Lambert Smith Hampton

Application by National Highways for Order Granting Development Consent for the Lower Thames Crossing

WRITTEN REPRESENTATION

on behalf of DPWLG

Interested Party Ref: 20035309

July 2023

Lambert Smith Hampton

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1.0 INTRODUCTION

1.1 INTRODUCTION TO WRITTEN REPRESENTATIONS

1.1.1 Lambert Smith Hampton ('LSH') are instructed by London Gateway Port Limited, LG Park Freehold Limited and LG Park Leasehold Limited (collectively hereinafter referred to as 'DPWLG'), who are the owners and operators of DP World London Gateway Port (the Port) and DP World London Gateway Logistics Park (the Logistics Park) on the north bank of the Thames Estuary in Stanford-le Hope, Essex. The Port and Logistics Park are separately and collectively of national significance and importance.

1.1.2 The Port is a Nationally Significant Infrastructure Project ('NSIP') within the Thames Freeport Area and makes a significant contribution to the national economy. In 2022 a combined £30bn of total trade (imports and exports) passed through the Port, 4% of the UK total.

1.1.3 Once fully developed, the Port will comprise deep sea shipping and container handling facilities with an annual throughput that will equate to approximately 27% of the predicted national growth in such trade by 2030. The adjacent Logistics Park will provide up to 829,700 sqm of vital commercial floorspace.

1.1.4 The National Policy Statement for Ports ('NPS for Ports') (2012) sets out the Government's support for the growth and development of the UK's port infrastructure and references their '*essential role'* in the national economy. It places particular emphasis on maintaining the resilience and competitiveness of national ports through enhanced access. The NPS for Ports is in the process of being revised, and the likelihood is that this emphasis will gain even greater weight due to the emergence of free ports and their role to the UK's economic future.

1.1.5 Whilst DPWLG have no in-principle objection to the proposed Lower Thames Crossing ('LTC Project') and acknowledges the wider transport network benefits it would deliver, they have significant concerns in relation to the induced congestion and substantial increase in delays that would arise at the A13/A128 Orsett Cock junction and the A13/A1014 Manorway junction ('the Orsett Cock and Manorway junctions') as a direct result of the Project. This would cause unreliable travel times to and from the Port and Logistics Park, which in turn would result in considerable disruption and uncertainty for its users.

1.1.6 The Manorway Junction is located along the sole access route to the Port and Logistics Park and is critical to its operations. Despite the importance that national guidance places on the resilience and competitiveness of ports, National Highways ('the Applicant') has not submitted any detailed modelling evidence to demonstrate that the status quo in terms of access to the port will be maintained, nor has it proposed any satisfactory mitigation measures to alleviate the significant adverse impacts on both junctions which would be caused by the LTC Project. Such evidence, as DPWLG's highways consultants have thus far been able to assess, indicates that these problems are likely to arise, due principally to vehicles utilising the Manorway Junction to access the A1089 from the LTC rather than use the Orsett Cock junction to do so. The existing layout and geometry of the Manorway Junction is such that the free flow of traffic to the Port and Park will be hindered by inadequate queueing capacity.

1.1.7 The unreliability of travel times as a result of the induced congestion and increased delays at the Orsett Cock and Manorway junctions would have the following consequential impacts for the operations of the Port and Logistics Park:

(i) **Adverse impacts on the reliability and resilience of the Port** – container stacks within the Port are arranged in accordance with timed booking slots for their corresponding HGV to allow for smooth and efficient Truck Turnaround Times ('TTT'). Unexpected delays on the highway network would prevent multiple HGVs from arriving at the Port within their allocated booking slot (and thus be required to re-book a later slot) meaning containers are no longer arranged in the correct order. As a result, additional time is spent by cranes rearranging the container stack, which causes average TTT (across a 24-hour period) to increase. Such disruption has ripple effect throughout the day, even when demand drops off.

(ii) **Adverse impacts on hauliers and end users** – Hauliers failing to arrive within their allocated time slot creates inefficiencies for the hauliers themselves as they are required to re-book and wait for a new time slot. This results in increased operating costs for the hauliers and has an adverse impact on reputation. There are also adverse impacts for the destination facilities receiving the freight as deliveries are delayed.

(iii) **Adverse impact on the reputation and future development of the Port and Logistics Park** – the increased frequency in unexpected delays and increased TTT would have the real potential to deter hauliers from using the Port as a provider altogether. This would diminish the reputation of the Port and may impact its future development. It may also deter logistics operators from locating their operations at the Logistics Park.

1.1.8 Given the Government's emphasis on maintaining competitive and resilient national ports (as set out in NPS for Ports), it is essential that the Examination Authority(' ExA') in making a recommendation to the Secretary of State ('SoS) are satisfied as to whether any impacts would occur at the Orsett Cock and Manorway junctions in relation to: (i) the safe and efficient operation of those junctions, and (ii) in respect of the consequential impacts on access to the Port and Logistics Park and the operation. It is our view that the

Applicant has not provided sufficient information to allow the ExA and SoS to make any such assessment with the necessary degree of confidence.

1.1.9 Given the inadequate information provided by the Applicant, DPWLG has commissioned the following technical reports:

- Written Representations in relation to Traffic Impact Assessment undertaken by DTA Transportation Ltd. ('Transport Report') (Annex A);
- Written Representations in relation to Economic Impact undertaken by Volterra ('Economic Impact Report') (Annex B).

1.1.10 These reports are provided at Annex A and Annex B and should be read alongside these Written Representations. They have been commissioned to ensure that the ExA and SoS can be aware of the likely impacts not adequately assessed by the Applicant and to be in a position properly to assess the impacts at the Orsett Cock and Manorway junctions in relation to their safe and efficient operation and the consequential impacts on the efficient functioning of the Port and Logistics Park should the Project be approved without adequate and timely mitigation. It is important to note that the findings of the technical reports are based on the assessment of data available to date. Whilst the impacts should be considered as indicative at this stage, they are highly likely to be worse following further assessment. In this regard, we reserve the right to undertake and submit further assessment of the transport and economic impacts at an appropriate point later in the examination process.

1.1.11 The DTA Transport Report (Annex A) puts forward schematic potential mitigation measures that would (subject to further investigation and design work) alleviate significant adverse impacts on the Port and Logistics Park. In relation to this, the analysis presented in the Economic Impact Report (Annex B) indicates that appropriate highway mitigation proposals would strengthen the case for the LTC Project and would be likely to deliver good Value for Money ('VfM') for the taxpayer.

1.1.12 Irrespective of the VfM considerations, resilience of the Port should be maintained and access not impeded by the LTC Project in line with national policy objectives. As currently proposed (i.e. without any mitigation measures for the Orsett Cock and Manorway junctions), the LTC Project would fail to meet the requirements of the relevant National Policy Statements and its own stated objectives (set out at Table 4.1 of the Planning Statement – Ref: APP-495).

1.2 SUMMARY OF PREVIOUS CONSULTATION BETWEEN DPWLG AND NATIONAL HIGHWAYS

1.2.1 DPWLG (together with their Transport Consultants – DTA) have been engaged with the Applicant throughout the lifetime of the LTC Project to understand the key project interfaces in relation to the Port and Logistics Park and means of resolving them.

1.2.2 Prior to the submission of the Development Consent Order ('DCO') application, DPWLG submitted the following consultation responses to the Applicant:

- Options Consultation Response (March 2016);
- Statutory Consultation Response (December 2018);
- Supplementary Consultation Response (March 2020);
- Design Refinement Consultation Response (August 2020);
- Design Refinement Consultation Response (September 2021); and
- Community Impacts Consultation Response (June 2022).

1.2.3 Throughout the consultation process, DPWLG have maintained their in-principle support of the LTC Project but have continuously raised significant concerns regarding the impact of the Project on the Orsett Cock and Manorway junctions in relation to the operations of the Port and Logistics Park.

1.2.4 In October 2022, DPWLG and the Applicant signed a Statement of Common Ground ('SoCG') which sets out several matters that are identified as 'Under Discussion'. The matters listed in the SoCG include: 'Overall traffic modelling'; 'Congestion at Manorway junction'; 'Congestion and rat-running at Orsett Cock Junction'; and 'Traffic modelling results on the A13'. The SoCG is due to be amended by the Applicant to include an agreed itinerary for an Accompanied Site Inspection ('ASI') to the Port and Logistics Park.

1.2.5 Following the submission of the DCO application by the Applicant, the DPWLG Team have continued to meet with the Applicant on an ad hoc basis and has made the following submissions to the ExA:

- Relevant Representations (February 2023);
- Principal Areas of Disagreement ('PADs') (March 2023);
- Written Submissions to the Preliminary Hearing (May 2023); and
- Oral Submissions at the Preliminary Hearing and at Issue Specific Hearings 1 & 2 (June 2023).

1.2.6 These Written Representations expand upon the information provided in the above submissions. However, we reserve the right to submit further representations in response any additional evidence submitted by the Applicant throughout the examination process.

2.0 OVERVIEW OF DP WORLD LONDON GATEWAY

2.1 OVERVIEW OF LONDON GATEWAY PORT AND LOGISTICS PARK

2.1.1 The DPWLG development comprises two elements: (i) DP World London Gateway Port (the Port); and (ii) DP World London Gateway Logistics Park (the Logistics Park). The Port and Logistics Park are located on the north banks of the River Thames at Stanford-le-Hope, Essex. The plan below shows the location (shaded grey) in relation to the LTC Project, including the critical Orsett Cock and Manorway Junctions on the A13.

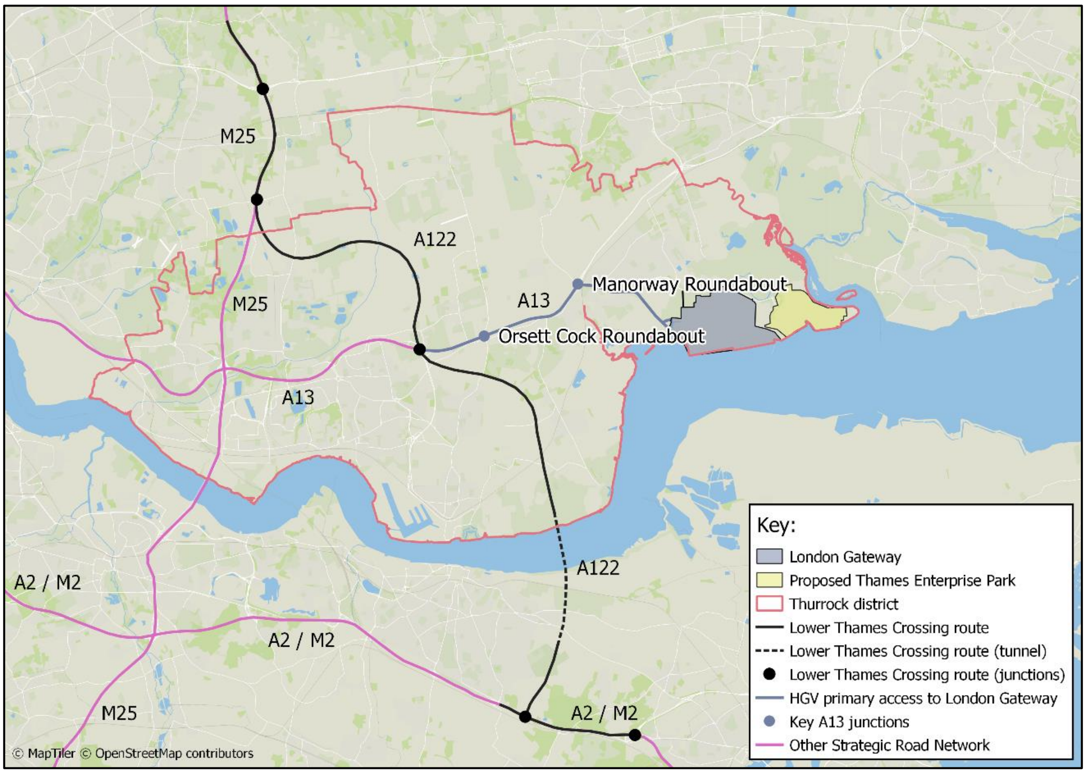

Figure 1 – Plan showing location of DPWLG in relation to LTC (Volterra Economic Impact Report)

2.1.2 The Port and Logistics Park (as well as the nearby road infrastructure) are located outside of the Order Limits of the Development Consent Order. The plan below shows the proximity of the Order Limits boundary to the Port and Logistics Park.

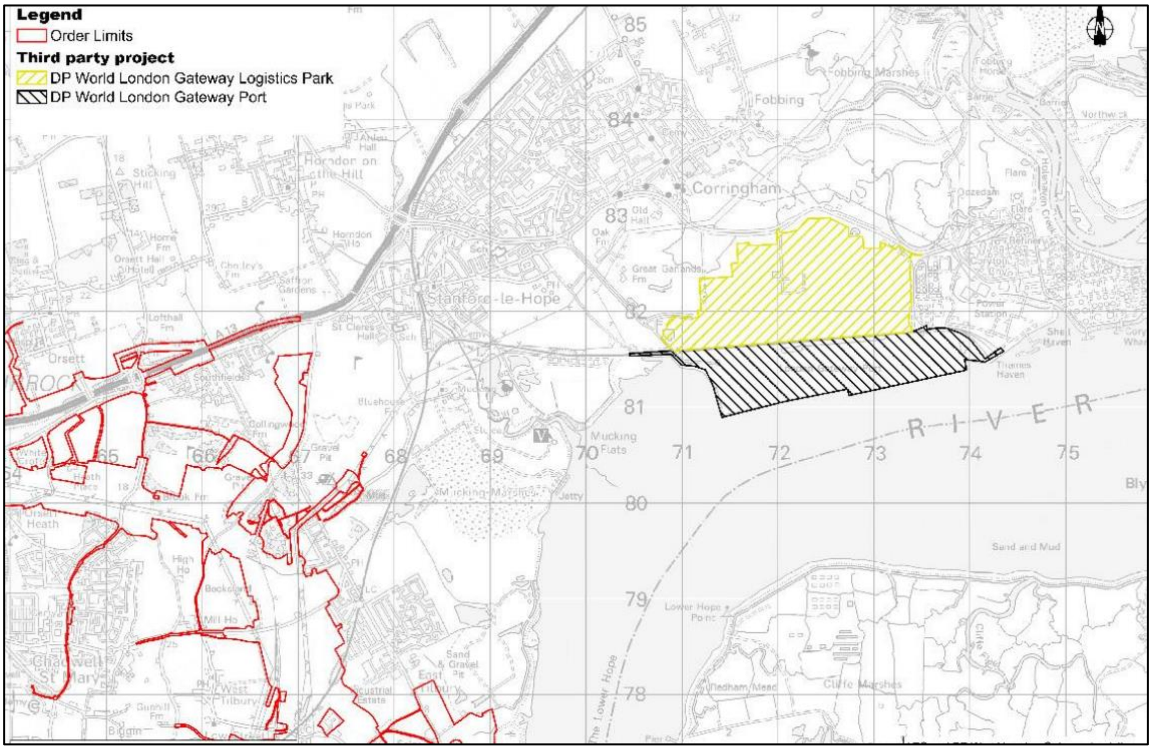

Figure 2 - Location of the Order Limits (outlined red) in relation to the Port and Logistics Park

2.1.3 The Port itself is a Nationally Significant Infrastructure Project ('NSIP'). It was consented by The London Gateway Port Harbour Empowerment Order 2008 (Reference SI 2008, No.1261) ('the HEO'), which was made on 2nd May 2008 and came into force on 16th May 2008. It consents up to seven deep sea container berths serving primarily container (cellular) shipping vessels (or alternatively 6 berths plus a Roll on/Roll off ('RoRo') facility) plus ancillary facilities including container handling equipment, container storage areas ('stacks'), two rail interchanges, operational buildings, a gate complex and service facilities including access ways and electricity sub-stations.

2.1.4 The Logistics Park was originally consented pursuant to an Outline Planning Consent (Reference 02/00084/OUT). This was, however, superseded by the London Gateway Logistics Park Local Development Order ('LDO1'), which was made by Thurrock Council on 7th November 2013.

2.1.5 LDO1 permits up to 829,700 sqm of industrial (use class B1(b), B1(c), B2 and B8) floor space within buildings with an individual floor area ranging from between 1,000 and 150,000 sqm each. A 'common user' rail terminal is also permitted.

2.1.6 The latest Annual Monitoring Report for the LDO1 (dated 7th November 2022) illustrates that the total amount of permitted floorspace pursuant to the LDO on the 7th November 2021 was:

- B8 – 298,217sq.m
- B2 – 3,295sq.m
- B1(c) – 3,569sq.m

2.1.7 The above represents approximately 35.9% of the total permitted floorspace under the LDO (46.2% of B8 and 3.4% of B1(c)/B2).

2.1.8 The location of the Logistics Park directly adjacent to the Port and its associated rail terminals allows significant supply chain efficiency benefits and facilitates a move to a 'just in time' approach to the supply of goods (a concept known as 'portcentrics'), to the benefit of regional and national trade competitiveness.

Figure 3 – Aerial image of the Port and Logistics Park at London Gateway

2.1.9 Chapter 2 of the Economic Impact Report supporting these Written Representations (Annex B) provides a comprehensive overview of the strategic, political and economic importance of DPWLG to the UK. The key headlines include:

(i) A combined £30bn of total trade (imports and exports) passed through the port in 2022, which equates to 4% of the UK total;

(ii) The Port is currently Britain's second biggest container terminal and is subject to rapid further expansion;

(iii) The Port is the premier port for handling temperature-controlled cargo, managing almost 50% of UK imports and 30% of exports;

(iv) In terms of values imported into the UK, in 2022, 29% of edible fruit and nuts and 23% of coffee, tea, mate and spices for the entire UK were imported into the Port, the highest of any UK port;

(v) The Logistics Park has potential to accommodate 829,700 sqm of commercial floorspace supporting over 13,000 jobs;

(vi) DPWLG is one of the most significantly privately funded projects in the UK over the last 30 years with over £2bn invested in the last decade and a further £1bn of investment earmarked for developing future infrastructure, facilities and technology.

2.2 EXISTING ACCESS ARRANGEMENTS

2.2.1 The Port and Logistics Park are accessed via an access road that leads directly from the Port to the A1014 onto the A13 via the Manorway Junction. This leads to the M25 and wider strategic highway network (route show in blue on the plan below). The A1014 from the Manorway Junction is the sole route of access to the Port and Logistics Park for freight traffic (all other local roads being inappropriate for such use and subject to weight restrictions). As such, uninhibited access along this route is fundamental to the successful operation of the Port and Logistics Park.

