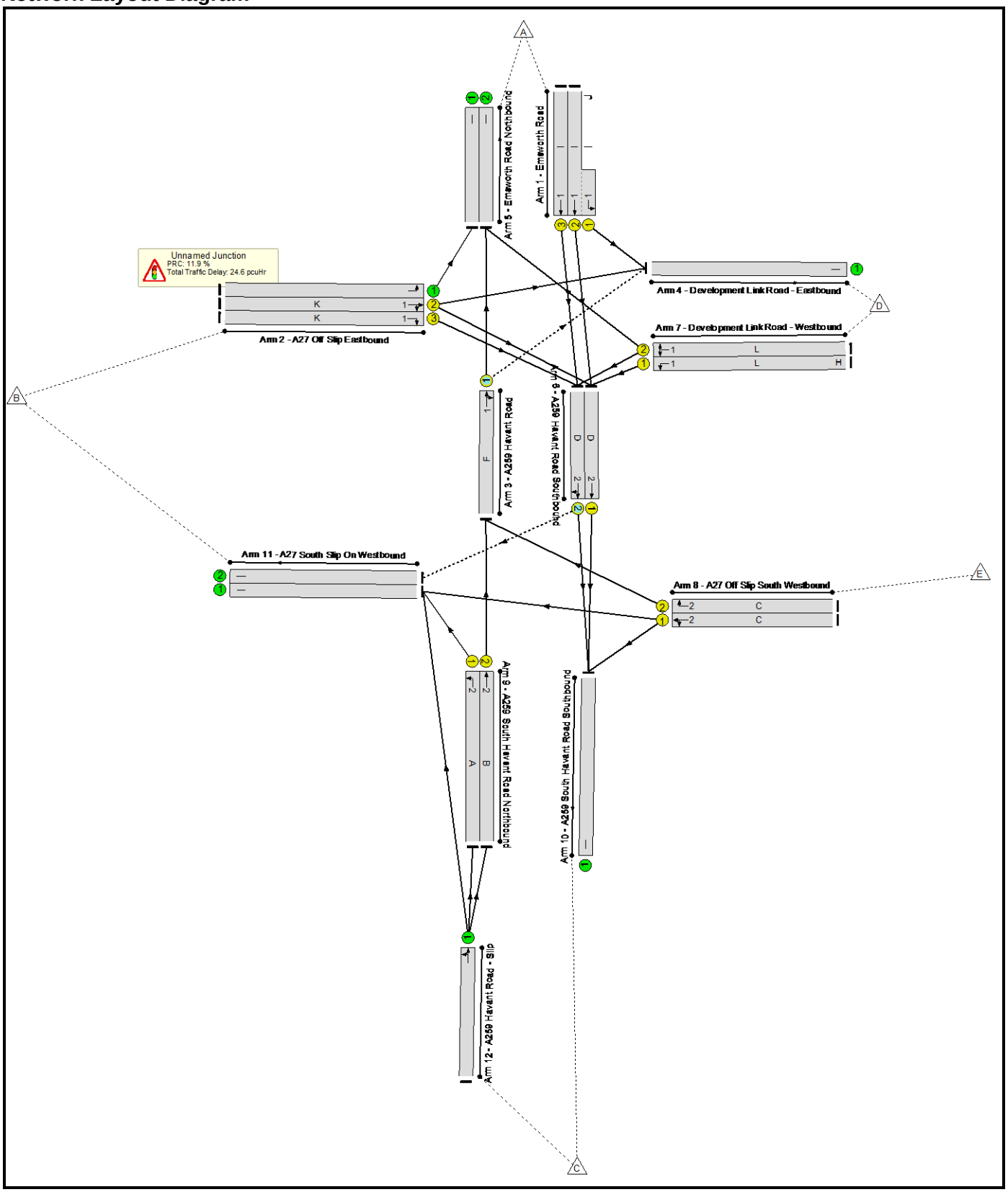
Full Input Data And Results

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	-	-	**N/A**	-	-		-	-	-	-	-	-	**80.4%**
Unnamed Junction	-	-	**N/A**	-	-		-	-	-	-	-	-	**80.4%**
1/2+1/1	Emsworth Road Left Ahead	U	1	N/A	I	J	1	11	0	258	1940:1940	134+242	68.7 : 68.7%
1/3	Emsworth Road Ahead	U	1	N/A	I		1	11	-	208	1940	259	80.4%
2/1	A27 Off Slip Eastbound Left	U	N/A	N/A	-		-	-	-	78	1786	1786	4.4%
2/2	A27 Off Slip Eastbound Ahead Right	U	1	N/A	K		1	48	-	655	1940	1056	62.0%
2/3	A27 Off Slip Eastbound Right	U	1	N/A	K		1	48	-	775	1786	972	79.7%
3/1	A259 Havant Road Right Ahead	O	1	N/A	F		1	20	-	151	2115	251	60.1%
4/1	Development Link Road - Eastbound	U	N/A	N/A	-		-	-	-	399	Inf	Inf	0.0%
5/1	Emsworth Road Northbound	U	N/A	N/A	-		-	-	-	78	Inf	Inf	0.0%
5/2	Emsworth Road Northbound	U	N/A	N/A	-		-	-	-	91	Inf	Inf	0.0%
6/1	A259 Havant Road Southbound Ahead	U	2	N/A	D		1	73	-	607	1940	1595	38.1%
6/2	A259 Havant Road Southbound Ahead Right	O	2	N/A	D		1	73	-	1043	1940	1436	72.6%
7/1	Development Link Road - Westbound Left	U	1	N/A	L	H	1	21	14	15	1940	474	3.2%
7/2	Development Link Road - Westbound Right Left	U	1	N/A	L		1	7	-	78	1896	169	46.3%
8/1	A27 Off Slip South Westbound Left Ahead	U	2	N/A	C		1	7	-	25	1764	157	15.9%