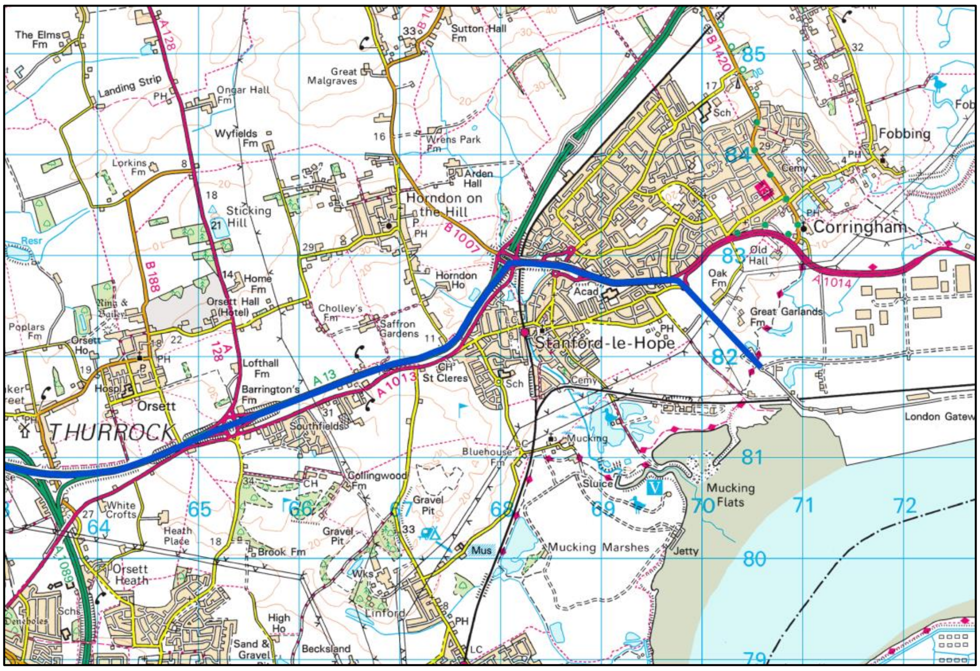

Figure 4 – Sole access route to DPWLG (shown in blue)

2.2.2 Prior to the first berth at the Port coming into operational use in November 2013, a total of approximately £10m was spent by DPWLG on a project to improve the Manorway Junction. A further £7.8 million was committed to improvements to Orsett Cock junction and widening of the A13 between 2016 and 2018. These improvements were designed to provide capacity for the Port and Logistics Park once fully developed. As such, this additional capacity on the highway network should remain available for the Port and Logistics Park.

2.3 OVERVIEW OF OPERATIONS AT THE PORT

2.3.1 The primary operation of the Port is the exchange of containers between container ships and Heavy Goods Vehicles ('HGVs'). This exchange is two-way with HGVs often arriving with containers to be transferred to container ships, and during the same allocated slot, HGVs receiving containers which have been decanted.

2.3.2 The diagram below (provided within the Economic Impact Report – Annex B) provides a basic illustration of the operations at the Port. A written summary is also provided below:

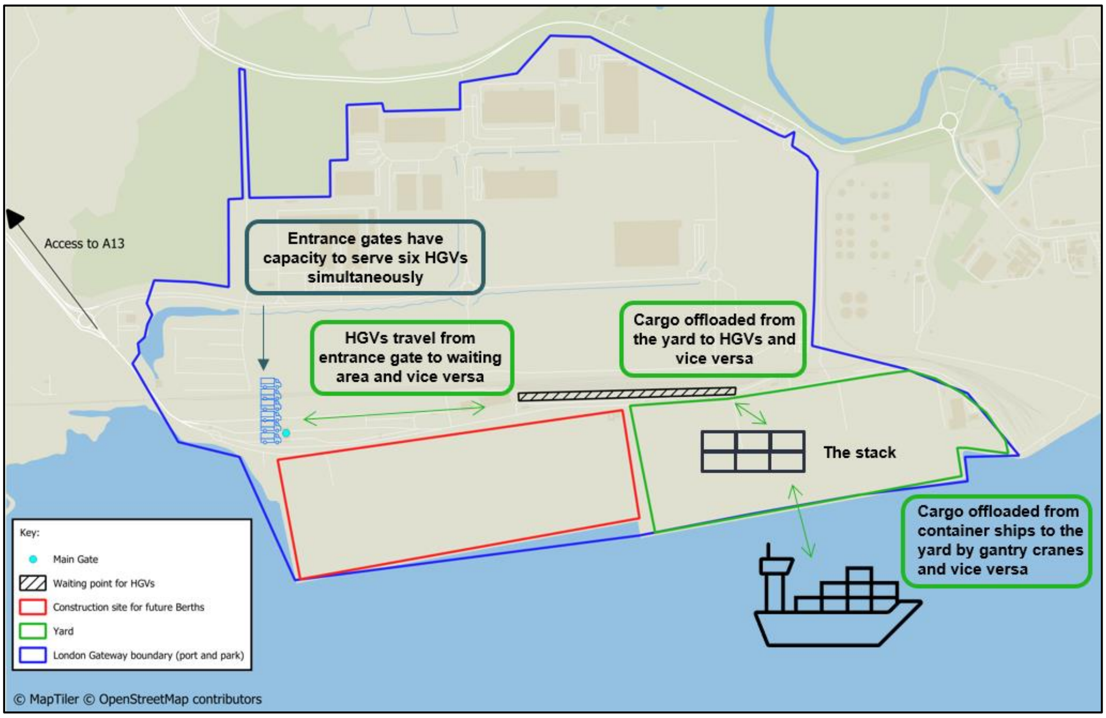

Figure 5 – Diagram of Operations of the Port (Economic Impact Report, Volterra)

(i) A 60-minute time slot is pre-booked for an HGV entering the site;

(ii) HGVs access the Port from the A1014 via the A13 and Manorway junction;

(iii) They arrive at the Port's entrance gates, where six HGVs can be processed for entrance at any one time;

(iv) Following customs checks, HGVs wait at the designated waiting point until receiving indication their container is ready;

(v) The HGV then reverses into an allocated bay. The container on the HGV is removed from the HGV and placed onto the stack (see above plan) by an automatic gantry crane. This is followed by the crane selecting a new container from the stack and placing it on the HGV.

(vi) Once secured, the HGV exits the port towards the A13 via the A1014 and the Manorway junction.

2.3.3 This process is highly automated, with an automatic software system operating the cranes to ensure containers are moved from the stack to the HGV in the most efficient manner possible to ensure minimum Truck Turnaround Times ('TTT').

2.4 EMERGENCY SYSTEMS AND EVACUATION STRATEGIES

2.4.1 In accordance with Action Point 4 of Issue Specific Hearing 1 ('ISH1') DPWLG have provided information that identifies aspects of the Port's emergency systems and evacuation strategies that have implications for the surrounding road network. This is provided at Annex C.

2.5 FUTURE EXPANSION OF THE PORT AND LOGISITCS PARK

2.5.1 As noted above, the HEO consents up to seven deep sea container berths serving (or alternatively 6 berths plus a RoRo facility). Three of the potential six berths authorised under the HEO are currently operational with a fourth due to open in 2024. The remaining two berths are expected to be constructed and brought into operation in line with market demand over the next decade.

2.5.2 The Logistics Park is the subject of a proposed second LDO ('LDO2') to extend the life of LDO1 (with an up-to-date assessment process) to realise the development potential of the Logistics Park in line with the original and continuing objectives.

2.5.3 Once fully developed, the Port will comprise deep sea shipping and container handling facilities with an annual throughput that will equate to approximately 27% of the predicted national growth in such trade by 2030. The Logistics Park will provide up to approximately 829,700 sqm of vital commercial floorspace.

2.5.4 The CGI image below indicates the extent of the Port and Logistics site once fully developed.

Figure 6 – CGI of Port once fully developed

2.5.5 As noted above, the 2013 improvements to the Orsett Cock and Manorway junctions and the A13 were designed to provide mitigation for the Port and Logistics Park once fully developed.

3.0 SUMMARY OF TRANSPORT AND ECONOMIC IMPACTS

3.1 Consequential Impacts of the LTC Project

3.1.1 As noted above, DPWLG has commissioned two separate but interrelated technical reports (Transport Report and Economic Impact Report at Annex A and B), which together provide an indicative assessment of the transport and economic impacts of the LTC Project on the operations of the Port and Logistics Park.

3.1.2 The Transport and Economic Impact Reports together illustrate a clear thread of consequential impacts that stem from the implementation of the LTC Project (as proposed) through to the adverse impacts on the operation of the Port and Logistics Park. These consequential impacts are summarised below:

(i) The LTC Project does not provide a direct link between the LTC Project and the A1089 leading to the Port of Tilbury.

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(ii) As such, any vehicles wishing to access the Port of Tilbury from the LTC must therefore U-turn at Orsett Cock junction.

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(iii) This will attract increased traffic along the A13 (to the east of the LTC) and lead to increased congestion at Orsett Cock junction. In this regard, DTA's Transport Report illustrates that the impact on the junction is significant and that by 2030 the overall capacity of the junction is significantly exceeded, resulting in significant queuing.

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(iv) Given the long queues (1.3km) that would be visible on the A13/LTC approach at peak times, it is highly likely that many drivers will decide (either through knowledge of the local highway or instructed to do so by a satnav system) to carry on along the A13 and U-turn at Manorway junction instead. This is particularly likely given the proximity of the two junctions (approx. 2 miles apart) and short drive time (typically between 5 and 8 minutes).

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(v) These changes in vehicle movements, shown graphically in the diagram below (see Appendix A of Transport Report), would place additional strain on the operational effectiveness of Manorway Junction, particularly as there is very little stacking space (only for two HGVs) on the gyratory to accommodate significant levels of traffic U-turning and allow access to the Port and Logistics Park. This is the case even without the Port and Logistics Park operating at full capacity.

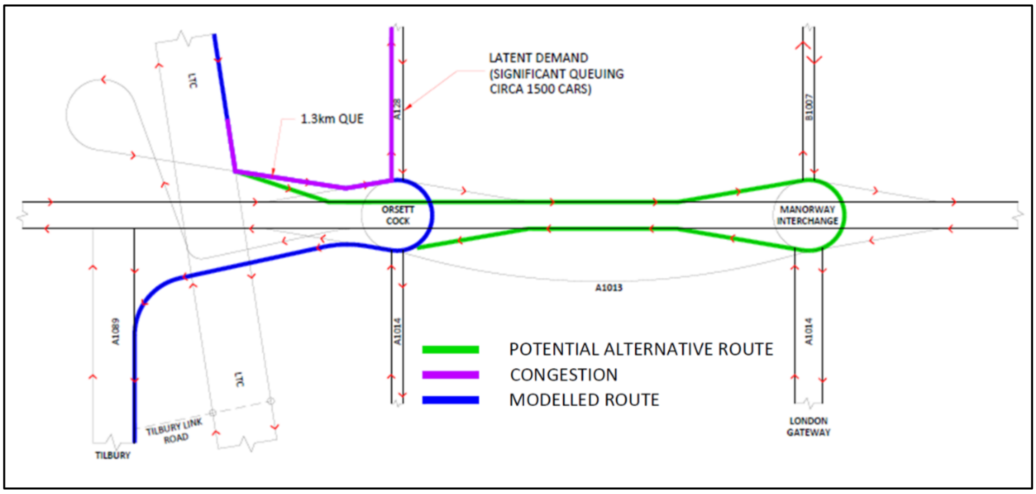

Figure 7 – Diagram illustrating the impacts of LTC on the Orsett Cock and Manorway Junctions (DTA Transport Report – Appendix A)

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(vi) The increased congestion at Manorway Junction would adversely impact on the operations of the Port as HGVs would be more likely to miss pre-booked drop-off or collection slots as a result of unreliable travel times. When unexpected delays occur, additional time is spent rearranging the container stack within the Port, which causes average Truck Turnaround Times ('TTT') to increase.

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(vii) If hauliers fail to arrive within their allocated time-slot, they are required to re-book and wait for a new time-slot. This results in increased operating costs for the hauliers and has an adverse impact on their reputation.

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(viii) The destination facilities receiving the freight are also adversely impacted as deliveries are delayed. This may lead to unproductive labour costs that would eventually get passed down to the end user.

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(ix) If the Port continues to be associated with access issues/ delays, its reputation would diminish. Hauliers would most likely be deterred from using the Port and opt to use other ports as a provider. It may also deter logistics operators from locating their operations at the Logistics Park.

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(x) This would ultimately have a detrimental impact on the competitiveness and resilience of the Port and Logistics Park and impact on its future growth and development, which is dependent upon on the maintenance of free-flowing access to ensure ongoing efficiency, as well as operational and economic resilience.

3.1.3 Together, the Transport and Economic Impacts reports indicate that the induced congestion and increased delays at the Orsett Cock and Manorway junctions would have adverse operational and economic impacts on the Port and Logistics Park, as well as knock-on effects for hauliers and end users. Given the strategic importance of the Port and Logistics Park to the national economy (as set in Section 2 of the Economic Impact Report) and the policy protection afforded to maintaining the resilience and competitiveness of national ports (as set out in the NPS for Ports), it is crucial that the LTC Project should, at the very least, maintain (and not hinder) the operational efficiency of the Port and Logistics Park.

3.1.4 The findings of the Transport and Economic Impacts reports are addressed in more detail throughout the following sections.

4.0 PRINCIPLE ISSUES

4.1 KEY AREAS OF CONCERN WITH THE APPLICANT'S DCO SUBMISSION

4.1.1 Having reviewed the DCO documents submitted by the Applicant, and in view of the findings of the technical reports commissioned by DPWLG (summarised in Section 3), we raise the following concerns regarding the Applicant's DCO Submission:

(i) **The Applicant has not satisfactorily assessed the congestion and capacity issues at the Orsett Cock (A13/A128) and Manorway (A13/A1014) junctions, the latter of which is located along the sole access route to the Port and Logistics Park -** The Transport Report (Annex A) highlights that insufficient information has been submitted in respect of the impact on the junctions and to assess whether mitigation is required. DPWLG has repeatedly requested that the Applicant undertakes detailed modelling of the junctions. However, this has been deemed unnecessary by the Applicant. As such, the ExA and SoS cannot give due consideration to the impacts on the local transport network near to the Port and Logistics Park (as required by paragraph 5.211 of the NPS for National Networks – See Section 5). In particular:

- The Lower Thames Area Model (LTAM) is insufficiently detailed to suitably assess the impact of the LTC Project on the Orsett Cock and Manorway junctions. More detailed and localised modelling of the junctions provided by the Applicant to Thurrock Borough Council identifies significant additional congestion at the Orsett Cock Junction, which will in turn create increased traffic at the Manorway Junction. The Applicant has not submitted any localised modelling information as part of the application;
- The Applicant has not considered circumstances where the Dartford Crossing (QE2 Bridge) is suffering significant congestion or is closed to traffic (for example because of high winds). In such a scenario, the level of traffic rerouting affecting the Orsett Cock and Manorway Junctions would be extremely significant.

It is noted that at Issue Specific Hearing 1 ('ISH1'), Mr Young of the ExA Panel stated that it was '*highly likely*' that the Panel would need to see additional information from the Applicant in relation to more localised modelling of the Orsett Cock Junction (ISH1 Transcript, Page 93, Line 29). It is also noted that Action Points 8, 9 and 10 following ISH1 require the Applicant to provide: (i) a summary of requests for localised traffic modelling data and specific intersection modelling; (ii) a summary list of local intersections for which localised traffic modelling has been completed; and

(iii) the criteria to determine how to respond to requests for local / micro modelling of intersections.

(ii) **The findings of DTA's Transport Report (Annex A) shows that the LTC Project, as proposed, would have a significant adverse impact on the highway network and junctions serving the Port and Logistics Park** – detailed modelling of the Orsett Cock and Manorway junctions (which has not been submitted by the Applicant) identifies significant additional congestion at the Orsett Cock junction, which will in turn cause significant levels of traffic to re-route via the Manorway junction. This demonstrably conflicts with the outputs of the LTAM model submitted by the Applicant and demonstrates a significant adverse impact on the operation of the Manorway junction, which serves the Port and Logistics Park.

(iii) **The induced congestion and increased delays at the Orsett Cock and Manorway junctions would have consequential impacts on the operation of the Port and Logistics Park, as well as knock-on effects for hauliers and end users. This has not been considered by the Applicant –** As the Applicant has failed to consider the significant adverse impacts of the Orsett Cock and Manorway junctions, it follows that they have failed to take account of the consequential impacts on the operations of the Port and Logistics Park. As outlined in Section 3, an increase in unreliable travel times would adversely impact on the operations of the Port through missed drop-off or collection slots. This in turn would adversely impact the operations of hauliers/ end users that rely upon the efficient operation of the Port. Given the particular emphasis that is placed on maintaining the resilience and competitiveness of national ports (as set out in NPS for Ports), it is crucial that the ExA and SoS take account of any unintended detrimental impacts on the Port and Logistics Park. The Project should, at the very least, maintain (and not hinder) the operational efficiency of the port and park, in the national interest.

(iv) **The mitigation measures proposed by the Applicant in respect of the Orsett Cock and Manorway Junctions are insufficient and unacceptable** - The Applicant proposes to undertake ongoing monitoring of the Orsett Cock and Manorway junctions, rather than implement suitable mitigation measures as part of the LTC Project. Furthermore, there is no known available funding or land agreements in place to deliver mitigation should the proposed monitoring identify significant impacts at these junctions. Schematic concept plans of each junction showing potentially suitable mitigation measures are provided in DTA's Transport Report (Annex A) and summarised in Section 6 of this Statement.

The Economic Impact Report (Annex B) highlights that, even based on highly conservative assumptions, resolving the adverse impacts on the Port and Logistics Park through appropriate mitigation measures would strengthen the case for the Project and deliver good Value for Money (‘VfM’).

5.0 PLANNING POLICY ASSESSMENT

5.1 POLICY FRAMEWORK

5.1.1 Section 104(2) of the Planning Act 2008 states that in deciding an application for an order granting development consent, the SoS must have regard to:

(a) any relevant National Policy Statements ('NPS');

(b) any appropriate marine policy documents;

(c) any Local Impact Report ('LIR') submitted to the SoS;

(d) any matters prescribed in relation to development of the description to which the application relates; and

(e) any other matters which the SoS thinks are both important and relevant to the SoS's decision.

5.1.2 It is noted that whilst the **National Policy Statement for National Networks (NPS for National Networks) (2014)** will take primacy in the determination of this application, other NPSs are also relevant. (NPS for National Networks, paragraph 1.2). In this respect, significant weight should be attached to the **National Policy Statement for Ports (NPSP) (2012)** as an 'important and relevant' consideration under section 104(2)(e) given the proximity of the LTC Project to two nationally significant ports (DPWLG and Port of Tilbury) and in light of the consequential impacts of the Project on the Port, as outlined in Section 3 and 4 of this Statement.

5.1.3 The NPS for Ports sets out the Government's support for the growth and development of the UK's port infrastructure and references their '*essential role*' (paragraph 3.1) in the national economy. It places particular emphasis on maintaining the resilience and competitiveness of national ports through enhanced access. The NPS for Ports is in the process of being revised, and the likelihood is that this emphasis will gain even greater weight due to the emergence of free ports and their importance to the UK's economic future.

5.1.4 The **National Policy Statements for energy infrastructure** are relevant insofar as the proposed LTC requires the diversion of an existing overhead powerline and gas pipelines. The **National Planning Policy Framework (NPPF) (2021)** is also identified as an important and relevant consideration in decisions on NSIPs insofar that it is relevant to a particular the Project (NPS for National Networks, paragraph 1.18). Likewise, the **Road Investment Strategy 2: 2020 – 2025,** which sits alongside the NPS for National Networks, is also considered to be an important and relevant consideration in the determination of this Project.

5.1.5 We set out below our assessment of the LTC Project against the guidance contained in the aforementioned policy documents insofar as it is relevant to the operations of the Port and Logistics Park. For ease of reference, our comments are provided in a table format alongside reference to the relevant parts of the guidance.

5.2 COMPLIANCE WITH NATIONAL POLICY STATEMENT FOR NATIONAL NETWORKS

Paragraph	Summary of Guidance	LSH Comments
1.2	The SoS must decide an application for a national networks NSIP project in accordance with the National Networks NPS unless he/she is satisfied that to do so would (amongst other things) '*result in adverse impacts of the development outweighing its benefits*' (bullet point 4).	As evidenced in the DTA Transport Report, without appropriate mitigation, the LTC Project would have a significant adverse impact on the highway network serving the Port and Logistics Park. This in turn would have negative consequential impacts for the operations of the Port and Logistics Park, hauliers and the receivers of goods. Given the national economic significance of national ports and the need to maintain their resilience and competitiveness (as set out in NPS for Ports) any adverse impacts on the operations of the Port and Logistics Park should be afforded significant weight by the SoS when considering the proposed development.
Chapter 2	The vision and strategic objectives for national networks states (amongst other things) that the Government will deliver national networks that meet the country's long term needs and support a prosperous and competitive economy. This means networks with the capacity and connectivity and resilience to support national and local economic activity and facilitate growth and create jobs.	The vision and objectives for national networks should be considered alongside the guidance of NPS for Ports (2012) which places particular emphasis on maintaining the resilience and competitiveness of national ports through enhanced access. As evidenced in the supporting technical reports (Annex A and B), without appropriate mitigation, the LTC Project would have an adverse impact on the operations of the Port, Logistics Park, as well as hauliers and the receivers of goods. In this respect, the LTC Project would conflict with the strategic vision and objectives of the NPS for National Networks.

2.16	Traffic congestion constrains existing economic activity as well as economic growth, by increasing costs to businesses, damaging their competitiveness and making it harder for them to access export markets. Businesses regularly consider access to good roads and other transport connections as key criteria in making decisions about where to locate.	This ExA Panel and SoS should have regard to this paragraph in respect of the operations of the Port and Logistics Park, a nationally significant economic asset for which good access roads and transport connections are fundamental to its ability to operate efficiently. Any adverse impact on access to the Port and Logistics Park is significant given the status of ports in national policy (NPS for Ports). As set out in paragraph 2.16, '*Traffic congestion constrains existing economic activity as well as economic growth, by increasing costs to businesses, damaging their competitiveness and making it harder for them to access export markets'.* This is particularly true for port and logistics park operators.
4.3	In considering any proposed development, the ExA and SoS should take into account: (i) its potential benefits, including the facilitation of economic development, including job creation, housing and environmental improvement, and any long-term or wider benefits; (ii) its potential adverse impacts, including any longer-term and cumulative adverse impacts, as well as any measures to avoid, reduce or compensate for any adverse impacts.	This is an important paragraph in considering the balance between the potential benefits and adverse impacts of the LTC Project. It is acknowledged that the LTC Project will deliver benefits to the wider network in relation to increased highway capacity and network resilience for north/ south routes (alternative to Dartford Crossing) and the wider time/ cost savings this will bring, which is in the public interest. However, this cannot be at the expense of any adverse impacts on the operations of the Port and Logistics Park, a national economic asset of significant economic importance. In considering the potential benefits against the adverse impact, it is particularly relevant to note that the core initial benefit-cost-ratio (BCR) of the Project is 0.48 (poor), and the core adjusted BCR is just 1.22 (low). This should be considered alongside the protection afforded to maintaining the

		competitiveness and resilience of national ports (NPS for Ports), which must be given substantial weight in the decision-making process.
5.211 – 5.212	In making a decision, the ExA and SoS should give due consideration to impacts on local transport networks. Road schemes should take into account local models where appropriate.	The Applicant has relied upon modelling from the Lower Thames Area Model (LTAM). This is a strategic highway model that does not provide the level of detail and accuracy at local junctions to allow the ExA and SoS to give due consideration to the impacts on the local transport network near to the Port and Logistics Park. Further localised modelling data from the Applicant was requested by the ExA Panel at the ISH1 (Transcript, Page 93, Line 29). However, the Applicant is yet to provide this information at the time of writing.
5.215 – 5.217	Mitigation measures for schemes should be proportionate and reasonable, focused on promoting sustainable development. Where development would worsen accessibility such impacts should be mitigated so far as reasonably possible. Mitigation measures may relate to the design, lay-out or operation of the scheme.	The mitigation measures proposed by the Applicant in respect of the Orsett Cock and Manorway Junctions are insufficient and unacceptable and do not accord with the requirements of paragraphs 2.215 – 2.217. The Applicant proposes to undertake ongoing monitoring of these critical junctions, rather than implement suitable mitigation measures. This approach would not secure any mitigation prior to the completion of the LTC, if at all. As such, any provision of mitigation is intrinsically uncertain. It would also place responsibility for identifying the impacts (and seeking the necessary funding) onto local authorities, rather than National Highways. In accordance with paragraphs 2.215 and 2.17, the Applicant must provide for and deliver suitable mitigation measures at the Orsett Cock and Manorway junctions.

5.3 COMPLIANCE WITH NATIONAL POLICY STATEMENT FOR PORTS (2012)

Paragraph	Summary of Guidance	LSH Comments
1.2.1	Clarifies that NPS for Ports applies wherever relevant to associated development, such as road and rail links.	Given the proximity of the Port, NPS for Ports is considered to be an 'important and relevant' consideration under section 104(2)(e) of the Planning Act 2008.
3.1	Sets out the Government's support for the growth and development of the UK's port infrastructure and references their 'essential role' in the UK economy.	The ExA and SoS should give substantial weight to the competitiveness and resilience of the Port given the essential role it plays in the UK economy.
3.1.4	For an island economy, there are limited alternatives available to the use of sea transport for the movement of freight and bulk commodities……… As a consequence, shipping will continue to provide the only effective way to move the vast majority of freight in and out of the UK, and the provision of sufficient seaport capacity will remain an essential element in ensuring sustainable growth in the UK economy.	Again emphasises the essential role and significance of ports to the national economy and, therefore, the substantial weight that must be given to maintaining their competitiveness and resilience.
3.1.7	By bringing together groups of related businesses within and around the estate, ports also create a cluster effect, which supports economic growth by encouraging innovation and the creation and development of new business opportunities. And new investment, embodying latest technology and meeting current needs, will tend to increase the overall sector productivity.	This emphasises the wider economic benefits of ports outside of their own operation. The ExA and SoS should note that the LTC Project, as proposed, would not only impact the operation of the Port, but also the adjacent Logistics Park and the recently approved Thames Enterprise Park, and the Coryton oil refinery expansion. Together this equates to 85% of the allocated employment land for Thurrock.
3.3.1	States that the Government seeks to encourage sustainable port development to cater for long term forecast growth in volumes of imports and exports by sea with a competitive and efficient port industry capable of meeting the needs of importers and exporters cost effectively and in a timely	This emphasises the Government's support for the growth and development of the UK's port infrastructure, ensuring their competitiveness and efficiency, and highlights their importance to the UK's economic future.

	manner, thus contributing to long term economic growth and prosperity.	The continued growth and development of the Port and Logistics Park can only be achieved if its efficient operation is able to continue unaffected.
3.3.3	In order to help meet the requirements of the Government's policies on sustainable development, new port infrastructure should (amongst other things) enhance access to ports and the jobs, services and social networks they create.	This makes clear that access to ports should be enhanced, rather than constrained. Without appropriate mitigation, the LTC Project would have an adverse impact on access to the Port and Logistics Park.
3.4.13 – 3.4.15	Notes the importance of competition and for UK ports to be competitive, both with each other and ports in continental Europe as a mechanism to drive and reduce supply chain costs. It also cites the need for resilience to account for short term demand peaks, the impact of adverse weather conditions, accidents, deliberate disruptive acts and other operational difficulties without causing economic disruption through impediment to the flow of imports and exports	This highlights the importance of maintaining competitive and resilient national port facilities. The LTC Project, as proposed, would undermine the competitiveness and resilience of the Port as the induced congestion at the Orsett Cock and Manorway junctions would lead to unreliable travel times that would adversely impact on the operations of the Port through missed drop-off or collection slots. This in turn would adversely impact the operations of hauliers/ end users that rely upon the efficient operation of the Port. In incidences of bad weather when many other ports close, the Port at London Gateway (owing to its sheltered location and automated systems) can continue to operate and serve vessels that need to reroute. However, the LTC Project has the potential to significantly impact (effectively close) the Port during these incidences, exactly when it is providing resilience to the UK economy.

5.4 NATIONAL POLICY STATEMENTS FOR ENERGY INFRASTRUCTURE

5.4.1 The National Policy Statements for Energy Infrastructure are relevant insofar as the proposed LTC requires the diversion of existing overhead powerlines and existing gas pipelines.

5.4.2 Whilst we do not provide a summary of the NPS documents here, it is notable that the NPS for Renewable Infrastructure (EN-3) emphasis the economic importance of ports. In this respect paragraph 2.6.162 of EN-3 makes clear that disruption or economic loss to shipping and navigation should be given 'substantial weight' in decision-making for renewable infrastructure projects:

"The [Secretary of State] should be satisfied that the site selection has been made with a view to avoiding or minimising disruption or economic loss to the shipping and navigation industries with particular regard to approaches to ports and to strategic routes essential to regional, national and international trade, lifeline ferries and recreational users of the sea. ***Where a proposed development is likely to affect major commercial navigation routes, for instance by causing appreciably longer transit times, the [Secretary of State] should give these adverse effects substantial weight in its decision making*** (our emphasis)*".*

5.5 NATIONAL PLANNING POLICY FRAMEWORK

5.5.1 The NPPF and Planning Practice Guidance (PPG) are identified as an important and relevant consideration in decisions on NSIPs insofar that it is relevant to a particular the Project (NPS for National Networks, paragraph 1.18).

5.5.2 Given the limited relevance of the NPPF in the decision-making process, we do not provide a detailed summary here. However, we highlight that one of the overarching objectives of the NPPF (paragraph 8) is to '*help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure'*.

5.5.3 Paragraph 187 of the NPPF is also notable in that sets out the 'agent of change' principle which states *'…..Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established'*. The agent of change principle aligns with paragraphs 2.215 and 2.217 of NPS for National Networks, which requires the Applicant to deliver proportionate and reasonable mitigation measures.

5.6 ROAD INVESTMENT STRATEGY 2 (RIS2): 2020 – 2025

5.6.1 The RIS2 sits alongside the NPS for National Networks and is, therefore, an important and relevant consideration. It confirms the importance of reliable, predictable, rapid access to ports with one of the overarching aims for the Strategic Road Network ('SRN') being to improve links to ports.

5.6.2 An element of the vision of the Strategic Road Network (SRN) in 2050 is that it supports the freight and logistics industry, and continues to carry more freight than any other part of the transport system. In order to achieve this vision, RIS2 must take into account the strategic importance to the economy of freight moved by road by supporting the specific needs of HGV traffic on the SRN.

5.6.3 RIS2 specifies the following performance standard: *'For average delay we have set an ambition for performance at the end of RP2 to be no worse than at the end of RP1.'* A performance indicator cited as being used as evidence to determine the fulfilment of this ambition is: '*Delays on gateway routes: average delay (seconds per vehicle mile) observed on gateway* [port and airports] *routes compared to all vehicles travelling at speed limit.*'

5.6.4 RIS2 also outlines plans for the A13 and A1014 to be trunked between the existing trunked section of the A13 (the A13 west of the existing junction with the A1089) and the Port and Logistics Park. This would result in this section of highway being the responsibility of the Applicant.

5.6.5 Given the above, the Applicant has a responsibility to ensure the enhancements included in RIS2 – of which the LTC Project is one – do not increase delay on the A13, Manorway Junction, and A1014. However, the DTA Transport Report demonstrates increases in delay at Manorway Junction as a direct result of the LTC Project. As such, the Applicant's approach to mitigation proposals is contrary to the requirements of RIS2.

5.7 PLANNING POLICY ASSESSMENT SUMMARY

5.7.1 The NPS for Ports (2012) sets out the Government's support for the growth and development of the UK's port infrastructure and references their '*essential role*' in the national economy. It places particular emphasis on maintaining the resilience and competitiveness of national ports through enhanced access. The NPS for Ports is in the process of being revised, and the likelihood is that this emphasis will gain even greater weight due to the emergence of freeports and their importance to the UK's economic future. As such, the ExA and SoS must give substantial weight to the importance that government policy places on maintaining efficient, competitive and resilient national ports.

5.7.2 It is acknowledged that the LTC Project will deliver benefits to the wider network in relation to increased highway capacity and network resilience for north/ south routes (alternative to Dartford Crossing) and the wider time/ cost savings this will bring, which is in the public interest. Indeed, DPWLG support in-principle the delivery of the LTC Project. However, in accordance with paragraph 4.3 of the NPS for National Networks, the benefits of the Project need to be balanced against any adverse impacts, including any measures to avoid, reduce or compensate for any adverse impacts.

5.7.3 It is clear that the LTC Project, as proposed, fails to accord with the requirements of the NPS for National Networks in relation to the provision of 'proportionate and reasonable' mitigation measures (paragraph 5.215 – 5.217). In this respect, the Applicant's proposes to undertake ongoing monitoring of critical junctions (including Orsett Cock and Manorway). However, monitoring is not mitigation, and cannot be considered to be 'proportionate and reasonable' mitigation solution. This is particularly notable given the adverse impacts that would arise in relation to the operation of the Port and Logistics Park as a result of congestion at the Orsett Cock and Manorway junctions.

5.7.4 The lack of mitigation provided is intrinsically linked to the lack of local modelling information submitted by the Applicant. In this respect, the Applicant has relied upon strategic highway modelling (LTAM) that does not provide the level of detail and accuracy at local junctions to allow the ExA and SoS to give proper consideration to the impacts on the local transport network in relation to the Port and Logistics Park, as required by the NPS for National Networks (paragraph 5.211 – 5.212). It is, therefore, important for the ExA and SoS to consider whether these junctions have been modelled appropriately and has the evidence upon which to make a proper assessment in respect of the appropriateness of the Project in the absence of a detailed assessment and the consideration of appropriate mitigation measures. In our view, it is unreasonable that the Applicant has failed to provide detailed modelling for junctions which (by their own assessment) will require protectionary monitoring in the event the Project goes ahead.

5.7.5 In considering the overall planning balance (i.e. the wider public benefits of the LTC Project against its adverse impacts), the ExA and SoS (in accordance with the guidance set out in the NPS for National Networks and NPS for Ports) must give careful consideration to the adverse impacts that would occur at the Orsett Cock and Manorway junctions in relation to the safe and efficient operation of those junctions, and in respect of the consequential impacts on the Port and Logistics Park without appropriate mitigation. This should be considered in the context of the poor/ low benefit-cost-ratio (BCR) of the LTC Project, together with the policy protection afforded to maintaining the competitiveness and resilience of national ports (NPS for Ports).

5.7.6 Compliance with the relevant NPS guidance can only be achieved if the effects on the Orsett Cock and Manorway junctions are fully assessed and mitigated such that the operation of the Port and Logistics Park is not undermined by congestion and journey time increases caused by the LTC Project. The objective must be to maintain, if not enhance, resilience if policy objectives are to be met.

5.7.7 For the reasons set out above, we consider that the LTC Project (as proposed) does not comply with the requirements of the NPS for National Networks or the NPS for Ports.

6.0 PROPOSED MITIGATION MEASURES

6.1 Summary of The Applicant's Mitigation Strategy in relation to Orsett Cock and Manorway Junctions

6.1.1 As set out in Section 5, rather than providing a clear mitigation strategy in relation to the Orsett Cock and Manorway junctions, the Applicant proposes to implement a traffic impact monitoring scheme (outlined within 7.12 Wider Network Impacts Management and Monitoring Plan – Ref: APP-545). This requires traffic monitoring to be carried out during the operational phase of the Project to identify any changes in performance on the junctions and surrounding road network.

6.1.2 The Applicant's approach is contrary to the requirements of the NPS for National Networks, which requires NSIP projects to deliver '*proportionate and reasonable'* mitigation and, where development would worsen accessibility, for such impacts to be mitigated '*so far as reasonably possible'*. Simply monitoring the surrounding network/ junctions provides no guarantee of any mitigation being delivered at any time. In this respect, mitigation can only be certain where there is a mechanism to deliver resolutions and resolve the impacts.

6.1.3 The Applicant's approach also places responsibility for identifying the impacts (and seeking the necessary funding) onto local authorities, rather than National Highways. In this respect, there is no known available funding in place to deliver mitigation should the proposed monitoring identify significant impacts at the Orsett Cock and Manorway junctions.

6.1.4 Given the above, we consider that the mitigation measures proposed by the Applicant in respect of the Orsett Cock and Manorway Junctions are insufficient, unacceptable and are not in accordance with the guidance contained in NPS for National Networks.

6.2 PROPOSED MITIGATION STRATEGY

6.2.1 The Transport Report concludes (based on additional transport assessment work) that further assessment of the Orsett Cock and Manorway junctions is required to determine whether and what type of mitigation measures are required to alleviate the significant adverse impacts identified. In this regard, the Transport Report includes schematic concept plans for each junction showing potentially suitable mitigation measures. These are provided below.

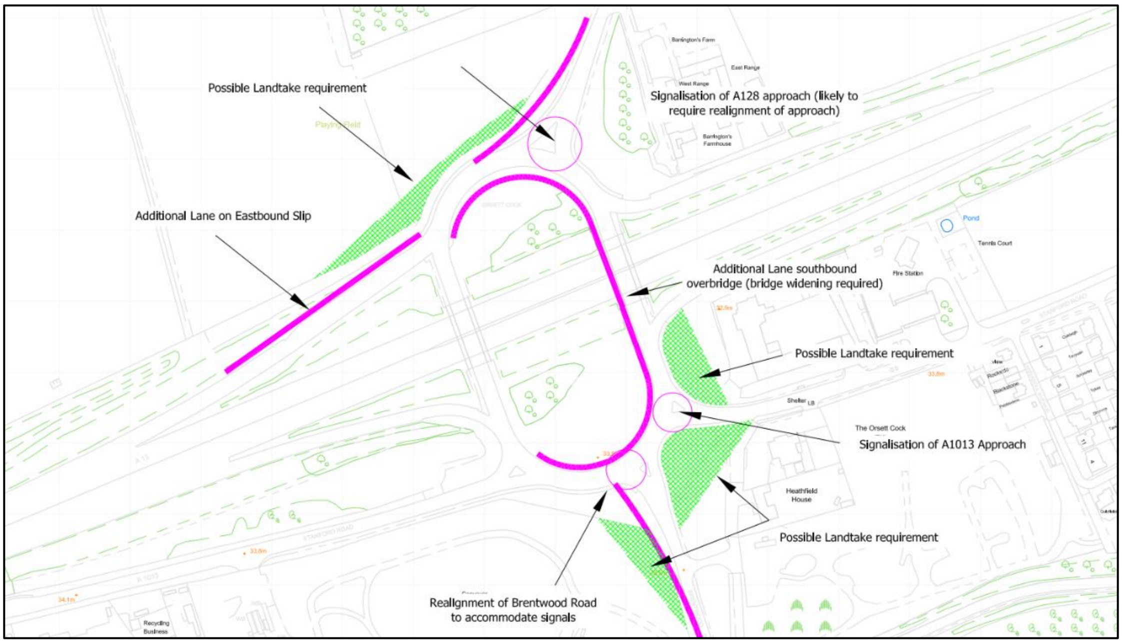

Figure 8 – Concept Mitigation Scheme for Orsett Cock

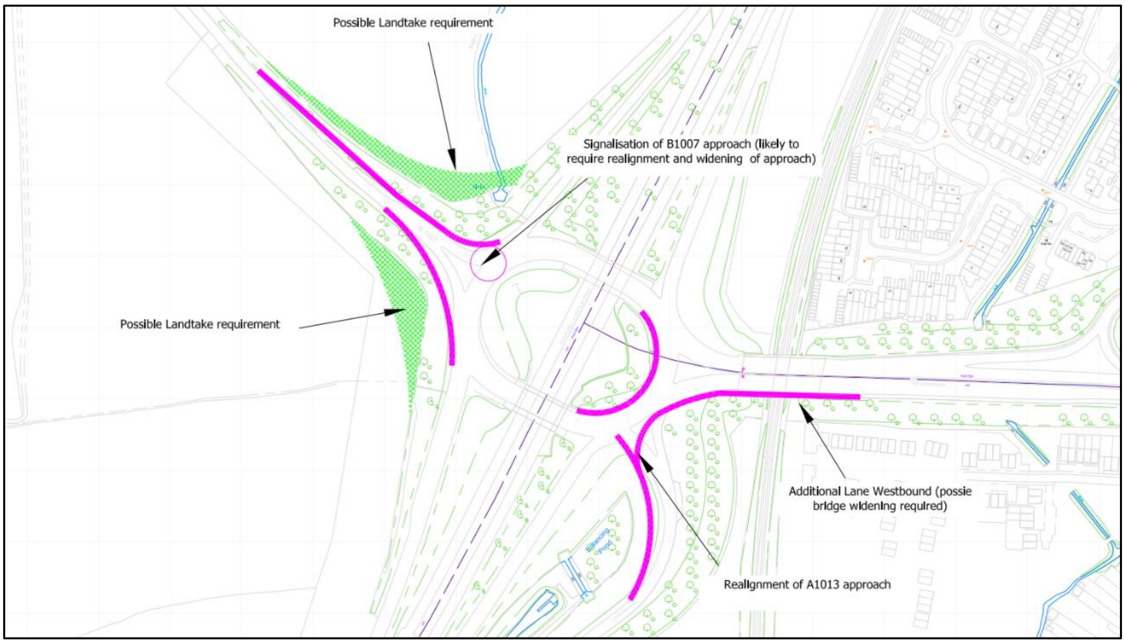

Figure 9 – Concept Mitigation Scheme for Manorway

6.2.2 Both concept schemes are schematic at this stage and would be subject to the Applicant carrying out further work in relation to modelling and design. However, they serve to indicate how appropriate mitigation measures could be implemented at both junctions.