Full Input Data And Results

8/2	A27 Off Slip South Westbound Right	U	2	N/A	C		1	7	-	63	1764	157	40.2%
9/1	A259 South Havant Road Northbound Left	U	2	N/A	A		1	90	-	0	1940	-	-
9/2	A259 South Havant Road Northbound Ahead	U	2	N/A	B		1	59	-	88	1940	1293	6.8%
10/1	A259 South Havant Road Southbound	U	N/A	N/A	-		-	-	-	1407	Inf	Inf	0.0%
11/1	A27 South Slip On Westbound	U	N/A	N/A	-		-	-	-	928	Inf	Inf	0.0%
11/2	A27 South Slip On Westbound	U	N/A	N/A	-		-	-	-	268	Inf	Inf	0.0%
12/1	A259 Havant Road - Slip Ahead Left	U	N/A	N/A	-		-	-	-	1016	1800	1800	56.4%

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	**-**	**-**	**77**	**269**	**0**	**14.9**	**9.7**	**0.0**	**24.6**	**-**	**-**	**-**	**-**
Unnamed Junction	**-**	**-**	**77**	**269**	**0**	**14.9**	**9.7**	**0.0**	**24.6**	**-**	**-**	**-**	**-**
1/2+1/1	258	258	-	-	-	2.6	1.1	-	3.7	51.5	3.9	1.1	5.0
1/3	208	208	-	-	-	2.2	1.9	-	4.1	70.9	5.0	1.9	6.9
2/1	78	78	-	-	-	0.0	0.0	-	0.0	1.1	0.0	0.0	0.0
2/2	655	655	-	-	-	2.6	0.8	-	3.4	18.6	11.1	0.8	11.9
2/3	775	775	-	-	-	3.6	1.9	-	5.5	25.4	15.5	1.9	17.4
3/1	151	151	20	58	0	1.8	0.7	-	2.6	61.1	3.7	0.7	4.4
4/1	399	399	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	78	78	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/2	91	91	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	607	607	-	-	-	0.0	0.3	-	0.3	2.0	0.2	0.3	0.5
6/2	1043	1043	57	211	0	0.1	1.3	-	1.4	4.9	1.7	1.3	3.0
7/1	15	15	-	-	-	0.1	0.0	-	0.1	30.0	0.3	0.0	0.3
7/2	78	78	-	-	-	0.8	0.4	-	1.3	58.7	1.8	0.4	2.3
8/1	25	25	-	-	-	0.3	0.1	-	0.4	51.6	0.6	0.1	0.7
8/2	63	63	-	-	-	0.7	0.3	-	1.0	57.8	1.5	0.3	1.8
9/1	-	-	-	-	-	-	-	-	-	-	-	-	-
9/2	88	88	-	-	-	0.1	0.0	-	0.2	6.8	0.8	0.0	0.8
10/1	1407	1407	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
11/1	928	928	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
11/2	268	268	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
12/1	1016	1016	-	-	-	0.0	0.6	-	0.6	2.3	0.0	0.6	0.6

C1 Stream: 1 PRC for Signalled Lanes (%): 11.9 Total Delay for Signalled Lanes (pcuHr): 20.60 Cycle Time (s): 90
C1 Stream: 2 PRC for Signalled Lanes (%): 23.9 Total Delay for Signalled Lanes (pcuHr): 3.30 Cycle Time (s): 90
PRC Over All Lanes (%): 11.9 Total Delay Over All Lanes(pcuHr): 24.57