6.2.3 These mitigation measures could be avoided altogether if a direct link to the Tilbury area from the LTC was provided as part of the Project as this would avoid the need for vehicles to U-turn at Orsett Cock junction.

Although this option appears to have been discounted at an early stage by the Applicant (on the grounds of cost), this decision was made some time in advance of the completion of the traffic modelling and should be reconsidered.

6.2.4 The analysis presented in the Economic Impact Report (Annex B) demonstrates that, even based on highly conservative assumptions, resolving the economic disbenefits to the Port and logistics Park through appropriate mitigation proposals (such as the concept mitigation schemes above) would strengthen the case for the LTC Project and deliver good Value for Money ('VfM') for the taxpayer. There is, therefore, a clear economic and strategic case for implementing mitigation for the Project's impacts on Orsett Cock and Manorway junctions.

6.3 Procedural Implications of any Requirement to Deliver Mitigation

6.3.1 Whilst Orsett Cock Junction lies within the Order Limits of the DCO, the mitigation measures proposed in the Concept Plan above would require land take/ physical works outside of the boundary of the Order Limits. Manorway Junction falls entirely outside of the Order Limits of the DCO.

6.3.2 In the event that the ExA/ SoS determine that mitigation measures in relation to highway works at Orsett Cock and Manorway junctions (outside the Order Limits of the DCO) are necessary, consideration would need to be given to the mechanisms that might be legally applied, either through the Order or another process (e.g. by the imposition of an appropriate condition), to ensure that such works are delivered prior to the operation of the LTC Project. In this regard, the mitigation works set out in the schematic concept plan above would likely need planning permission, possibly side road orders in the event of further A13 trunking and the compulsory acquisition of land outside the Order Limits of the DCO. Considerations relevant for the imposition of any condition requiring these matters to be achieved prior to the opening of the project would also need to embrace the timing of the delivery of these works, and whether there is a reasonable likelihood of them being delivered in accordance with the timescales of the LTC Project.

6.3.3 The ExA would need to review the draft DCO (Schedule 2, part 1) to assess whether the attendant changes required to guarantee the delivery of mitigation at the Orsett Cock and Manorway junctions can be incorporated within the DCO.

6.3.4 It is considered that the proposed mitigation measures could be secured via a Grampian type condition which would prohibit the LTC Project coming into operation until the necessary mitigation works required at the Orsett Cock and/or the Manorway junctions have been completed.

6.3.5 If the required mitigation measures cannot be achieved through such means, the LTC Project (as proposed) should be refused as it would fail to comply with the relevant NPS guidance, specifically paragraphs 5.215 – 5.217 of NPS for National Networks which requires the LTC Project to deliver '*proportionate and reasonable'* mitigation measures.

6.3.6 As set out in Section 5 (Planning Policy Assessment), compliance with the relevant NPS guidance can only be achieved if the effects on the Orsett Cock and Manorway junctions are fully assessed and mitigated such that the resilience and competitiveness of the Port and Logistics Park is not undermined by congestion and journey time increases caused by the LTC Project.

7.0 SUMMARY AND CONCLUSIONS

7.1 OVERVIEW

7.1.1 Whilst DPWLG have no in-principle objection to the LTC Project and acknowledges the wider transport network benefits it would deliver, they have significant concerns in relation to the induced congestion and delays that would arise at the Orsett Cock and Manorway junctions as a direct result of the LTC Project. This would cause unreliable travel times to and from the Port and Logistics Park, which in turn would result in considerable disruption and uncertainty for its users.

7.1.2 The information submitted by the Applicant is insufficient in relation to the assessment of the Orsett Cock and Manorway junctions and the consequential impacts on the Port and Logistics Park as a direct result of the LTC Project. As such, DPWLG has commissioned the following technical reports:

- Written Representations in relation to Traffic Impact Assessment undertaken by DTA Transportation Ltd. ('Transport Report') (Annex A);
- Written Representations in relation to Economic Impact undertaken by Volterra ('Economic Impact Report') (Annex B).

7.1.3 These reports provide an indicative assessment (based on the information available to date) of the transport and economic impacts of the LTC Project on the operations of the Port and Logistics Park. Their findings have informed these Written Representations.

7.2 PRINCIPAL ISSUES

7.2.1 Based on our review of the DCO Submission and the findings of the above technical reports, DPWLG raise the following concerns regarding the LTC Project and the DCO Submission:

i) The Applicant has not satisfactorily assessed the congestion and capacity issues at the Orsett Cock and Manorway junctions. In this respect, the Applicant has not provided local modelling data in relation to the junctions and has not considered circumstances where the Dartford Crossing (QE2 Bridge) is suffering significant congestion or is closed to traffic;

ii) The indicative findings of DTA's Transport Report (Annex A) shows that the LTC Project, as proposed, would have a significant adverse impact on the highway network and junctions serving the Port and Logistics Park;

iii) The induced congestion and increased delays at the Orsett Cock and Manorway junctions would have consequential impacts on the operation of the Port and Logistics Park, as well as adverse knock-on effects for hauliers and end users. This has not been considered by the Applicant;

iv) The mitigation measures proposed by the Applicant in respect of the Orsett Cock and Manorway Junctions (i.e. ongoing monitoring) are insufficient and unacceptable.

7.3 PLANNING POLICY ASSESSMENT

7.3.1 The LTC Project, as proposed, fails to accord with the relevant guidance of the NPS for National Networks (2014) and NPS for Ports (2012), specifically:

i) The Applicant has relied upon strategic highway modelling (LTAM) that does not provide the level of detail and accuracy at local junctions to allow the ExA and SoS to give due consideration to the impacts on the local transport network near to the Port and Logistics Park, as required by paragraph 5.211 – 5.212 of the NPS for National Networks;

ii) The LTC Project fails to provide '*proportionate and reasonable'* mitigation measures required by paragraph 5.215 – 5.217 of NPS for National Networks;

iii) Without appropriate mitigation, the LTC Project would undermine the competitiveness and resilience of the Port which would be conflict with the Government's policy for ports as set out at paragraphs 3.4.13 – 3.4.15 of NPS for Ports;

iv) In considering the wider public benefits of the LTC Project against its adverse impacts (in line with paragraph 4.3 of NPS for National Networks), careful consideration must be given to the adverse impacts that would occur at the Orsett Cock and Manorway junctions in relation to the safe and efficient operation of those junctions, and in respect of the consequential impacts on the Port and Logistics Park. These should be considered in the context of the poor/ low benefit-cost-ratio (BCR) of the LTC Project, together with the policy protection afforded to maintaining the competitiveness and resilience of national ports (NPS for Ports).

7.3.2 Compliance with the relevant NPS guidance can only be achieved if the effects on the Orsett Cock and Manorway junctions are fully assessed and mitigated such that the operation of the Port and Logistics Park is not undermined by congestion and journey time increases caused by the LTC Project.

7.4 PROPOSED MITIGATION

7.4.1 The DTA Transport Report concludes (based on additional transport assessment work) that further assessment of the Orsett Cock and Manorway junctions is required to determine whether and what type of mitigation measures are required to alleviate the significant adverse impacts identified. Schematic concept plans for each junction showing potentially suitable mitigation measures are provided within the Transport Report (and Section 6 of this Statement).

7.4.2 The Economic Impact Report indicates that appropriate mitigation measures (such as those shown in the schematic concept plans) would strengthen the case for the LTC Project and deliver good Value for Money (‘VfM’) for the taxpayer. However, irrespective of VfM considerations, there is clear strategic rationale for delivering mitigation proposals given the importance of maintaining the resilience of the Port and Logistics Park, in line with the national policy objectives.

7.4.3 It is considered that the proposed mitigation measures could be secured via some form of Grampian condition, which would prohibit the LTC Project coming into operation, until the necessary mitigation works required at the Orsett Cock and Manorway junctions have been completed.

ANNEX A

WRITTEN REPRESENTATION IN RELATION TO TRAFFIC IMPACT

ANNEX B

WRITTEN REPRESENTATION IN RELATION TO ECONOMIC IMPACT

ANNEX C

EMERGENCY SYSTEMS AND EVACUATION STRATEGIES

Lower Thames Crossing

Written Representation in relation to

Traffic Impact on behalf of DPWLG

Transport Planning Consultants

Lower Thames Crossing

Written Representation on Transport Matters

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Prepared for:

DPWLG

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SJT/20491-02_Transport Issues - Final

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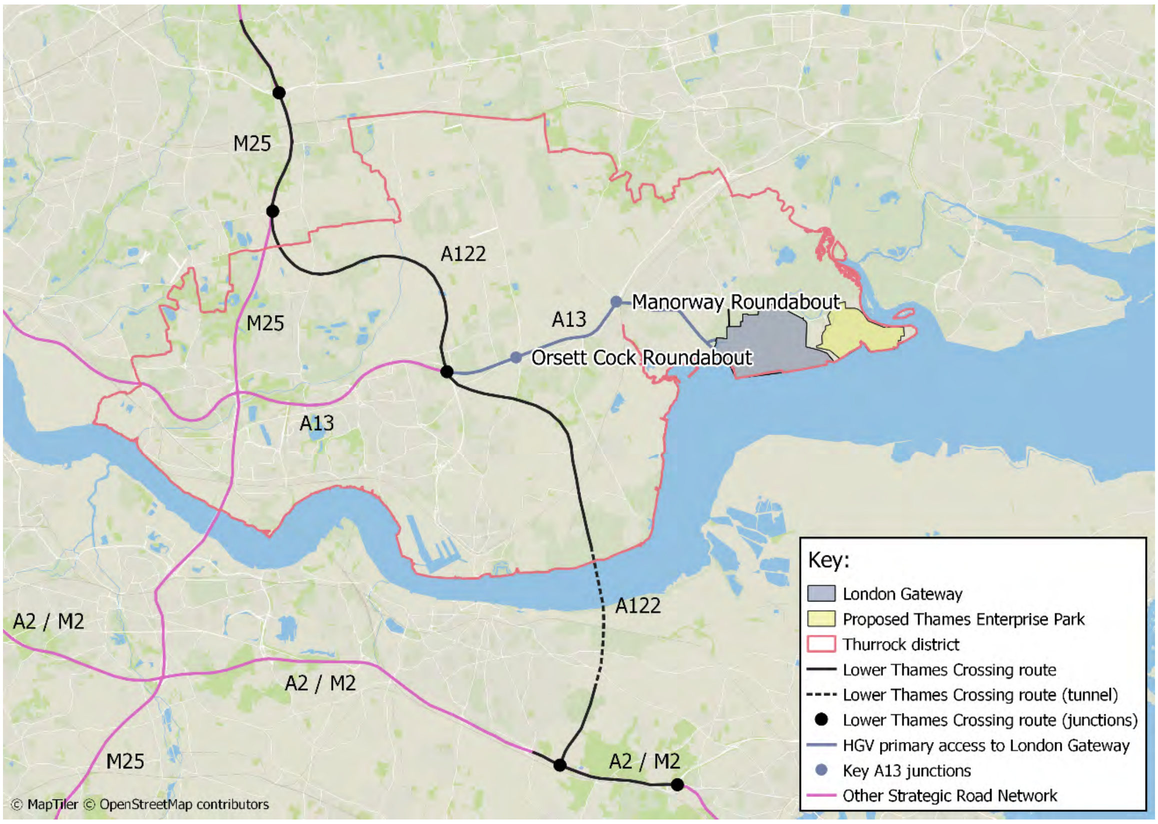
Appendices

1.0 Introduction and Context

1.1 London Gateway Port Limited, LG Park Freehold Limited and LG Park Leasehold Limited (collectively hereinafter referred to as DPWLG) are the owners and operators of DP World London Gateway Port (the Port) and DP World London Gateway Logistics Park (the Logistics Park) on the north bank of the Thames Estuary in Stanford-le-Hope, Essex.

1.2 The Port is a Nationally Significant Infrastructure Project (NSIP) and as described in the report by Volterra, makes a significant contribution to the national economy. Once fully developed, the Port will comprise deep sea shipping and container handling facilities with an annual throughput that will equate to approximately 27% of the predicted national growth in such trade by 2030. The Logistics Park will provide up to approximately 830,000sqm of vital commercial floorspace. Both are of national significance and importance.

1.3 The location of The Port and Logistics Park in the context of the LTC is shown below:



1.4 This report has been prepared by me, Simon Tucker of DTA, on behalf of DPWLG in relation to traffic and transport issues arising from the proposed LTC. I am a Director of DTA Transportation Ltd, Transportation Planning Consultants. The consultancy specialises in expert advice on transport related issues on a broad range of projects for both the public and private sector.

1.5 I am a Member of the Chartered Institute of Highways and Transportation, a graduate member of the Institution of Civil Engineers and hold an Honours Degree in Civil Engineering from the University of Manchester and have 23 years' experience in the field of Transport Planning. He has prepared transport and traffic reviews, Transport Assessments and contributed to the process of Environmental Impact Assessment for a wide range of projects. He regularly appears as an expert witness at Section 78 and Local Plan Inquiries, DCO and TWOA hearings.

1.6 By way of context, DTA have been involved in significant discussions with the LTC team throughout the progression of the draft DCO on behalf of DPWLG and attended most of the meetings that are recorded in the Statement of Common Ground: TR010032/APP/5.4.2.1.

1.7 I have been involved in advising DPWLG on the transport planning aspects of their operations at London Gateway since 2007 (i.e. shortly before the HEO (Statutory Instrument 2008 No. 1261 – relating to the Port) and original outline planning consent (Ref: 02/00084/OUT relating to the Park) was granted). I have since prepared various public and private reviews of port operations including the overseeing of the Transport Assessment for the London Gateway Logistics Park Local Development Order 2013 on the site.

1.8 I also act at a number of other port facilities around the Country, including Southampton (both the overall port and the container terminal), Immingham and Newport (Wales).

1.9 This review considers the failings of the current assessment provided as part of the LTC submission in terms of impact of the scheme on the operation of the Port and Logistics Park.

1.10 Specifically, this report expands on the concerns raised in the Relevant Representations as follows:

i) Limited and wholly insufficient information has been submitted to show that the impact at the A13/A128 Orsett Cock junction and the A13/A1014 Manorway junction (the Junctions) have been adequately assessed. Both are located along a critical route to the Port and Logistics Park and indeed the A13/A1014 provides the only HGV access route to the port from the SRN.

ii) The application, therefore, fails to adequately assess congestion and capacity issues at these Junctions or consider whether and to what extent these impacts need to be mitigated. This is a specific requirement of the NPS for National Networks Paragraph 5.216 – 5.217.

iii) Congestion on the local highway network, due to the proposed LTC development, will create significant adverse impacts at the Junctions which in turn would cause delay to vehicles accessing the Port and Logistics Park. The application does not adequately consider the potential economic impact on the Port and Logistics Park, and their essential contribution to the regional and national economy.

1.11 As set out in the PADS Tracker there are various areas of additional work required to allow the impacts of the Proposed LTC to be adequately considered. In summary, the approach taken by the Applicant fails to properly assess the impacts of the LTC on the Port and Logistics Park and in particular:

i) The use of the Lower Thames Area Model (LTAM) is insufficiently detailed to suitably assess the impact of the LTC on the key highway links to the A13 at Orsett Cock and The Manorway junctions which play a critical role in the highway accessibility of the Port and Logistics Park. It does, however, clearly show a significant increase in traffic flows and congestion on the A13 generally in the vicinity of the Port and Logistics Park.

ii) More detailed modelling of these junctions was provided to Thurrock Council (TC) by the LTC team and these were provided to DPWLG by TC on 19th June

2023. They are referred to below HE540039-LTC-TTM-GEN-REP-DCO-00001 (August 2022 – 'The NH Orsett Cock Modelling Report') and NH Document Ref: HE540039-LTC-TTM-GEN-REP-DCO-00002, dated September 2022 'The NH Manorway Modelling Report' – Collectively 'The NH Local Junction modelling'. The NH modelling identifies significant additional congestion at the A13/A128 (Orsett Cock) roundabout junction as a direct result of LTC.

iii) My own assessment confirms that such congestion will cause traffic to re-route via the A13/A1014 (Manorway Interchange) roundabout junction. This is because the NH modelling of Orsett Cock demonstrates long queues on the westbound approach (from LTC) and the Southbound Approach (the A127).

iv) In response to this, The NH modelling shows a large degree of 'latent demand' (vehicles which cannot physically get onto or through the Orsett Cock junction). The implication of this is that these vehicles will need to choose another route to get to the A13 (or LTC) and that is likely to mean they will divert to Manorway in two ways, either as a u-turn from the A13 or using the B1007 in preference to the A128 from the north.

v) The NH modelling has not been submitted as part of the application documentation, and it clearly and demonstrably conflicts with the suggested output of the LTAM model. The panel have requested clarification on the status of this modelling work. Further representations will be necessary in due course once further information is provided by the Applicant in the form of detailed modelling.

vi) It is clear that the effect of additional traffic utilising The Manorway Junction will have material adverse impacts on the operation of that junction, resulting in significant detrimental impacts in terms of journey time and congestion on the accessibility of the Port and Logistics Park (noting this junction is the Port and Logistics Parks sole point of access for freight movements), particularly given the sensitivity of the junction to the type of additional traffic movements likely to occur (as discussed further in Section 2.3 herein).

vii) Further, the DCO submission does not consider the effects of the proposals in circumstances where the Dartford Crossing (QE2 Bridge) is suffering significant congestion or is closed to traffic (for example as a result of high winds). This is a frequent event (see Plate 4.8 of Report 7.1 – Need for the Project). These events resulted in an impact on traffic flows for an average of 1.5 hours per day in 2019.

viii) One of the purported benefits of the scheme is to provide an alternative route in such scenarios and therefore the level of traffic re-routing to the above key junctions would be likely to be significant. This has not been assessed in the application.

ix) The DCO submission therefore fails suitably to assess the impact of the proposed scheme on the Orsett Cock and subsequently the Manorway junctions and, in doing so, fails to take full account of the potential impacts of the proposed LTC on the operational efficiency and resilience of the Port and the Logistics Park.

x) To rectify the failure, more modelling is required by the applicant. In the context of impacts of Orsett Cock, this will require:

Either:

A re-run the LTAM model using the known capacity constraints at Orsett Cock so that the model properly reflects the known throughput of the junction. This would allow the displacement effect of that capacity constraint to be re-assigned to other routes. The individual junctions should be then re-assessed using the individual junctions using local modelling tools to consider the impacts and potential mitigation. It may then be necessary to undertake a further run of the LTAM to consider the wider impacts of the mitigation proposed.

Or

The design of mitigation to address the issues raised in the NH Local Junction Modelling. The designed mitigation scheme should then be considered using the NH Local Junction modelling to confirm that the traffic flows currently assumed by the LTAM are appropriate and reasonable.

xi) Until this information is made available and the real impact on port cannot be known with any reasonable degree of certainty. It is therefore clear that the currently proposed mitigation in the form of ongoing monitoring of this critical route are insufficient to provide (or ensure delivery of) suitable mitigation in a timely manner or at all.

1.12 These points are inter-related but considered in turn below.

2.0 Implications of Local Junction Assessments

2.1 Context

2.1.1 As discussed above, at present no operational assessments of local junctions that affect the operation of the Port and Logistics Park have been submitted with the DCO.

2.2 Orsett Cock

Context

2.2.1 Orsett Cock will experience a significant change in traffic flows as a result of LTC. This is, in part, due to general induced growth generated on the A13 by the LTC, but also because of the lack of a direct highway link from the LTC (north or southbound) to the A1089 (Tilbury Dock Approach Road). All traffic wishing to access the A1089 from LTC has to U-turn at Orsett Cock (see table 7.3 of TRO10032-001481-7.9 – extract below).

2.2.2 The impact of this is shown graphically on the plans at **Appendix A**. The impact of this arrangement in simple terms is that all traffic routing to Tilbury from the LTC will be required to use Orsett Cock to U-turn.

2.2.3 The Orsett Cock junction has recently been upgraded as part of other wider A13 improvements. The scheme was (recently) designed to accommodate forecast movements relating to known developments and other growth through and around the junction. That assessment did not include any implications of LTC and the junction was not designed to accommodate a significant level of U-turning traffic as will be induced by LTC.

2.2.4 The implications of this are not assessed in the application.

Permitted movements

7.3.22 The A13/A1089/A122 Lower Thames Crossing junction has been designed to accommodate movements between the A13, A1089, A1013 Stanford Road and the Orsett Cock junction as detailed in Table 7.3.

Table 7.3 Permitted movements at the A13/A1089/A122 Lower Thames Crossing junction

Starting location \ Direct connections	LTC northbound	LTC southbound	A1089 southbound	A13 eastbound	A13 westbound
LTC northbound			✓†	✓	✗
LTC southbound			✓†	✓	✗
A1089 northbound	✓	✓		✓	✓
A13 eastbound	✗	✗	✓		
A13 westbound	✓*	✓*	✓†		

* Not from the Orsett Cock junction
† Via the Orsett Cock junction

Traffic Modelling by the Applicant

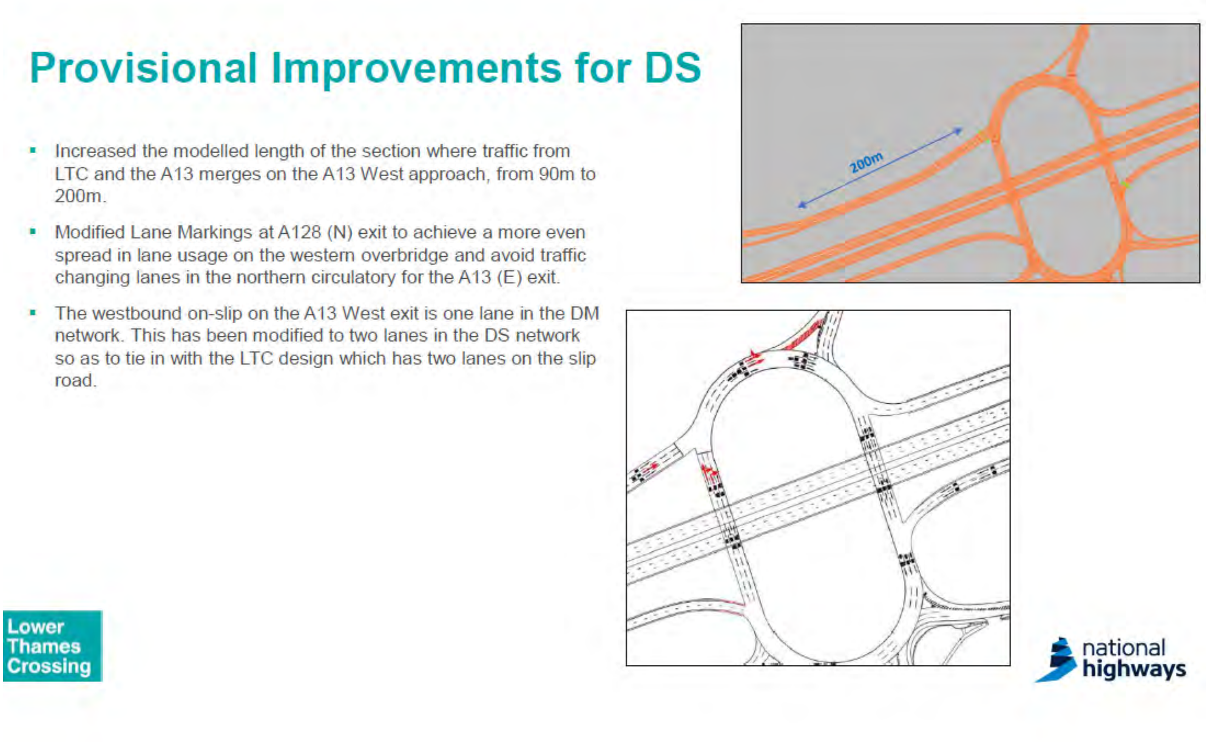
2.2.5 Although not within the formal DCO submission, the Applicant has, in fact, undertaken detailed traffic modelling of this junction as identified above.

2.2.6 This is reported in NH Document Ref: HE540039-LTC-TTM-GEN-REP-DCO-00001 (August 2022 – 'The NH Orsett Cock Modelling Report'), which was supplemented by a presentation made to Thurrock (dated 15th September 2022). They are attached at **Appendix B**. The results are discussed below.

2.2.7 It is clear from this modelling that the key change in flows at the junction as a specific result of the LTC is the U-turn movement from the A13 eastbound approach to the A13 westbound.

2.2.8 This equates to some **1,000** vehicles in each of the morning peak hours and **1,300** in the PM peak hours which is a very significant and material change.

2.2.9 The implication of this in terms of delay is that substantial queues form on both the A13 Eastbound approach and other arms of the junction (because they are giving way to a heavy additional turning movement). Although not in the DCO submission the Applicant's Orsett Cock Modelling Report proposes minor improvements on the junction (within highway boundary) to address this as follows:



2.2.10 Even with these localised improvements, significant delays and additional queuing is forecast in the Applicant's Orsett Cock Modelling Report on the approach arms, principally the A13 eastbound approach and the A128 from the north and A128 from the south.

2.2.11 The extent of the queuing is such that VISSIM modelling forecasts significant latent demand (i.e. the model does not consider that all the demand flows (as derived from the LTAM model) can get through the junction:

Latent Demand (no. vehicles)

- No. of vehicles unable to enter the model network during the simulation period due to queues blocking back to the edge of the network

	AM 7-8	AM 8-9	PM 17-18
Base	31	2	59
2030 DM	68	208	2
2030 DS	376	523	669
2045 DM	336	801	48
2045 DS	896	1529	1527

2.2.12 In reality, this means that LTAM is forecasting a higher traffic throughput at the junction than is possible in reality. This in turn means that the wider LTAM modelling (and conclusions drawn from it in terms of journey times and benefits) is under-reporting delay at the junction and over-reporting general traffic throughput.

2.2.13 The only output from the LTAM available to compare the findings of the two models is at Plates 7.27 – 7.2.9 of the applicants Transport Assessment. This suggests no significant impact at Orsett Cock, with a minor adverse impact in the AM Peak (2030) and a moderate adverse impact in the PM Peak. The NH Applicant's Orsett Cock Modelling Report clearly shows a major adverse impact.

2.2.14 On that basis the outcomes of the LTAM and local junction modelling assessments conflict with and contradict each other. Given the findings of the local junction model, my view is that the LTAM (as a strategic model) is most likely in error but that needs proper and thorough review.

2.2.15 The implication of the modelling is that queuing is likely on all arms of the junction. As might be expected, the Applicant's Orsett Cock Modelling Report suggests that A13 through traffic (which is the predominant demand from DPWLG) is not particularly affected by this impact. Journey times for A13E below as extracted Tables 4.4, 4.5 and 4.6 of the NH Orsett Cock Modelling Report (2030 DS minus DM Core Scenario).

2.2.16 However, the U-turn movement is significantly affected as shown below.

Table 1 – Change in delay at Orsett Cock as result of LTC (2030)

	0700-0800	0800-0900	1700-1800
A13 Westbound through junction	+4 sec	+3 sec	+4 sec
A13 Eastbound through junction	+2 sec	+ 4 sec	**+25 sec**
A13 Eastbound–A13 Westbound	+11 sec	+23 sec	**+111 secs**

2.2.17 It can be seen that the impact is significant and in particular the PM peak delays on the approach to the Orsett Cock from A13 Eastbound / LTC are in the order of 2 minutes. These should be treated with some caution given the fact that there are unreleased vehicles in the model and TC have concerns over the way the model has been created and it is important to note, therefore, that delays are likely to be significantly higher.

Traffic Modelling by DTA

2.2.18 The conclusions reached in the Applicants Orsett Cock Modelling Report have been supplemented by my own assessment of the junction operation using LINSIG.

2.2.19 Separately, data has also been obtained by DPWLG for the junction in the form of a junction traffic count in November 2022. This is attached at **Appendix C**.

2.2.20 To provide my own assessment of the Orsett Cock junction, the approach flows for each arm have been applied to the surveyed turning movements (and PCU ratios (Passenger Car Units) from the DPW turning count (Appendix C) and factored accordingly.

2.2.21 The results of the modelling are provided in **Appendix D**, and corroborate the broad conclusions of assessment provided to Thurrock by the Applicant.

2.2.22 In the 2030 scenarios without LTC, the junction is operating at or around capacity. With the introduction of LTC and, in particular, the increased U-turning movement, overall capacity of the junction is significantly exceeded. Delays on key routes through the junction increase from around 30 seconds (which is typical for a large partially signalised roundabout) to in excess of 10 minutes as shown on **Table 2** below.

Table 2 – Journey Times through Orsett Cock – 2030 (in Seconds)

	0700-0800	0800-0900	1700-1800
DM			
A128 Southbound to A13 / A1013	65	67	58
A13 / A1013 to A128 Northbound	43	42	36
A13 U-Turn	0	98	75
DS			
A128 Southbound to A13 / A1013	415	464	358
A13 / A1013 to A128 Northbound	348	365	477
A13 U-Turn	755	808	738
Difference			
A128 Southbound to A13 / A1013	350	397	300
A13 / A1013 to A128 Northbound	305	323	441
A13 U-Turn	755	710	664

Wider Implications in absence of Mitigation

2.2.23 As set out above, in the absence of mitigation the LTC will result in significant delays at the Orsett Cock junction. The degree to which that will manifest is different between the detailed junction modelling approaches taken by me and the applicant, but both confirm the junction will be well over capacity. This will mean that all of the traffic flows forecast by the strategic modelling (LATM) will not be able to get through the junction and will be diverted elsewhere.

2.2.24 This effect is heightened by the fact that SatNav systems re-route traffic in real time. There are two principal likely outcomes in this respect.

i) Those travelling from the A127 to the A13 will chose to avoid this congestion and use Manorway Interchange and

ii) Those travelling from the LTC to Tilbury will see the existence of a lengthy queue on the approach to Orsett Cock (the junction itself will not be visible from the tail of the queue) and chose then to avoid the queue and instead U-turn at Manorway Interchange.

2.2.25 The effects of these changes need proper and detailed assessment by the applicant. At present the outcomes of the LTAM and local junction modelling assessments conflict with and contradict each other. Given the findings of the local junction model my view is that the LTAM (as a strategic model) is most likely in error and is in layman's terms assuming too much traffic can use the junction that would be practicable in real life. It therefore underestimates the impact of that traffic routing elsewhere.

2.2.26 To fully assess the situation an iterative approach is necessary. The applicant needs to:

1) Re-run the LTAM model using the known capacity constraints at Orsett Cock so that the model properly reflects the known throughput of the junction. This should allow the displacement effect of that capacity constraint to be re-assigned to other routes; and then,

2) reassess the individual junctions using local modelling tools to consider the impacts and potential mitigation.

3) It may then be necessary to undertake a further run of the LTAM to consider the wider impacts of the mitigation proposed.

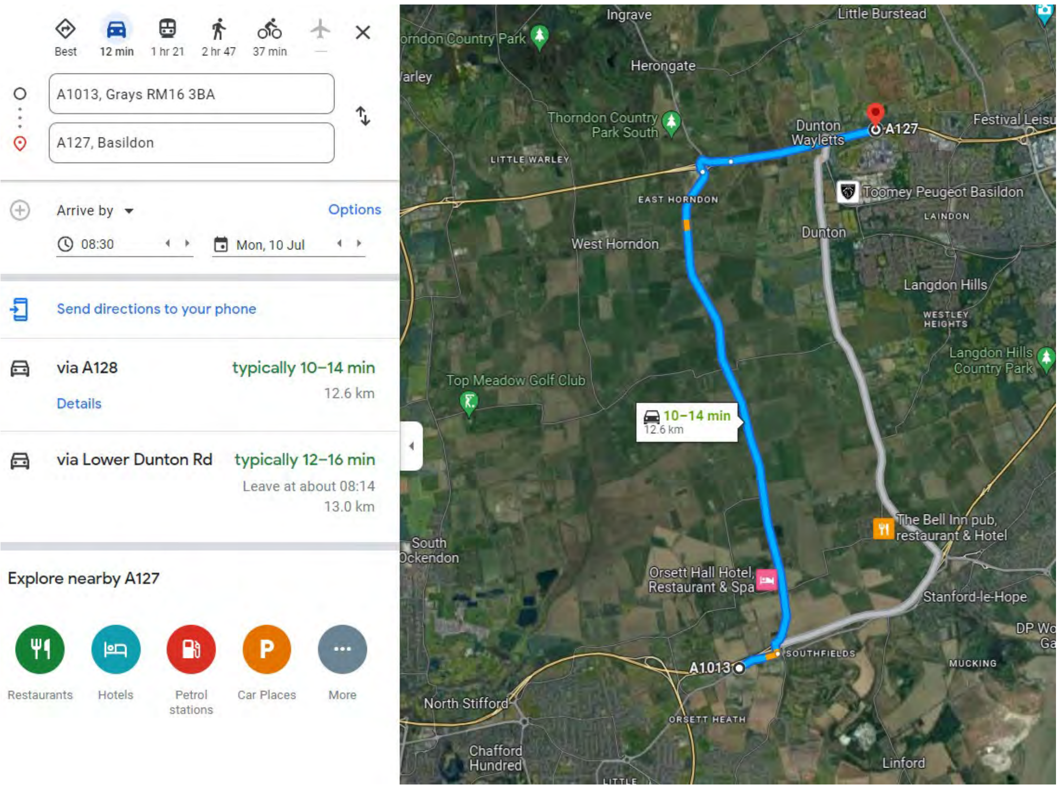
2.2.27 In the absence of this detailed appraisal I set out below the potential implications of the capacity constraints at Orsett Cock.

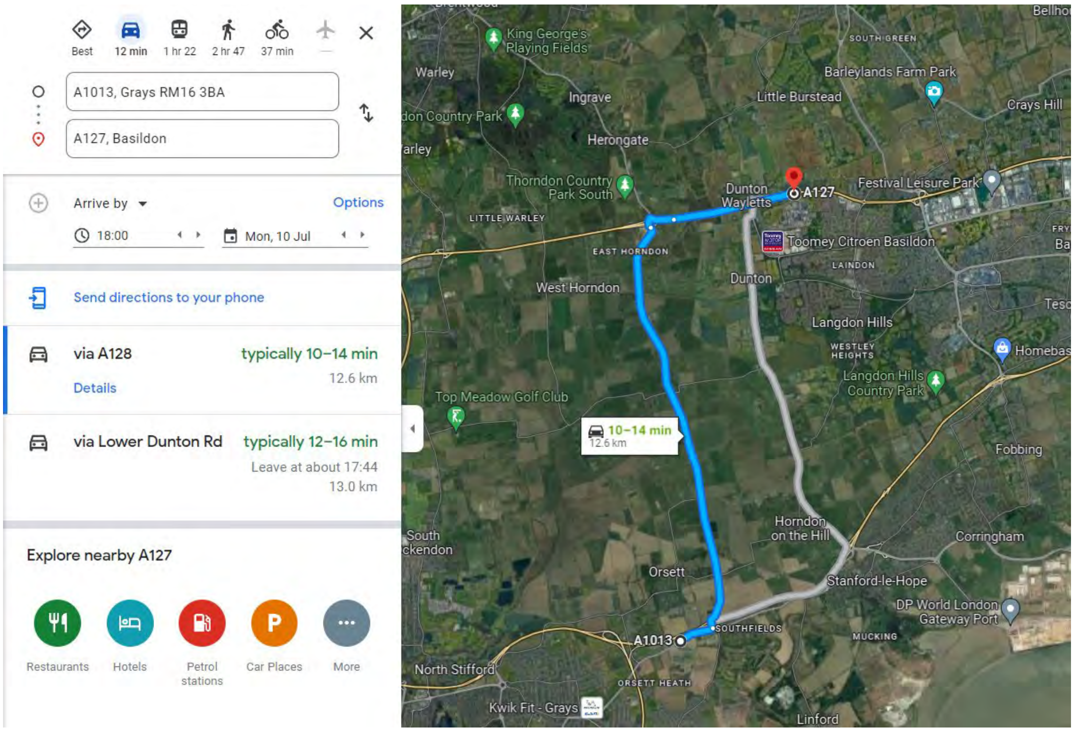
2.2.28 Firstly, the movement from the north, southbound on the A128 will experience long queues which will mean traffic traveling from the north (the A127) will be subject to severe delays. The NH modelling shows that there will be additional delay of 148 seconds in the PM Peak (2030) – reference Page APP46 of Appendix B. That should be treated as very conservative because the modelling also has a large level of latent demand (up to 670 vehicles per hour).

2.2.29 My assessment (Table 2 above) shows the increase could be between 300 and 400 seconds. The Linsig assessment has no latent demand and therefore is considered more appropriate.

2.2.30 As shown below there are two main route choices for traffic travelling from the A127 to the A13 Corridor. One is via Orsett Cock and the other via Lower Dunton Road and the Manorway Interchange. Under present conditions (both time periods) the route via Orsett Cock is presently 2 minutes faster than via Dunton Lane.

2.2.31 Clearly if journey times via Orsett Cock will increase by up to 400 seconds (i.e. over 6 ½ minutes), then most Sat Nav systems set for the fastest route would route the car via Lower Dunton Lane and hence Manorway Interchange until this too becomes too congested to offer any advantage in journey time saving.