Appendix 6: Existing Junction Outputs

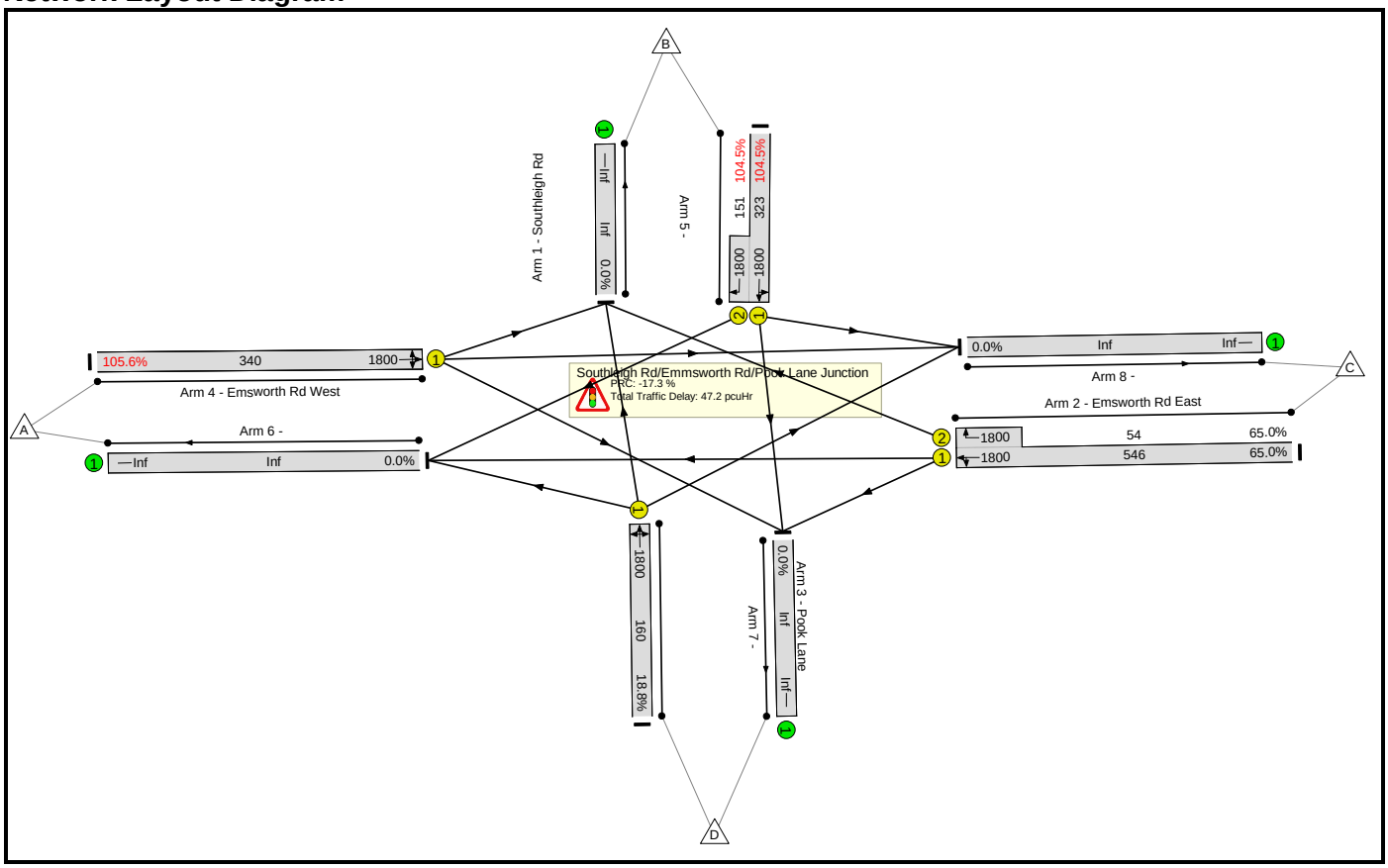
Basic Results Summary

User and Project Details

Project:	**Havant Borough Council**
Title:	**Southleigh Development Site**
Location:	
Client:	HBC
Additional detail:	
File name:	Option 1B Plus Southleigh Rd -Emsworth Rd-Pook Lane Signal Junction-ID 25.lsg3x
Author:	Glenn Josy
Company:	CampbellReith Hill
Address:	

Scenario 5: 'Scenario 3' (FG5: 'Flow Group 5-AM Peak Do Something ', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