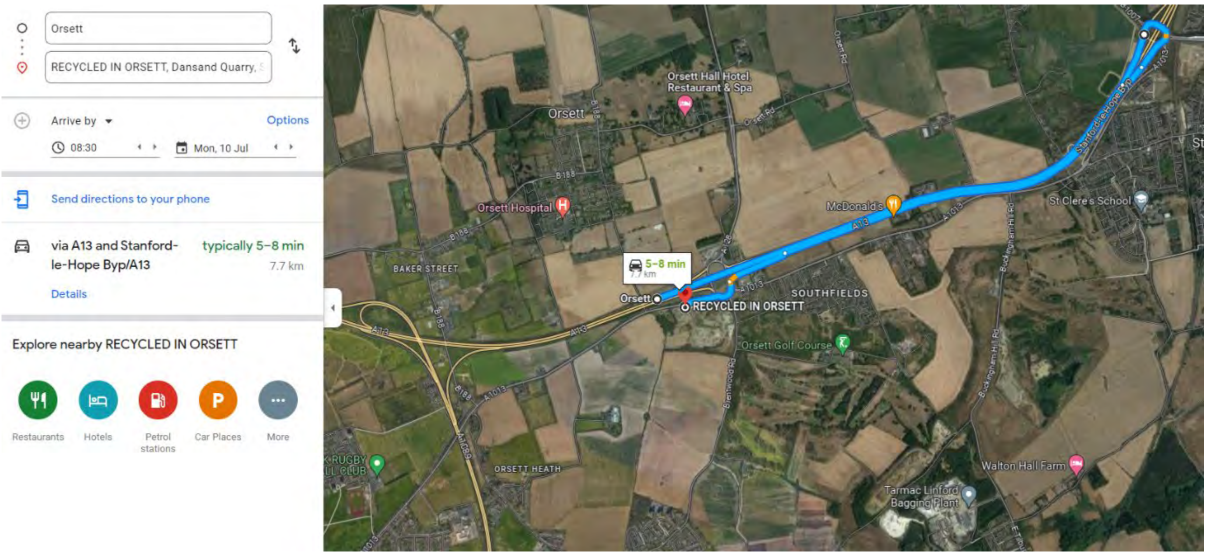


2.2.32 The modelling shows between 700 and 800 vehicles per hour approaching the Orsett Cock Roundabout from the north. On the basis of the NH modelling there are up to 600 vehicles which cannot even get through the junction on that movement in the PM Peak.

2.2.33 Clearly not all these will divert to Manorway (which itself will become congested) and in practise there will be some rebalancing of flows across the network. For that reason, as discussed above, a re-run of the LTAM model will ultimately be required but for present purposes as a proxy to test the sensitivity of changes of flows in this regard, 100 vehicles have been added to Manorway Interchange in each hour.

2.2.34 In the context of the U-turn and with reference to Table 2 above, this could experience delays of up to 10 minutes. The journey from Orsett Cock to Manorway and back is around 6.6km. From a point just to the west of Orsett Cock to the A1013 has a typical journey time of between 5 and 8 minutes even with existing congestion on the A13 - see below. On that basis there is the likelihood (given a journey time saving of up to 5 minutes) that drivers (and most Sat Nav systems) would re-route via The Manorway Interchange.

2.2.35 As described above, U-turning traffic at Orsett Cock is forecast by the applicant to be 1,000 vehicles in the AM peak and 1,300 in the Pm Peak. A proportion of this will inevitably divert to The Manorway. As a proxy only at this stage, and in advance of further detailed modelling (as described in 2.2.26 above), the implications of 100 additional vehicles (around 15% of released demand) has been tested diverting to Manorway Interchange to under the u-turn as a result of significant congestion at Orsett Cock which is discussed further below.

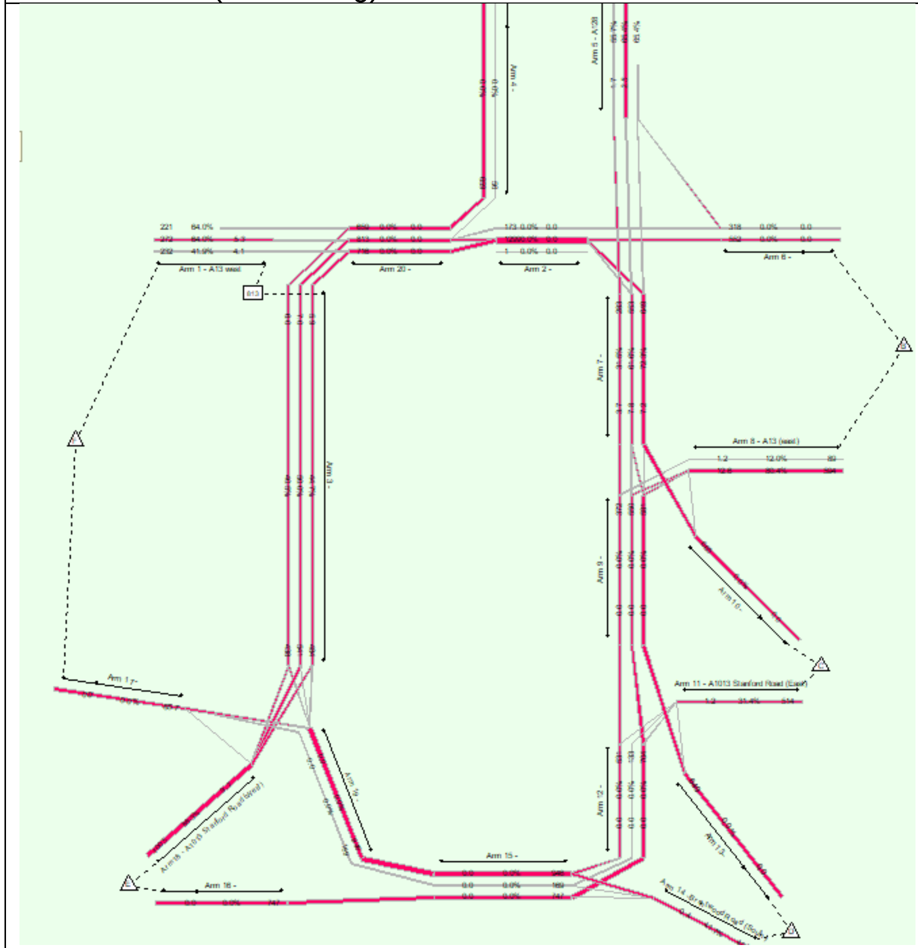
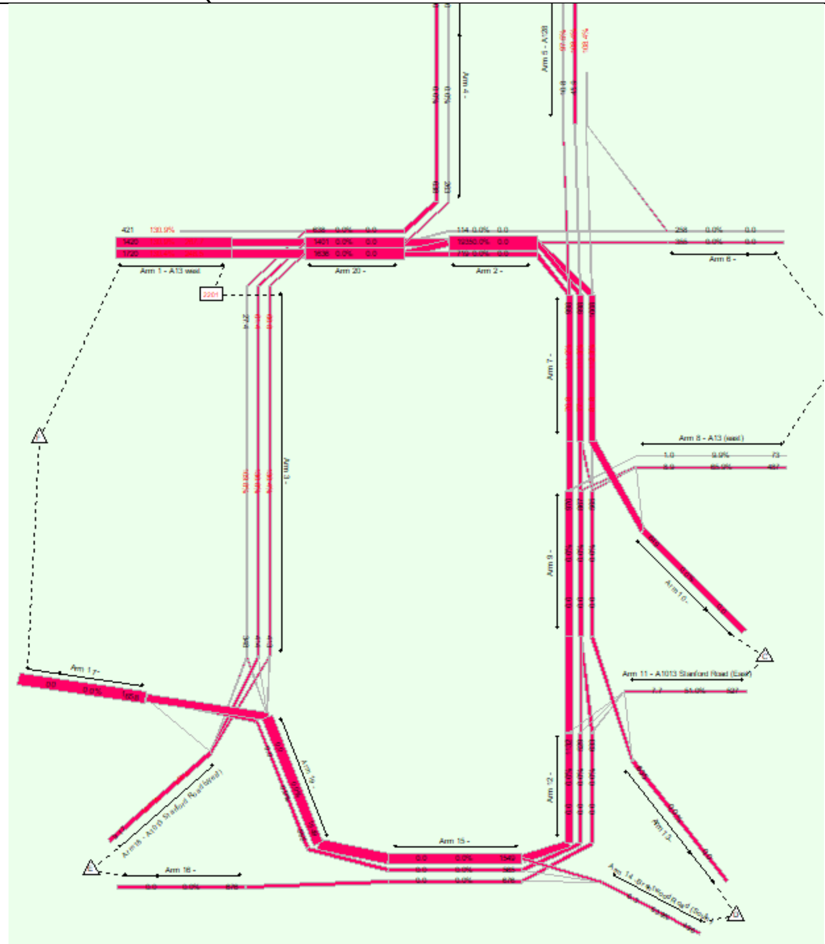


Potential Mitigation

2.2.36 It is clear that the Orsett Cock junction is not suitably configured to accommodate significant U-turning traffic.

2.2.37 The junction has three lanes on the circulatory and currently one (the inside lane) of those affectively accommodates the U-turn movement. On the southern side of the junction the markings are poor and do not easily provide for the traffic in the inside lane, over the bridge crossing three lanes of traffic to exit.

2.2.38 The results of the LINSIG modelling show that in the PM Peak hours there is a lack of capacity on the eastbound approach and this includes both the approach and the northbound overbridge signals.

2030 PM Peak (Do Nothing)	2030 PM Peak (With LTC
	

2.2.39 As can be seen from the above, the change in flows are significant and represent the need for an additional lane on the U-turn movement to accommodate flows. This in turn will likely need an additional lane on the eastbound off-slip, the A1089 approach, the southbound overbridge and then signalisation of the southern arms of the junctions. To accommodate signalisation of these arms it is likely that third party land will be required.

2.2.40 Clearly a significant amount of extra work (in terms of both modelling and design) will be required by the applicant to resolve this but a concept of the possible scale of works that might be appropriate is shown at **Appendix E**. Clearly the arrangement is schematic but is provided to assist in illustrating the scale of works (and additional lanes) that are required to accommodate demand and overcome this issue. This is one option of a range of possible solutions that will need to be refined by the applicant as part of the design process.

2.2.41 Once the preferred solution has been reached and demonstrated to work in localised modelling package, it would be appropriate to re-run the wider LTAM model to ensure that the currently highlighted discrepancies between the outputs can be resolved. This iterative process will affect the stated wider journey times and purported benefits and is thus required prior to a decision on the application in more general terms.

2.2.42 Works to Orsett Cock Roundabout could potentially be avoided through the creation of a direct link to the Tilbury Area from the LTC. This would avoid the need for vehicles to route through Orsett Cock. Although this appears to have been discounted at an early stage by the Applicant (on the grounds of cost), this decision was made some time in advance of the completion of the traffic modelling and should have been reconsidered.

2.3 Manorway Interchange and the Sorrells

Context

2.3.1 The access to the Port and Logistics Park is via Sorrells Roundabout, which in turn connects via Manorway to the A13 at Manorway Interchange. This is the only access to the Port and Logistics Park for HGV traffic and is the main access route for staff (other than those living locally in Stanford le Hope and Corringham).

2.3.2 Works were undertaken to both this junction and the Orsett Cock junction (the latter being as part of the A13 widening scheme) as part of the original consents for the Port and Logistics Park. These included the widening and signalisation of both junctions. The junction improvements were specifically designed to accommodate increased demand to the site from the A13 Eastbound inbound and to the A13 Westbound as an outbound movement. The layout of The Manorway Interchange in particular prioritises these movements.

2.3.3 The junctions were designed to accommodate peak movements for the Port and Logistics Park which include the more typical morning and evening peak periods (0800-0900 and 1700-1800) and shift change peak early afternoon.

2.3.4 The Manorway Interchange has not been designed to accommodate significant levels of traffic travelling from the A127 to A13 westbound and, in particular, there is very little stacking space on the gyratory to accommodate this and allow priority to the Port and Logistics Park traffic travelling outbound. At this location the distance between the stop line and the main route from the roundabout to The Manorway is only 25m. This means that only 5 cars (and less than 2 HGVs) are able to wait at a red light before they block the exit to Manorway from the roundabout.

2.3.5 The layout is insufficient to accommodate U-turners.

Traffic Modelling by the Applicant

2.3.6 As with Orsett Cock, no operational assessment of this junction has been submitted with the DCO. Operational assessments carried out by the Applicant have, however, been provided to Thurrock. This is reported in NH Document Ref: HE540039-LTC-TTM-GEN-REP-DCO-00002, dated September 2022 'The NH Manorway Modelling Report' (**Appendix F**). This covers a network which includes both The Manorway Interchange and Sorrells as shown below.

2.3.7 TC have confirmed to me that they have made representations to the Applicant about the adequacy of this modelling and that further work and refinement will be necessary before final models can be agreed. The current conclusions of the modelling as discussed below are, however, clear and it is understood that TC are of the view that any refinements to the Applicant's Manorway Modelling Report will show a worsening of impacts from that currently presented. TC consider at present there is a lack of appropriate assessment data to allow any conclusions to be reached.

2.3.8 Notwithstanding that position, I have considered the impacts in light of the information that is available. Clearly more work is required by the Applicant to resolve these concerns and to provide a more substantial and appropriate evidence base to inform decision-making.

Plate 2-1 Traffic Operations Study Area

2.3.9 The Applicant's Manorway Modelling Report provides turning movement forecasts for 2030 with and without the LTC. The headline result of the flows are that the Manorway Interchange will experience significant changes in flows as a result of LTC which has not been assessed in any detail in the submission.

2.3.10 Changes at Sorrells are not significant and no further assessment is undertaken at this stage.

2.3.11 The Applicant's Manorway Modelling Report (at Table 4-3) provides details for traffic flows around the junction within and without the LTC for the future year of 2030. These have been transposed and are summarised below:

Table 3 – Change in Overall Vehicle Flows at Manorway Junction as result of LTC

0800-0900 (2030)						
	A	B	C	D	E	Total
A	0	-4	15	0	-5	6
B	-53	0	-1	283	-6	223
C	-56	3	0	83	-7	23
D	0	165	0	0	7	172
E	-1	-115	-9	125	0	0
Total	-110	49	5	491	-11	424
1700-1800 (2030)						
	A	B	C	D	E	Total
A	0	-59	15	0	-1	-45
B	-335	0	-5	422	-77	5
C	-129	15	0	120	33	39
D	0	185	0	0	-44	141
E	-7	-32	15	28	0	4
Total	-471	109	25	570	-89	144

A	A13 East /North (Westbound off slip, Eastbound On-slip
B	Manorway
C	A1013
D	A13 S / W (eastbound off-slip, westbound on-slip)
E	B1007

2.3.12 It can be seen from the above that in the morning peak overall flows will increase by 424 vehicles (or around +10% of total movements). Of specific concern is the fact that flows to Arm D will increase significantly, and it is these movements which have to compete with outbound movements from Arm B, which includes DPWLG traffic flows at the signals. Of these around 125 are an increased right turn from the B1007.

2.3.13 The implication of this in modelling terms is discussed below but this node is the key constraint to capacity at the junction and therefore any changes to this will be particularly sensitive.

2.3.14 This is of heightened concern given the conclusions in respect of Orsett Cock, as set out above, because no additional U-turning is forecast by the Applicant at the Manorway junction as a result of LTC. For the reasons set out below, this is considered to be wholly unrealistic.

2.3.15 The outcomes of the Applicant's Manorway Modelling Report are generally however encouraging. The change in delay for both 2030 and 2045 are generally unremarkable:

Table 4-2 Journey times DM v DS – PM Peak

	Journey Times [s]					
	Do-Minimum		Do-Something		Difference (DS-DM)	
Route	2030 PM	2045 PM	2030 PM	2045 PM	2030 PM	2045 PM
1. A13 South to A13 North	105	105	106	110	2	5
2. A13 North to A13 South	104	109	116	140	13	31
3. A13 South to Port Access	240	242	238	246	-2	3
4. Port Access to A13 South	217	224	232	246	15	22
5. A13 North to Port Access	204	206	207	221	3	15
6. Port Access to A13 North	282	290	276	281	-6	-9
7. B1007 to Port Access	206	211	203	203	-4	-8
8. Port Access to B1007	210	213	216	220	6	7

2.3.16 This does however highlight an issue with the A13 reliability as discussed in more detail below. As part of its Manorway Modelling Report, the Applicant considered some sensitivity analyses. This was because the LTAM modelling was apparently showing an issue whereby the capacity of the slip roads (from Manorway to the A13 (in both directions) meant that a queue was forming along the on slips back to the Manorway Interchange junction.

2.3.17 The result of this is that LTAM is under-estimating demand at the junction by around 400 PCUs in the AM peak and 550 in the PM peak (Para 5.1.3 of **Appendix F**).

2.3.18 The traffic suppression in LTAM is caused by the delays observed on the A13 eastbound on-slip, which leads to traffic seeking alternative routes. Since VISSIM is not predicting similar delays on the slip road, it can be anticipated that more traffic would use the slip road to access the A13 eastbound.

2.3.19 This confirms the concern raised above about the efficacy of the LTAM approach generally. Table 5-2 as extracted from the NH Manorway Modelling Report highlights the sensitivity of changes in flows to delay at the junction. It can be seen that the operation of the junction and resultant impact on DPWLG access junction is highly sensitive to changes in flows at the junction and therefore this needs very careful consideration. As a strategic reassignment tool, the LTAM is simply incapable of assessing this at the appropriate level of detail.

Table 5-2 Journey times – 2045 PM

	Journey Times [s]								
	Core Scenarios		Sensitivity Test			Difference			
Route	DM 2045 PM	DS 2045 PM	DS 2045 PM +25%	DS 2045 PM +50%	DS 2045 PM +70%	DS 2045 PM	DS 2045 PM +25%	DS 2045 PM +50%	DS 2045 PM +70%
1. A13 South to A13 North	105	110	109	111	112	5	4	6	7
2. A13 North to A13 South	109	140	133	133	131	31	24	25	22
3. A13 South to Port Access	242	246	244	246	257	3	2	4	15
4. Port Access to A13 South	224	246	247	248	328	22	24	25	104
5. A13 North to Port Access	206	221	218	219	215	15	12	13	9
6. Port Access to A13 North	290	281	289	423	726	-9	-1	133	436
7. B1007 to Port Access	211	203	204	225	304	-8	-8	14	93
8. Port Access to B1007	213	220	221	223	332	7	8	10	119

2.3.20 The only output from the LTAM available to compare the findings of the two models is at Plates 7.27 – 7.2.9 of the applicants Transport Assessment (Document 7.9). This suggests major adverse impacts in the vicinity of Manorway Interchange in the PM Peak (before consideration of the reassignment of traffic caused by delays at Orsett Cock as discussed above).

2.3.21 On that basis the outcomes of the LTAM and local junction modelling assessments at Manorway also appear conflict with and contradict each other and this issue needs proper and thorough review.

Traffic Modelling by DTA

2.3.22 As with Orsett Cock, I have also considered the operation of Manorway using LINSIG. A similar approach to Orsett Cock has been adopted (i.e. traffic flows extracted from the VISSIM model and factored to PCUs using the HGV proportions observed in November 2022. The model used is a version of that and is understood to be agreed with TC (in respect of the Thames Enterprise Park scheme).

2.3.23 In the case of Manorway however I have considered a number of additional sensitivity tests with additional flows at the Junction caused by congestion at Orsett Cock as described at Paras 2.2.25 – 2.2.35 above.