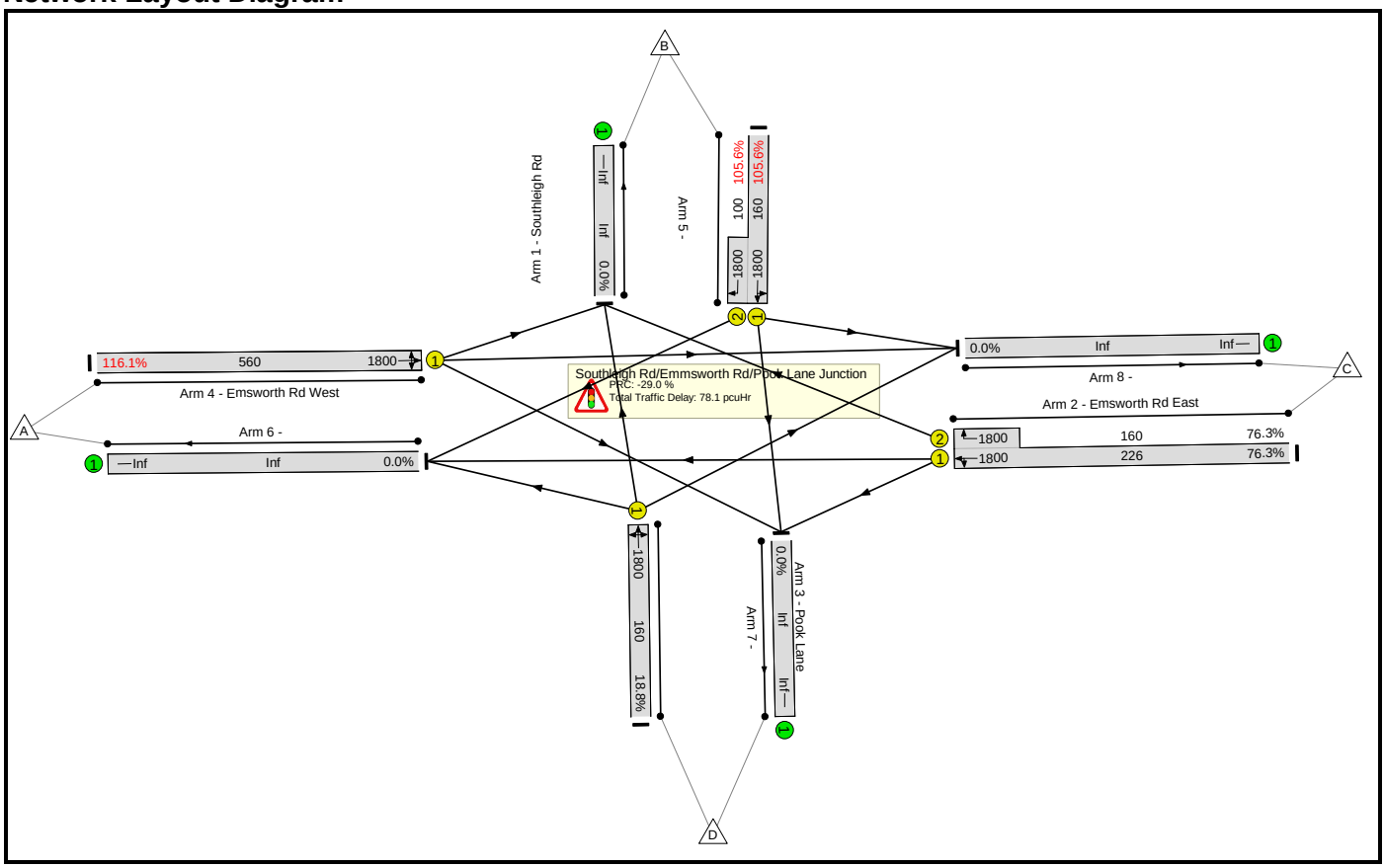
Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: Southleight Development Site	-	-	-		-	-	-	-	-	-	**105.6%**	**0**	**0**	**0**	**47.2**	-	-
Southleigh Rd/Emmsworth Rd/Pook Lane Junction	-	-	-		-	-	-	-	-	-	**105.6%**	**0**	**0**	**0**	**47.2**	-	-
1/1+1/2	Southleigh Rd Right Ahead Left	U	B		1	18	-	495	1800:1800	323+151	104.5 : 104.5%	-	-	-	23.1	167.9	28.5
2/1+2/2	Emsworth Rd East Right Ahead Left	U	D C		1	28:7	-	390	1800:1800	546+54	65.0 : 65.0%	-	-	-	3.8	35.4	8.7
3/1	Pook Lane Ahead Left Right	U	E		1	7	-	30	1800	160	18.8%	-	-	-	0.4	51.9	0.8
4/1	Emsworth Rd West Left Right Ahead	U	A		1	16	-	359	1800	340	105.6%	-	-	-	19.9	199.1	24.8

C1 PRC for Signalled Lanes (%): -17.3 Total Delay for Signalled Lanes (pcuHr): 47.21 Cycle Time (s): 90
PRC Over All Lanes (%): -17.3 Total Delay Over All Lanes(pcuHr): 47.21

Basic Results Summary

Scenario 6: 'Scenario 3' (FG6: 'Flow Group 6-PM Peak Do Something ', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: Southleight Development Site	-	-	-		-	-	-	-	-	-	**116.1%**	**0**	**0**	**0**	**78.1**	-	-
Southleigh Rd/Emmsworth Rd/Pook Lane Junction	-	-	-		-	-	-	-	-	-	**116.1%**	**0**	**0**	**0**	**78.1**	-	-
1/1+1/2	Southleigh Rd Right Ahead Left	U	B		1	7	-	275	1800:1800	160+100	105.6 : 105.6%	-	-	-	16.1	211.1	17.2
2/1+2/2	Emsworth Rd East Right Ahead Left	U	D C		1	39:7	-	294	1800:1800	226+160	76.3 : 76.3%	-	-	-	3.6	44.6	4.5
3/1	Pook Lane Ahead Left Right	U	E		1	7	-	30	1800	160	18.8%	-	-	-	0.4	51.9	0.8
4/1	Emsworth Rd West Left Right Ahead	U	A		1	27	-	650	1800	560	116.1%	-	-	-	57.9	320.8	66.9

C1 PRC for Signalled Lanes (%): -29.0 Total Delay for Signalled Lanes (pcuHr): 78.12 Cycle Time (s): 90
PRC Over All Lanes (%): -29.0 Total Delay Over All Lanes(pcuHr): 78.12

Junctions 9

PICADY 9 - Priority Intersection Module

Filename: PICADY-Horndean Rd-New Brighton Rd-ID 29 v2 Option 1B Plus.j9
Path: J:\13250-13499\13265 - Havant Borough Council\Docs\CR Docs\Reports\Southleigh Development\Part 2 Models
Report generation date: 12/12/2020 11:35:23

Summary of junction performance

	AM			
	Queue (PCU)	Delay (s)	RFC	LOS
	Horndean Rd/New Brighton - 2036 DoSomething			
Stream B-C	3.3	32.47	0.76	D
Stream B-A	0.7	21.02	0.40	C
Stream C-AB	1.5	11.17	0.49	B

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	Havant Borough Council
Location	Horndean Rd-New Brighton Rd Jn
Site number	ID 29
Date	20/08/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	13265
Enumerator	CAMPBELLREITH\HaidehH
Description	

Units

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

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Horndean Rd/New Brighton	100.000

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D5	2036 DoSomething	AM	ONE HOUR	08:00	09:30	15

Horndean Rd/New Brighton - 2036 DoSomething , AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Horndean Rd-Victoria Rd	T-Junction	Two-way		11.64	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Horndean Rd North		Major
B	New Brighton Rd		Minor
C	Horndean Rd South		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C - Horndean Rd South	6.00			50.0	✓	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 (Left) (m)	Lane Width (Right) (m)	Visibility to left (m)	Visibility to right (m)
B - New Brighton Rd	Two lanes	3.00	3.00	120	100

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	568	0.103	0.261	0.164	0.373
1	B-C	687	0.105	0.266	-	-
1	C-B	603	0.234	0.234	-	-

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

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Horndean Rd North		✓	525	100.000
B - New Brighton Rd		✓	459	100.000
C - Horndean Rd South		✓	456	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Horndean Rd North	B - New Brighton Rd	C - Horndean Rd South
From	A - Horndean Rd North	0	125	400
	B - New Brighton Rd	115	0	344
	C - Horndean Rd South	285	171	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Horndean Rd North	B - New Brighton Rd	C - Horndean Rd South
From	A - Horndean Rd North	10	10	10
	B - New Brighton Rd	10	10	10
	C - Horndean Rd South	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.76	32.47	3.3	D
B-A	0.40	21.02	0.7	C
C-AB	0.49	11.17	1.5	B
C-A				
A-B				
A-C				

Main Results for each time segment

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	259	564	0.459	255	0.9	12.679	B
B-A	87	396	0.219	85	0.3	12.703	B
C-AB	190	664	0.286	188	0.6	8.293	A
C-A	153			153			
A-B	94			94			
A-C	301			301			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	309	537	0.575	307	1.4	17.035	C
B-A	103	362	0.286	103	0.4	15.259	C
C-AB	248	679	0.365	247	0.9	9.172	A
C-A	162			162			
A-B	112			112			
A-C	360			360			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	379	499	0.759	372	3.1	29.824	D
B-A	127	315	0.401	125	0.7	20.719	C
C-AB	343	701	0.489	341	1.5	11.017	B
C-A	159			159			
A-B	138			138			
A-C	440			440			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	379	498	0.760	378	3.3	32.473	D
B-A	127	315	0.402	127	0.7	21.019	C
C-AB	344	702	0.490	344	1.5	11.167	B
C-A	158			158			
A-B	138			138			
A-C	440			440			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	309	537	0.576	316	1.6	18.451	C
B-A	103	361	0.286	104	0.5	15.509	C
C-AB	249	681	0.366	252	0.9	9.324	A
C-A	161			161			
A-B	112			112			
A-C	360			360			

09:15 - 09:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	259	563	0.460	261	1.0	13.211	B
B-A	87	395	0.219	87	0.3	12.893	B
C-AB	191	665	0.288	192	0.6	8.420	A
C-A	152			152			
A-B	94			94			
A-C	301			301			

Junctions 9

PICADY 9 - Priority Intersection Module

Filename: PICADY-Horndean Rd-New Brighton Rd-ID 29 v2 Option 1B Plus.j9
Path: J:\13250-13499\13265 - Havant Borough Council\Docs\CR Docs\Reports\Southleigh Development\Part 2 Models
Report generation date: 12/12/2020 11:36:29