2.3.24 The results of the modelling are presented in **Appendix G**.

2.3.25 The results show that the junction will be operating over capacity in the AM both with and without LTC (-40% without worsening to -60% with). In this scenario, the critical arm is the B1007 and therefore flows to and from DPWLG from the A13 are not materially impacted and could be resolved by mitigation in the form of signalisation or widening of the B1007 approach.

2.3.26 In the PM peak, the junction is operating just within capacity without LTC and this reduces to around -20% with LTC in place. The principal impact in the PM peak is at the Manorway Arm as it competes with demand from the circulatory carriageway. To avoid the circulatory carriageway blocking the junction, the modelling prioritises the circulatory over the A1014 approach. Vehicles exiting the Port will therefore be subject to additional delay as discussed below.

2.3.27 The junction is clearly sensitive to changes in flows at this location. As discussed in the context of Orsett Cock above only minor changes in wider distribution arising from congestion at Orsett Cock would result in material changes in junction operation as the additional demand loads onto those critically sensitive nodes of the junction.

2.3.28 The table below provides a sensitivity test to show the implications if flows from the B1007 to the A13 and the U-turn from the A13 increased by only 100 vehicles per hour each (as described above in 2.2.25 – 2.2.35), the journey times for vehicles to and from DPWLG would increase disproportionately as shown below. This includes a further sensitivity test for Dartford Crossing closures, which is discussed in more detail in Paragraph 3.2.7 below.

Table 4 – Junction Operation – Manorway

	A13 S to Manorway (DPWLG inbound)	Manorway to A13 S (DPWLG outbound)
AM DM	33s	18s
AM DS	47s	22s
AM DS Sensitivity(+100 vph on U-turn and B1007 – A13)	68s	25s
AM Dartford Incident Sensitivity (plus further 100 vph on U-turn and 100 on B1007 – A13)	191s	29s
PM DM	34s	26s
PM DS	46s	34s
PM DS Sensitivity	36s	67s
PM Dartford Incident Sensitivity	39s	122s

2.3.29 Clearly if refinements of the modelling by the applicant do confirm this diversionary affect is higher, then the impacts will be, disproportionately, worse.

Mitigation

2.3.30 In all cases the B1007 approach is over capacity because traffic from the A13 Eastbound to The Manorway has priority. For that reason, there is limited impact on inbound journey times to DPWLG. However, it would be reasonable to expect Thurrock Council would require the B1007 congestion (which is significant) to be addressed. This could mean the A13 Eastbound to Manorway traffic losing some of its priority (and hence see an increase in journey times, so again the impact on the

DPWLG operation is likely to be worse than highlighted above. If congestion on B1007 needs to be addressed it is not clear how that conflict itself might be best overcome.

2.3.31 It is however clear that to deal with that issue, mitigation will be required. Accommodating this level of traffic may require significant changes to the junction. Clearly a significant amount of extra assessment work (in terms of both modelling and design) will be required by the Applicant to resolve this, but a concept of the possible scale of works that could provide appropriate mitigation to address the issue is shown at **Appendix H**.

2.3.32 The level of traffic forecast on the A13 and using the slip roads as set out above are likely to further require changes to the slip road geometry to accommodate design flows. This has not been assessed by the Applicant.

3.0 Other Network Impact Issues

3.1 Journey Time Reliability

3.1.1 The LTC will increase flows on the key routes out of London Gateway. Table 8.13 of TR010032-001348/APP/7.7 (Appendix C Transport Forecasting Package) shows the A13 between Orsett Cock and Manorway will increase by over 500 vehicles in the core scenario 2030, with V/Cc over 0.9 particularly in the PM peak.

Table 8.13 Key corridor traffic flows – 2030 core DM vs DS (hourly flows in PCUs)

Location	Location description	Time period	DM			DS			Flow differences	
			Flow	Effective capacity	V/C	Flow	Effective capacity	V/C	Diff.	Diff. %
A	M25 junction 29 to M25 junction 28 (NB)	AM	7,370	9,180	0.80	8,554	9,180	0.93	1,184	16%
		IP	6,525	9,180	0.71	7,243	9,180	0.79	718	11%
		PM	6,712	9,180	0.73	7,458	9,180	0.81	746	11%
	M25 junction 28 to M25 junction 29 (SB)	AM	7,552	9,115	0.83	7,725	9,180	0.84	173	2%
		IP	7,033	9,115	0.77	7,334	9,180	0.80	301	4%
		PM	7,441	9,115	0.82	7,986	9,180	0.87	545	7%
B	M25 junction 4 to M25 junction 3 (NB)	AM	5,358	6,850	0.78	5,530	6,850	0.81	172	3%
		IP	5,316	6,850	0.78	5,476	6,850	0.80	160	3%
		PM	5,944	6,850	0.87	6,147	6,850	0.90	203	3%
	M25 junction 3 to M25 junction 4 (SB)	AM	6,730	6,850	0.98	6,842	6,850	1.00	112	2%
		IP	4,955	6,850	0.72	5,035	6,850	0.73	79	2%
		PM	5,541	6,850	0.81	5,741	6,850	0.84	199	4%
C	A13 A126 to A1012 (EB)	AM	4,918	6,310	0.78	3,947	6,296	0.63	-971	-20%
		IP	4,941	6,297	0.78	4,194	6,284	0.67	-746	-15%
		PM	5,752	6,265	0.92	5,518	6,237	0.88	-234	-4%
	A13 A1012 to A126 (WB)	AM	6,122	6,360	0.96	5,363	6,360	0.84	-759	-12%
		IP	5,288	6,360	0.83	4,388	6,360	0.69	-900	-17%
		PM	5,695	6,360	0.90	4,661	6,360	0.73	-1,033	-18%
D	A13 Orsett Cock to Manor Way (EB)	AM	4,591	6,370	0.72	5,213	6,370	0.82	622	14%
		IP	3,987	6,370	0.63	4,637	6,370	0.73	649	16%
		PM	4,871	6,370	0.76	5,744	6,370	0.90	873	18%
	A13 Manor Way to Orsett Cock (WB)	AM	5,136	6,220	0.83	5,782	6,220	0.93	646	13%
		IP	4,100	6,220	0.66	4,786	6,220	0.77	686	17%
		PM	4,449	6,220	0.72	5,609	6,220	0.90	1,160	26%
E	A2 A227 to Gravesend East (EB)	AM	5,781	9,238	0.63	4,729	9,232	0.51	-1,053	-18%
		IP	5,982	9,193	0.65	4,847	9,183	0.53	-1,135	-19%
		PM	9,016	9,184	0.98	8,431	9,171	0.92	-585	-6%
	A2 Gravesend East to A227 (WB)	AM	6,890	7,227	0.95	6,288	7,008	0.90	-602	-9%
		IP	5,723	7,058	0.81	4,675	6,877	0.68	-1,047	-18%
		PM	5,840	6,879	0.85	5,322	6,733	0.79	-518	-9%

3.1.2 This is worsened by 2037 as below (Table 8.34)

		PM	5,910	6,360	0.93	4,847	6,360	0.76	-1,063	-18%
D	A13 Orsett Cock to Manor Way (EB)	AM	4,902	6,370	0.77	5,490	6,370	0.86	588	12%
		IP	4,217	6,370	0.66	4,941	6,370	0.78	724	17%
		PM	4,953	6,370	0.78	5,870	6,370	0.92	917	19%
	A13 Manor Way to Orsett Cock (WB)	AM	5,200	6,220	0.84	5,854	6,220	0.94	653	13%
		IP	4,359	6,220	0.70	5,061	6,220	0.81	702	16%
		PM	4,784	6,220	0.77	5,826	6,220	0.94	1,042	22%

3.1.3 If one adopts the high growth scenarios, the situation by 2030 and then 2045 is (obviously) higher (see Tables D.145 and D.170 of TR010032-001334/APP/7.7) Combined Modelling and Appraisal Report - Appendix C - Transport Forecasting Package Annexes.

3.1.4 Clearly with V/C over 0.85 journey times will become more unreliable. This is confirmed in the Combined Modelling and Appraisal Report (TRO10032-01350-7.7) which confirms at Para 7.7 that:

> *"The V/C ratio shows the number of vehicles forecast to use a road as a ratio of the number of vehicles that could use the road. As the V/C rises towards 1.0, then the road is approaching capacity; the speed at which the vehicles can travel will start to fall due to the sheer volume of traffic on the link and journey times will become more unreliable. For example, there will be more episodes of delay when a car in the flow of traffic brakes and there is a ripple effect back along the link. There are also less opportunities to overtake a slow-moving vehicle. A V/C ratio of above 0.85 indicates the likelihood of frequent occurrences of slow-moving traffic and above 0.95 indicates a network under pressure."*

3.2 Resilience Issues

3.2.1 As set out in the DPWLG's Relevant Representations, impacts during closures of Dartford Crossing must be considered.

3.2.2 This is a frequent event (see Plate 4.8 of Report 7.1 – Need for the Project). These events resulted in 10 lane closures per day with an average duration of 10 minutes. This results in an impact on traffic flows for an average of 1.5 hours per day in 2019.

3.2.3 In such circumstances the level of traffic re-routing via the A13/A128 and A13/A1014 junctions would be likely to be even more significant. At present this not assessed in the DCO submission.

3.2.4 TR010032/APP/7 (Document 7.9 Transport Assessment) confirms at Para 7.9 that the promotors consider the scheme will improve resilience on the network generally:

> "7*.9.4 Closure of the Dartford Crossing infrastructure can occur through a number of different causes. A particular feature of the Dartford Crossing is the restrictions on vehicle dimensions in the northbound tunnels, as well as restrictions on vehicles carrying hazardous loads. This leads to delays when vehicles do not follow the operational requirements. Hazardous load vehicles are currently required to be escorted through the northbound tunnels due to these restrictions. This requires normal traffic to be held approximately every 15 minutes for the escort to take place. This causes traffic to build up on the approach to the northbound crossings. On the southbound crossing, high winds lead to operational restrictions or closures of the QEII Bridge. The A122 Lower Thames Crossing would provide a more resilient crossing, as it has been designed as a category-A tunnel and would not be affected by these issues.*
>
> *7.9.5 Thames Crossing would provide a more resilient crossing, as it has been designed as a category-A tunnel and would not be affected by these issues.*
>
> *The crossing at Dartford is serviced by roundabout junctions in close proximity which impact on the traffic movements. By contrast, the A122 Lower Thames Crossing would be more resilient than the Dartford Crossing approach roads, as it has been designed as a free-flow network with no static junctions in close proximity to the tunnel, therefore providing greater unrestricted capacity and reducing the risk of delays on the route.*
>
> *7.9.6 Currently at the Dartford Crossing when incidents do occur, the fact that it is often operating at, or above, capacity means that it has little resilience and users experience further flow breakdown, resulting in greater delays and even*

poorer levels of service. The Project would reduce traffic flows at the Dartford Crossing by 19% on average in the opening year. As a result, journey times across the Dartford Crossing would become more reliable. Due to the lower volumes of traffic, the Dartford Crossing and approach roads would recover more rapidly from minor incidents on the crossing."

3.2.5 Whilst it may be true that the Dartford Crossing may become more resilient, no assessment has been carried out on the impacts on flows on the new LTC (and the routes directly serving them including the A13) when the crossing is fully or partially closed for any of reasons stated.

3.2.6 Table 7.4 of the TA shows the overall level flows on crossing as follows:

Table 7.4 Hourly forecast cross-river flows (PCUs/hr)

Period	Year	Without the Project (Do Minimum)	With the Project (Do Something)		
		Dartford Crossing*	Dartford Crossing*	Lower Thames Crossing	Total flows
AM peak hour	2016	14,430	-		
	2030	16,020	13,280	8,040	21,320
	2045	16,260	14,870	8,940	23,810
Inter-peak hour	2016	11,790	-		
	2030	14,410	10,780	6,510	17,290
	2045	15,660	12,770	7,590	20,360
PM peak hour	2016	12,830	-		
	2030	15,310	12,020	7,990	20,010
	2045	16,280	13,540	8,830	22,370

3.2.7 Three important conclusions can be derived from this data:

1) Flows on the Dartford Crossing will by 2030 be similar to that experienced in the baseline (2016) and comparable with flows now (in 2023). On that basis there will be **no** improvement to overall resilience of the crossing in terms of overall demand. The LTC will allow for dangerous goods to cross the river as an alternative to Dartford but even excluding those, general incidents at Dartford impact on vehicle flows at least 10 times per day resulting in an average impact

for an average 1.5 hours **every day**. As is well documented more significant events result in closures for extended periods of time.

2) It therefore follows that the number of incidents is likely to be similar post completion of the LTC.
3) The only improvement that would be seen is if the additional route (LTC) allows for the diversion of vehicles from the Dartford Crossing to LTC. Only a 10% shift in a one hour period from Dartford to LTC would mean the overall flows approaching LTC from the north at the A13 would increase by nearly 1,400 vehicles per hour.
4) Given the conclusions on the traffic modelling this could have a significantly adverse impact on Orsett Cock and Manorway Interchange.

3.2.8 The applicant has made no attempt to model this affect and that is a fundamental failing in the assessment process. In terms of DPWLG's interests the main impact this could have is that it will increase flows on the A13 generally and could also increase the number of U-turners at Orsett Cock. Because both Orsett Cock and Manorway Interchange junctions are operating at levels of significant stress, very small levels of additional change will have a disproportionate impact on junction operation.

3.2.9 This would occur because a proportion of traffic in the model approaching the A1089 will presumably be using the Dartford Crossing and M25 J30. Details of select link analysis to confirm the level of movement have been requested from the Applicant but have not been provided.

3.2.10 Reference has therefore been made to the Applicants Transport Assessment (TRO10032-001481-7.9 Para 7.3.27 confirms that 13% of traffic on the LTC is A1089 bound. By way of example if 1,400 vehicles diverted to LTC (as above 10% of hourly demand) as a result of a Dartford closure or delay and 13% of those are vehicles which otherwise would have used J30 and the A13 to reach Tilbury, the increase in U-turning traffic would be a further 200 vehicles. It is appropriate to assess the impact of this occurring in either of the peak hours (being the times when traffic flows are highest and therefore the impact of any incident more pronounced).

3.2.11 Given the junctions are already queuing, that is effectively an increased queue from zero to a 1.2km queue on the primary eastbound approach to Orsett Cock in the PM peak period. This will in turn mean more traffic will divert to Manorway (either as U-turn or reassigned trip via the B1007), and these have therefore been added to the assessment as summarised above.

3.2.12 Clearly this issue has the potential to cause a significant and materially different outcome to junction modelling than presented by the applicant. Given the effect of the Closure is likely to be a daily event (lasting on average 1.5 hours) that is material and should be properly assessed.

4.0 Summary and Conclusions

4.1 In summary therefore, the approach taken in the application fails to properly assess the impacts of the LTC on key local junctions on the A13 Corridor which in turn impact on the Port and Logistics Park and in particular:

i) The use of the Lower Thames Area Model (LTAM) is insufficiently detailed to suitably assess the impact of the LTC on a number of key highway links and junctions which play a critical role in the highway accessibility of the Port and Logistics Park. It does clearly show a significant increase on the A13 generally in the vicinity of the Port and Logistics Park.

ii) Related to the above, more detailed assessment of these junctions have been provided to Thurrock Council (TC) by the LTC team and these have been provided to DPWLG by TC. This modelling identifies significant additional congestion at the A13/A128 (Orsett Cock) roundabout junction as a direct result of LTC. It is considered that such congestion will cause a significant level of traffic to re-route via the A13/A1014 (Manorway Interchange) roundabout junction.

iii) This more localised and detailed modelling (which has not been provided as part of the submission) clearly and demonstrably conflicts with the suggested output of the LTAM model. Depending on what is submitted (and when) further representations may be necessary in due course.

iv) The above assessments demonstrate that the effect of additional traffic utilising the A13/A1014 junction, as a result of LTC, will have material adverse impacts on the operation of that junction, resulting in significant detrimental impacts on the accessibility of the Port and Logistics Park (noting this junction is the Port and Logistics Parks sole point of strategic highway access), particularly given the sensitivity of the junction to the type of additional traffic movements likely to occur.

v) The DCO submission does not consider the effects of the proposals in circumstances where the Dartford Crossing (Tunnel and QE2 Bridge) is suffering significant congestion or is closed to traffic. This is a frequent event (see Plate 4.8 of Report 7.1 – Need for the Project). These events resulted in an impact on traffic flows for an average of 1.5 hours per day in 2019.

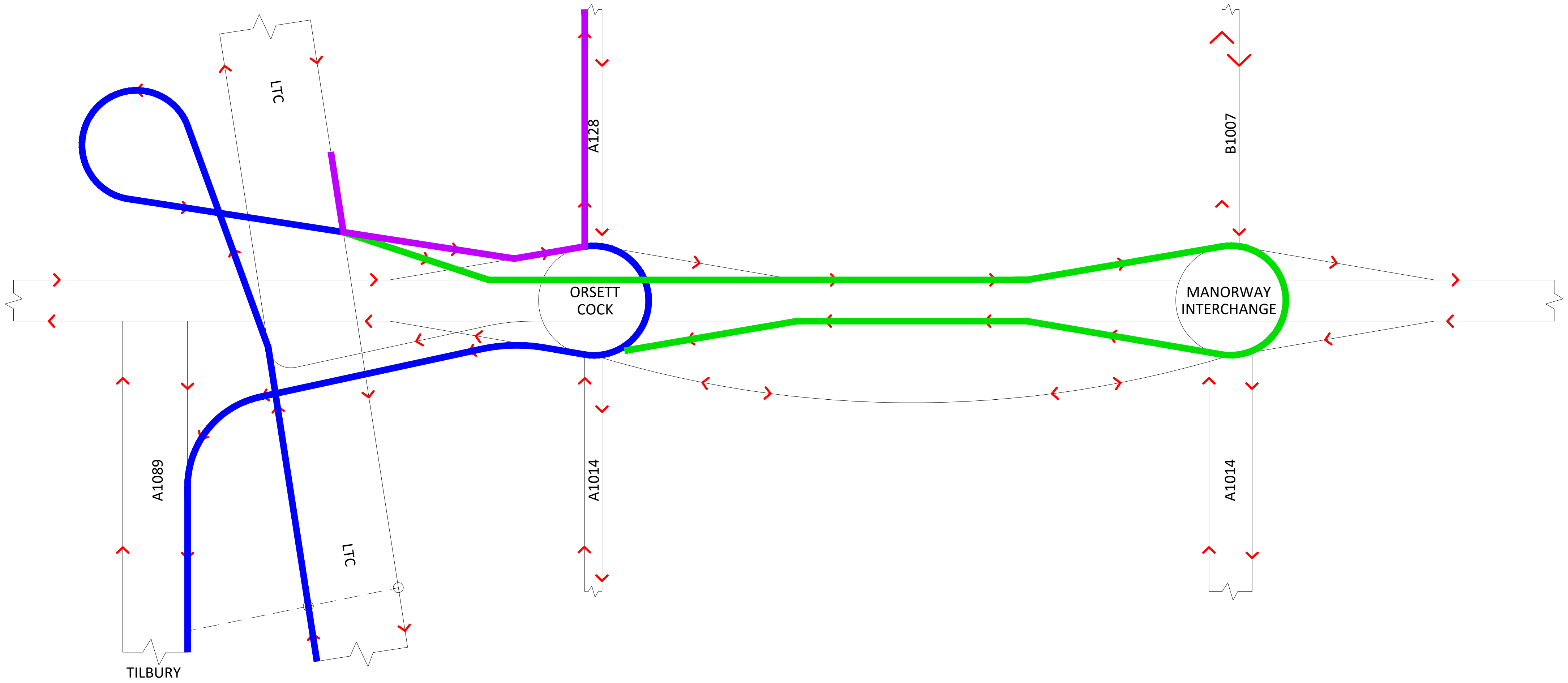
vi) One of the purported benefits of the scheme is to provide an alternative route in such scenarios and therefore the level of traffic re-routing to the above key junctions would likely be significant. This has not been assessed in the application.

vii) The DCO submission therefore fails suitably to assess the impact of the proposed scheme on the Orsett Cock and subsequently the Manorway junctions and, in doing so, fails to take full account of the potential impacts of the proposed LTC on the operational efficiency and resilience of the Port and the Logistics Park.

viii) Further modelling is required by the applicant to determine mitigation for these impacts and without that work the real impact on port cannot be known with any reasonable degree of certainty. It is therefore clear that the currently proposed mitigation in the form of ongoing monitoring of this critical route are insufficient to provide (or ensure delivery of) suitable mitigation in a timely manner or at all.