Summary of junction performance

	PM			
	Queue (PCU)	Delay (s)	RFC	LOS
	Horndean Rd/New Brighton - 2036 DoSomething			
Stream B-C	0.7	12.85	0.40	B
Stream B-A	1.0	27.56	0.49	D
Stream C-AB	6.2	28.30	0.81	D

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	Havant Borough Council
Location	Horndean Rd-New Brighton Rd Jn
Site number	ID 29
Date	20/08/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	13265
Enumerator	CAMPBELLREITH\HaidehH
Description	

Units

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

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Horndean Rd/New Brighton	100.000

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D6	2036 DoSomething	PM	ONE HOUR	17:00	18:30	15

Horndean Rd/New Brighton - 2036 DoSomething , PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Horndean Rd-Victoria Rd	T-Junction	Two-way		14.95	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Horndean Rd North		Major
B	New Brighton Rd		Minor
C	Horndean Rd South		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C - Horndean Rd South	6.00			50.0	✓	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 (Left) (m)	Lane Width (Right) (m)	Visibility to left (m)	Visibility to right (m)
B - New Brighton Rd	Two lanes	3.00	3.00	120	100

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	568	0.103	0.261	0.164	0.373
1	B-C	687	0.105	0.266	-	-
1	C-B	603	0.234	0.234	-	-

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

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Horndean Rd North		✓	425	100.000
B - New Brighton Rd		✓	310	100.000
C - Horndean Rd South		✓	628	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Horndean Rd North	B - New Brighton Rd	C - Horndean Rd South
From	A - Horndean Rd North	0	125	300
	B - New Brighton Rd	126	0	184
	C - Horndean Rd South	343	285	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Horndean Rd North	B - New Brighton Rd	C - Horndean Rd South
From	A - Horndean Rd North	10	10	10
	B - New Brighton Rd	10	10	10
	C - Horndean Rd South	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.40	12.85	0.7	B
B-A	0.49	27.56	1.0	D
C-AB	0.81	28.30	6.2	D
C-A				
A-B				
A-C				

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	139	578	0.240	137	0.3	8.955	A
B-A	95	376	0.252	93	0.4	13.926	B
C-AB	337	711	0.474	332	1.3	10.387	B
C-A	136			136			
A-B	94			94			
A-C	226			226			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	165	552	0.300	165	0.5	10.215	B
B-A	113	338	0.335	113	0.5	17.532	C
C-AB	444	735	0.604	441	2.2	13.474	B
C-A	120			120			
A-B	112			112			
A-C	270			270			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	203	512	0.395	202	0.7	12.703	B
B-A	139	285	0.486	137	1.0	26.358	D
C-AB	623	770	0.809	610	5.6	24.382	C
C-A	68			68			
A-B	138			138			
A-C	330			330			

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	203	511	0.397	203	0.7	12.854	B
B-A	139	282	0.492	139	1.0	27.560	D
C-AB	631	776	0.813	629	6.2	28.297	D
C-A	60			60			
A-B	138			138			
A-C	330			330			

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	165	550	0.301	166	0.5	10.345	B
B-A	113	333	0.341	115	0.6	18.345	C
C-AB	452	743	0.609	467	2.5	15.354	C
C-A	112			112			
A-B	112			112			
A-C	270			270			

18:15 - 18:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	139	577	0.240	139	0.4	9.057	A
B-A	95	374	0.254	96	0.4	14.293	B
C-AB	341	714	0.477	345	1.4	10.946	B
C-A	132			132			
A-B	94			94			
A-C	226			226			

Junctions 9

PICADY 9 - Priority Intersection Module

Filename: PICCADY-Horndean Rd-Southleigh Rd-ID60-61 v2 Option1B Plus.j9
Path: J:\13250-13499\13265 - Havant Borough Council\Docs\CR Docs\Reports\Southleigh Development\Part 2 Models
Report generation date: 12/12/2020 11:17:57

Summary of junction performance

	AM Peak			
	Queue (PCU)	Delay (s)	RFC	LOS
	Horndean Rd /Southleigh - 2036DoSomething			
Stream B-ACD	1.3	20.29	0.56	C
Stream A-BCD	0.1	6.29	0.06	A
Stream D-ABC	1.6	19.74	0.62	C
Stream C-ABD	0.3	7.59	0.21	A

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	Havant Borough Council
Location	Horndean Rd/Southleigh Rd
Site number	
Date	14/08/2019
Version	
Status	(new file)
Identifier	
Client	HBC
Jobnumber	13265
Enumerator	CAMPBELLREITH\HaidehH
Description	

Units

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

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Horndean Rd /Southleigh	100.000

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D5	2036DoSomething	AM Peak	ONE HOUR	08:00	09:30	15

Horndean Rd /Southleigh - 2036DoSomething , AM Peak

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Horndean Rd/Southleigh Rd	Right-Left Stagger	Two-way		7.96	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Horndean Rd South		Major
B	Southleigh Rd West		Minor
C	Horndean Rd North		Major
D	Southleigh Rd East		Minor

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width for right turn (m)	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
A - Horndean Rd South	15.60	✓	3.50	✓	2.20	250.0	✓	6.00
C - Horndean Rd North	6.70			✓	3.00	250.0	✓	6.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B - Southleigh Rd West	One lane	3.00	45	58
D - Southleigh Rd East	One lane	3.00	86	52

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/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
1	A-D	719	-	-	-	0.162	0.162	0.162	-	0.162	-	-
1	B-AD	521	0.092	0.232	-	-	-	0.146	0.332	0.146	0.092	0.232
1	B-C	660	0.098	0.248	-	-	-	-	-	-	0.098	0.248
1	C-B	781	0.294	0.294	-	-	-	-	-	-	0.294	0.294
1	D-A	657	-	-	-	0.148	0.059	0.148	-	0.059	-	-
1	D-BC	573	0.090	0.090	0.204	0.142	0.056	0.142	-	0.056	-	-

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

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Horndean Rd South		✓	298	100.000
B - Southleigh Rd West		✓	215	100.000
C - Horndean Rd North		✓	591	100.000
D - Southleigh Rd East		✓	280	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A - Horndean Rd South	B - Southleigh Rd West	C - Horndean Rd North	D - Southleigh Rd East
From	A - Horndean Rd South	0	18	245	35
	B - Southleigh Rd West	40	0	145	30
	C - Horndean Rd North	320	120	0	151
	D - Southleigh Rd East	65	50	165	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A - Horndean Rd South	B - Southleigh Rd West	C - Horndean Rd North	D - Southleigh Rd East
From	A - Horndean Rd South	0	2	4	2
	B - Southleigh Rd West	4	0	4	2
	C - Horndean Rd North	4	4	0	2
	D - Southleigh Rd East	2	2	2	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-ACD	0.56	20.29	1.3	C
A-BCD	0.06	6.29	0.1	A
A-B				
A-C				
D-ABC	0.62	19.74	1.6	C
C-ABD	0.21	7.59	0.3	A
C-D				
C-A				

Main Results for each time segment

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	162	485	0.334	160	0.5	11.426	B
A-BCD	26	653	0.040	26	0.0	5.859	A
A-B	14			14			
A-C	184			184			
D-ABC	211	525	0.402	208	0.7	11.510	B
C-ABD	90	676	0.134	90	0.2	6.382	A
C-D	114			114			
C-A	241			241			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	193	458	0.422	192	0.7	13.992	B
A-BCD	31	640	0.049	31	0.1	6.035	A
A-B	16			16			
A-C	220			220			
D-ABC	252	512	0.492	251	1.0	14.000	B
C-ABD	108	655	0.165	108	0.2	6.844	A
C-D	136			136			
C-A	288			288			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	237	421	0.563	235	1.3	19.822	C
A-BCD	39	622	0.062	38	0.1	6.292	A
A-B	20			20			
A-C	270			270			
D-ABC	308	494	0.624	306	1.6	19.248	C
C-ABD	132	626	0.211	132	0.3	7.570	A
C-D	166			166			
C-A	352			352			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	237	420	0.563	237	1.3	20.293	C
A-BCD	39	622	0.062	39	0.1	6.294	A
A-B	20			20			
A-C	270			270			
D-ABC	308	494	0.624	308	1.6	19.738	C
C-ABD	132	625	0.211	132	0.3	7.588	A
C-D	166			166			
C-A	352			352			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	193	458	0.422	195	0.8	14.356	B
A-BCD	31	640	0.049	32	0.1	6.040	A
A-B	16			16			
A-C	220			220			
D-ABC	252	511	0.492	254	1.0	14.410	B
C-ABD	108	654	0.165	108	0.2	6.868	A
C-D	136			136			
C-A	288			288			

09:15 - 09:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	162	484	0.335	163	0.5	11.670	B
A-BCD	26	653	0.040	26	0.0	5.866	A
A-B	14			14			
A-C	184			184			
D-ABC	211	524	0.402	212	0.7	11.805	B
C-ABD	90	675	0.134	91	0.2	6.411	A
C-D	114			114			
C-A	241			241			

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.0.6896

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

Filename: PICCADY-Horndean Rd-Southleigh Rd-ID60-61 v2 Option1B Plus.j9
Path: J:\13250-13499\13265 - Havant Borough Council\Docs\CR Docs\Reports\Southleigh Development\Part 2 Models
Report generation date: 12/12/2020 11:19:30

Summary of junction performance

	PM Peak			
	Queue (PCU)	Delay (s)	RFC	LOS
	Horndean Rd /Southleigh - 2036 DoSomething			
Stream B-ACD	4.1	72.93	0.83	F
Stream A-BCD	0.0	0.00	0.00	A
Stream D-ABC	2.0	24.27	0.68	C
Stream C-ABD	0.7	10.95	0.41	B

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	Havant Borough Council
Location	Horndean Rd/Southleigh Rd
Site number	
Date	14/08/2019
Version	
Status	(new file)
Identifier	
Client	HBC
Jobnumber	13265
Enumerator	CAMPBELLREITH\HaidehH
Description	

Units

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

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Horndean Rd /Southleigh	100.000

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D6	2036 DoSomething	PM Peak	ONE HOUR	17:00	18:30	15

Horndean Rd /Southleigh - 2036 DoSomething , PM Peak

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Horndean Rd/Southleigh Rd	Right-Left Stagger	Two-way		14.55	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Horndean Rd South		Major
B	Southleigh Rd West		Minor
C	Horndean Rd North		Major
D	Southleigh Rd East		Minor

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width for right turn (m)	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
A - Horndean Rd South	15.60	✓	3.50	✓	2.20	250.0	✓	6.00
C - Horndean Rd North	6.70			✓	3.00	250.0	✓	6.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B - Southleigh Rd West	One lane	3.00	45	58
D - Southleigh Rd East	One lane	3.00	86	52

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/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
1	A-D	719	-	-	-	0.162	0.162	0.162	-	0.162	-	-
1	B-AD	521	0.092	0.232	-	-	-	0.146	0.332	0.146	0.092	0.232
1	B-C	660	0.098	0.248	-	-	-	-	-	-	0.098	0.248
1	C-B	781	0.294	0.294	-	-	-	-	-	-	0.294	0.294
1	D-A	657	-	-	-	0.148	0.059	0.148	-	0.059	-	-
1	D-BC	573	0.090	0.090	0.204	0.142	0.056	0.142	-	0.056	-	-

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

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Horndean Rd South		✓	383	100.000
B - Southleigh Rd West		✓	201	100.000
C - Horndean Rd North		✓	776	100.000
D - Southleigh Rd East		✓	285	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A - Horndean Rd South	B - Southleigh Rd West	C - Horndean Rd North	D - Southleigh Rd East
From	A - Horndean Rd South	0	75	308	0
	B - Southleigh Rd West	78	0	68	55
	C - Horndean Rd North	350	215	0	211
	D - Southleigh Rd East	40	85	160	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A - Horndean Rd South	B - Southleigh Rd West	C - Horndean Rd North	D - Southleigh Rd East
From	A - Horndean Rd South	0	2	4	2
	B - Southleigh Rd West	4	0	4	2
	C - Horndean Rd North	4	4	0	2
	D - Southleigh Rd East	2	2	2	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-ACD	0.83	72.93	4.1	F
A-BCD	0.00	0.00	0.0	A
A-B				
A-C				
D-ABC	0.68	24.27	2.0	C
C-ABD	0.41	10.95	0.7	B
C-D				
C-A				

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	151	367	0.412	149	0.7	16.808	C
A-BCD	0	1274	0.000	0	0.0	0.000	A
A-B	56			56			
A-C	232			232			
D-ABC	215	503	0.427	212	0.7	12.496	B
C-ABD	162	643	0.252	161	0.3	7.744	A
C-D	159			159			
C-A	263			263			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	181	326	0.554	179	1.2	24.913	C
A-BCD	0	1241	0.000	0	0.0	0.000	A
A-B	67			67			
A-C	277			277			
D-ABC	256	487	0.526	255	1.1	15.734	C
C-ABD	193	616	0.314	193	0.5	8.850	A
C-D	190			190			
C-A	315			315			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	221	267	0.828	212	3.6	59.051	F
A-BCD	0	1194	0.000	0	0.0	0.000	A
A-B	83			83			
A-C	339			339			
D-ABC	314	465	0.675	310	2.0	23.240	C
C-ABD	238	581	0.410	237	0.7	10.864	B
C-D	232			232			
C-A	384			384			

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	221	266	0.831	219	4.1	72.931	F
A-BCD	0	1192	0.000	0	0.0	0.000	A
A-B	83			83			
A-C	339			339			
D-ABC	314	464	0.676	313	2.0	24.265	C
C-ABD	238	580	0.411	238	0.7	10.950	B
C-D	232			232			
C-A	384			384			

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	181	325	0.557	192	1.4	29.982	D
A-BCD	0	1238	0.000	0	0.0	0.000	A
A-B	67			67			
A-C	277			277			
D-ABC	256	486	0.528	260	1.2	16.486	C
C-ABD	193	614	0.315	194	0.5	8.940	A
C-D	190			190			
C-A	315			315			

18:15 - 18:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	151	366	0.413	154	0.8	17.747	C
A-BCD	0	1273	0.000	0	0.0	0.000	A
A-B	56			56			
A-C	232			232			
D-ABC	215	502	0.427	216	0.8	12.910	B
C-ABD	162	642	0.252	162	0.4	7.823	A
C-D	159			159			
C-A	263			263			

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