SJT/20491-02_Transport Issues - Final
18th July 2024

Appendix A



LOCATION PLAN

NOTES

- POTENTIAL ALTERNATIVE ROUTE
- CONGESTION
- MODELLED ROUTE

REVISIONS

REV	DATE	DESCRIPTION	DRAWN BY	CHECK BY
P1	05/05/2023	Initial Issue	BA	AB

PROJECT TITLE: DP WORLD				
DRAWING TITLE: LTC Northbound Tilbury Road Diagram				
RIBA STAGE: N/A	STATUS: Preliminary		DRAWN BY: AA	CHECKED BY: AD
SHEET: A3	SCALE: NTS	DATE: 05/05/2023	SUITABILITY: S3	REVISION: P1
DRAWING NO.: LG - ASA - SK - ZZ.ZZ - D - A - SK210 _ (S3 - P1)				

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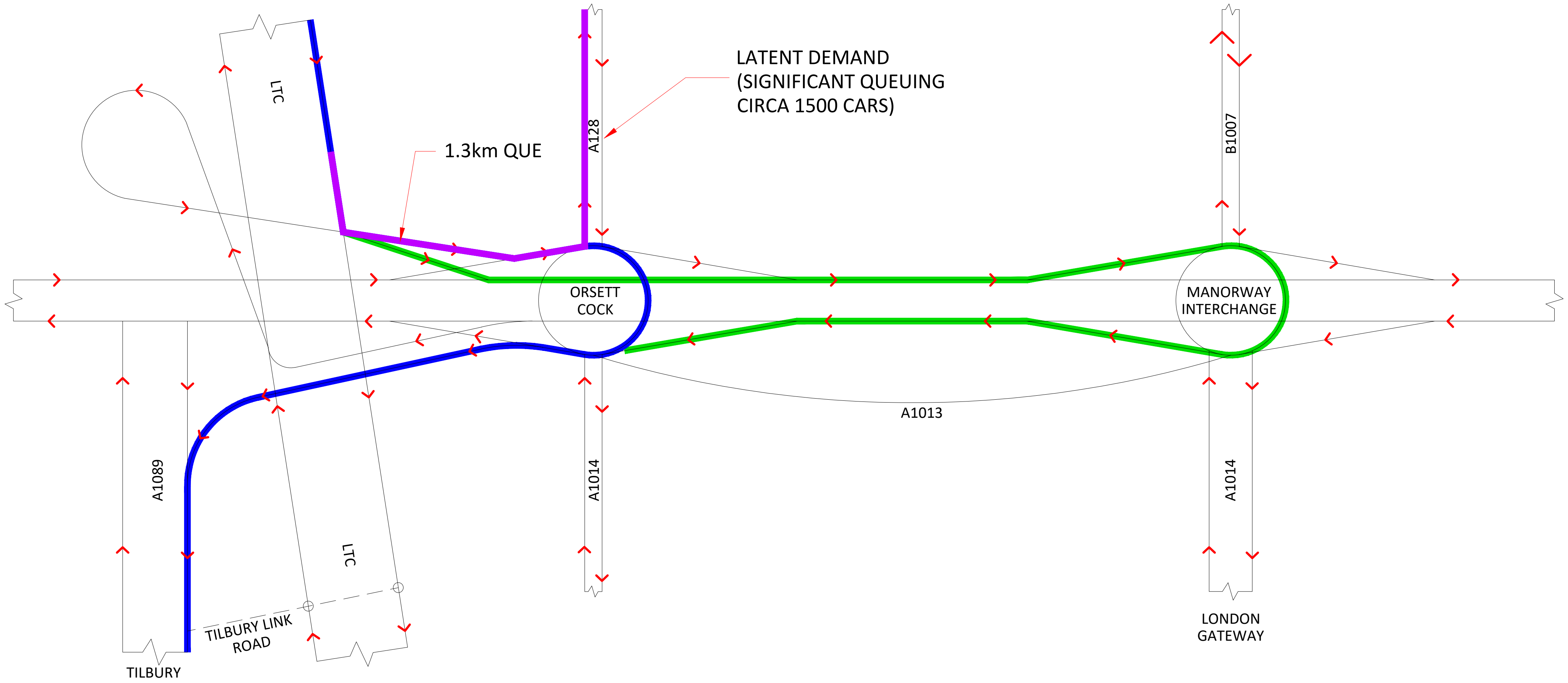
JOB NO. 18105



LOCATION PLAN

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P1	05/05/2023	Initial issue	BA	AB

REVISIONS

PROJECT TITLE
DP WORLD

DRAWING TITLE
LTC Southbound Tilbury Road Diagram

RIBA STAGE	STATUS	DRAWN BY	CHECKED BY
N/A	Preliminary	AA	AD

SHEET	SCALE	DATE	SUITABILITY	REVISION
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App 3

JOB NO. 18105

Appendix B

national highways

Lower Thames Crossing

Orsett Cock 2030 Operational Appraisal Design Release 4.3 Operational Modelling

DATE: August 2022

Planning Inspectorate Scheme Ref: TR010032
Document Ref: HE540039-LTC-TTM-GEN-REP-DCO-00001

VERSION: 1.0

App 5

Lower Thames Crossing

Orsett Cock 2030 Operational Appraisal

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1. Introduction

1.1 Purpose of document

1.1.1 The purpose of this document is to present the initial findings from the traffic operation appraisal undertaken for Design Release 4.3 (DR4.3) of the network in vicinity of the Orsett Cock junction including the A13/ A1089 and the A1013 Stanford Road/ Rectory Road junction.

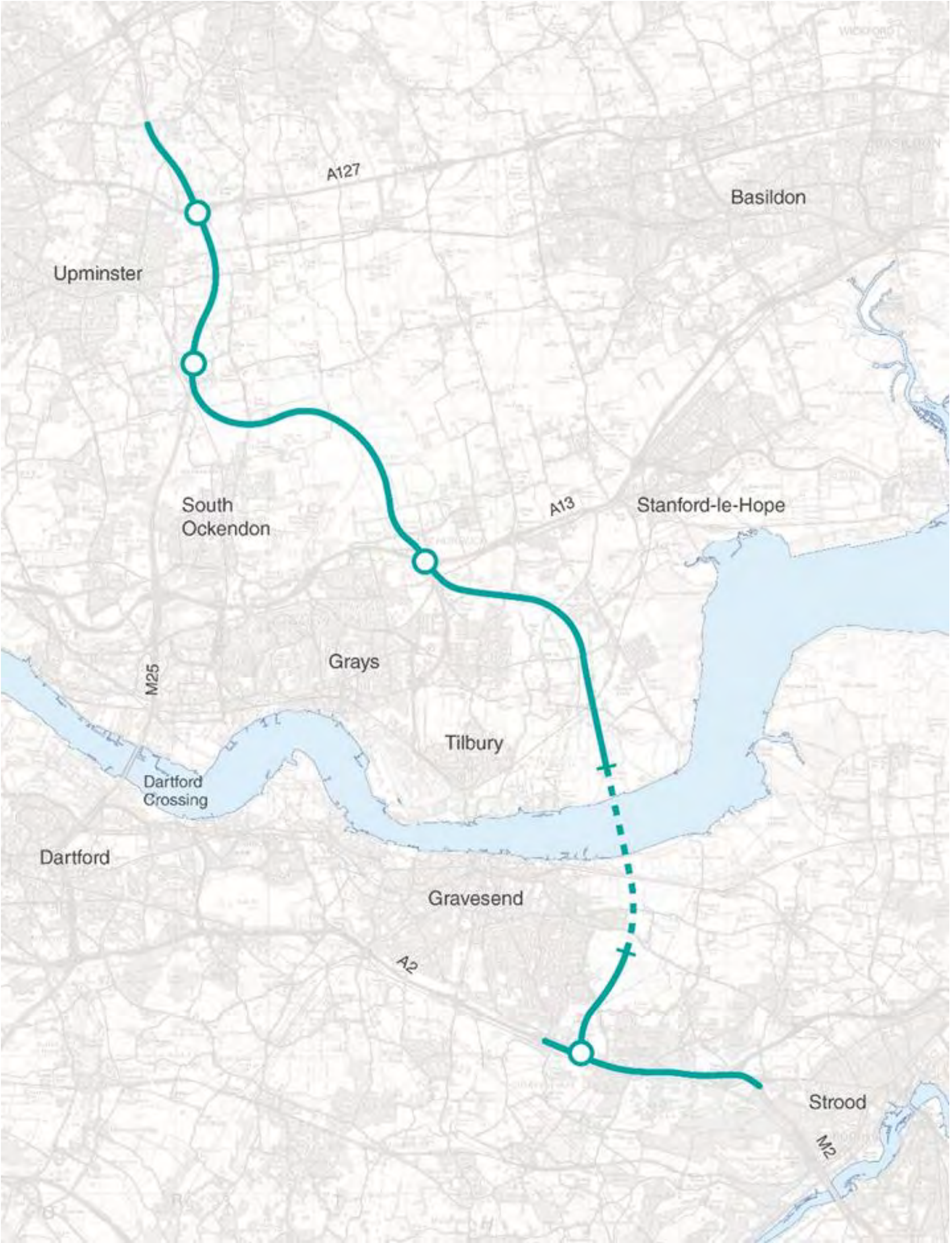
1.2 Modelling Software

1.2.1 Road traffic micro-simulation models represent individual vehicles travelling within the road network, providing realistic driver behaviour such as lane changing and overtaking. The micro-simulation software selected for the Lower Thames Crossing is VISSIM. The model has been developed in VISSIM version 2020 (SP13).

1.3 The Project

1.3.1 The A122 Lower Thames Crossing (the Project) would provide a connection between the A2 and M2 in Kent, east of Gravesend, crossing under the River Thames through a tunnel, before joining the M25 south of junction 29. The Project route is presented in Plate 1.1.

Plate 1.1 Lower Thames Crossing route



1.3.2 The A122 road would be approximately 23km long, 4.25km of which would be in tunnel. On the south side of the River Thames, the Project route would link the tunnel to the A2 and M2. On the north side, it would link to the A13 and junction 29 of the M25. The tunnel entrances would be located to the east of the village of Chalk on the south of the River Thames and to the west of East Tilbury on the north side.

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1.3.3 Junctions are proposed at the following locations:

- New junction with the A2 to the south-east of Gravesend
- Modified junction with the A13/ A1089 in Thurrock
- New junction with the M25 between junctions 29 and 30

1.3.4 To align with NPSNN policy and to help the Project meet the Scheme Objectives, it is proposed that road user charges would be levied. Vehicles would be charged for using the new tunnel.

1.3.5 The Project route would be three lanes in both directions, except for:

- link roads
- stretches of the carriageway through junctions
- the southbound carriageway from the M25 to the junction with the A13/ A1089, which would be two lanes

1.3.6 In common with other A-roads, the A122 would operate with no hard shoulder but would feature a 1m hard strip on either side of the carriageway. It would also feature technology including stopped vehicle and incident detection, lane control, variable speed limits and electronic signage and signalling. Our A122 road design outside of the tunnel includes emergency areas spaced at intervals between 800 metres and 1.6km (less than one mile). The tunnel would include a range of enhanced systems and response measures instead of emergency areas.

1.3.7 The A122 would be classified as an 'all-purpose trunk road' with green signs. For the benefit of safety, walkers, cyclists, horse-riders and slow-moving vehicles would be prohibited from using it.

1.3.8 The Project would include adjustment to a number of side roads. There would also be changes to a number of public rights of way, used by walkers, cyclists, and horse riders. Construction of the Project would also require the installation and diversion of a number of utilities, including gas pipelines, overhead power lines and underground electricity cables, as well as water supplies and telecommunications assets and associated infrastructure.

1.3.9 The Project has been developed to avoid or minimise significant effects on the environment. Some of the measures adopted include landscaping, noise mitigation, green bridges, floodplain compensation, new areas of ecological habitat and two new parks.

2. Modelling Scope

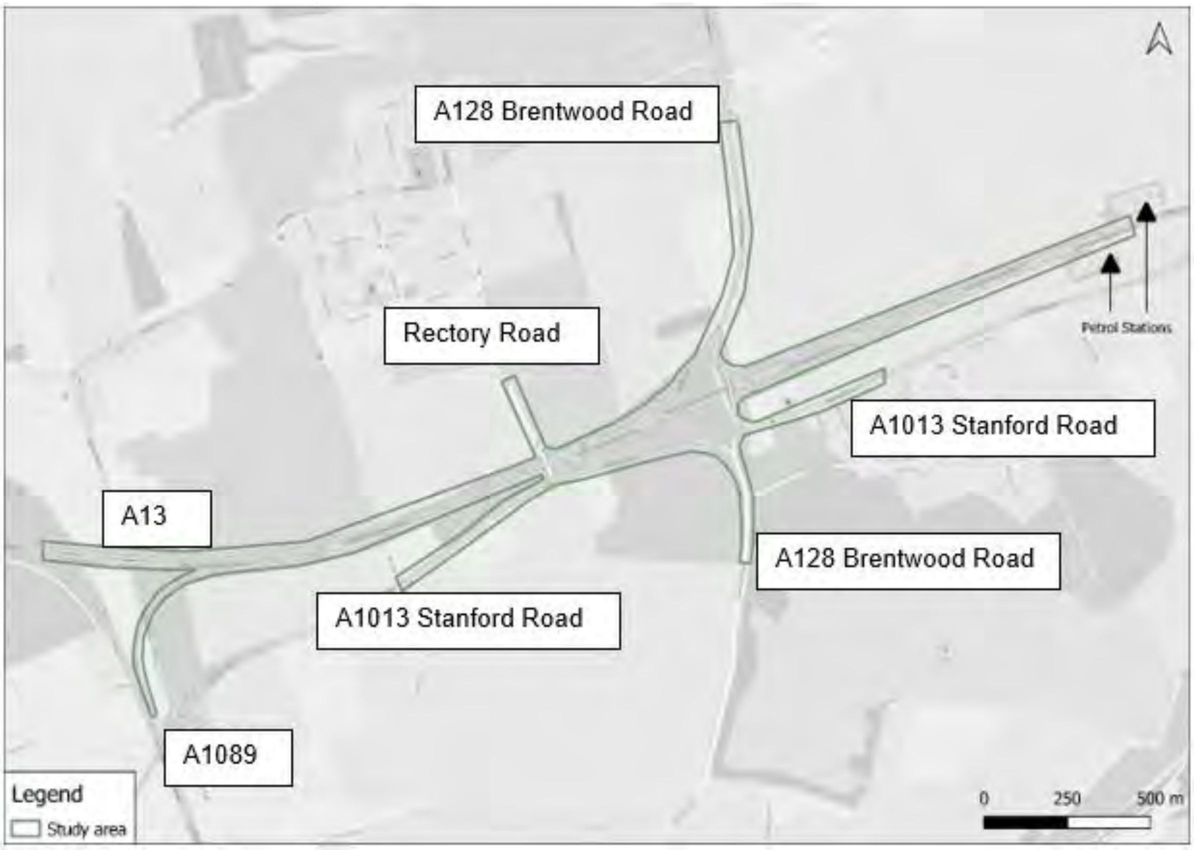
2.1.1 The traffic operation study area, modelling years and time periods have been defined based on our discussion and agreement with Thurrock Council and their consultant during a workshop on 14 December 2021.

2.1.2 The study area is located to the north-east of Grays and Plate 2.1 shows the extent of the study area covered by the VISSIM model. The section of the A13 in this area and the Orsett Cock junction recently had construction works completed as part of the A13 Widening Scheme between the Orsett Cock and the Manorway junctions, undertaken by Thurrock Council.

2.1.3 The Orsett Cock junction in 2016 was an unsignalized, grade-separated roundabout with two circulatory lanes. The A13 had three lanes in each direction west of the junction and two lanes east of Orsett Cock. The area of interest also extends to the westbound diverge from the A13 onto the A1089 in order to capture the anticipated changes proposed around the A13/ A1089 interchange in the Project.

2.1.4 The model also includes the A1013 Stanford Road/ Rectory Road unsignalized T- Junction, located just to the west of the Orsett Cock junction.

Plate 2.1 Traffic Operations Study Area



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2.1.5 The VISSIM base year model was developed to reflect the road network and traffic condition in 2016, before the construction work commenced. Accordingly, a Local Model Validation Report (LMVR) was issued in June 2022 explaining how the Base Year model was developed and validated for two time periods, namely:

- AM Peak Period (07:00 - 09:00) to capture the peak hour for the A13 and strategic road network (07:00–08:00) and the peak hour of the junction and local roads (08:00–09:00); and
- PM Peak Period (17:00 - 18:00).

2.1.6 Following this, a Do Minimum model representing forecast year 2030 without LTC and a 2030 Do Something model with LTC were developed.

2.1.7 This report explains how the Do Minimum (DM) and Do Something (DS) models were developed and compares results from the 2030 DS model with the results of the 2030 DM model for understanding how network operating conditions will change from Do Minimum without LTC to a Do Something with LTC.

3. 2030 Model Development & Forecasting

3.1 Introduction

3.1.1 This section describes the development of the 2030 DM and DS VISSIM models in terms of:

- Network Development
- Forecast Traffic Demand
- Traffic Signal Optimisation
- Model Calibration
- Initial Visual Observation
- Interim Improvements in the DS scenario

3.2 Network Development – Do Minimum

3.2.1 The 2030 DM network was developed from the 2016 Base Year network by incorporating the A13 Widening Scheme between the Orsett Cock and the Manorway junctions. This scheme was recently completed by Thurrock Council.

3.2.2 The principal network changes between the 2016 Base Year and the 2030 DM were:

- Introduction of an extra lane in both directions on the A13 east of Orsett Cock.
- Reconfiguration of the merges and diverges at the Orsett Cock junction with the A13 in both directions.
- Reconfiguration of the westbound on-slip to the A13 West with the slip road reduced to one lane.
- Reconfiguration of the A128 North approach with an extra flare lane.
- Reconfiguration of the A13 West approach (eastbound off-slip) with an extra flare lane.
- Introduction of an extra lane in the circulatory.
- Introduction of controlled pedestrian crossings and traffic signals on the A13 West and A13 East approaches.

3.3 Network Development – Do Something

3.3.1 The 2030 DS network was developed from the 2030 DM network by incorporating the highway design from Design Release 4.3 within the traffic operations study area for Orsett Cock. The principal network changes between the 2030 DM and 2030 DS models were:

- Introduction of new LTC links around the A13/ A1089 interchange.
- Reconfiguration of A13/ A1089 interchange.
- Reconfiguration of slip roads on the A13 west of Orsett Cock.

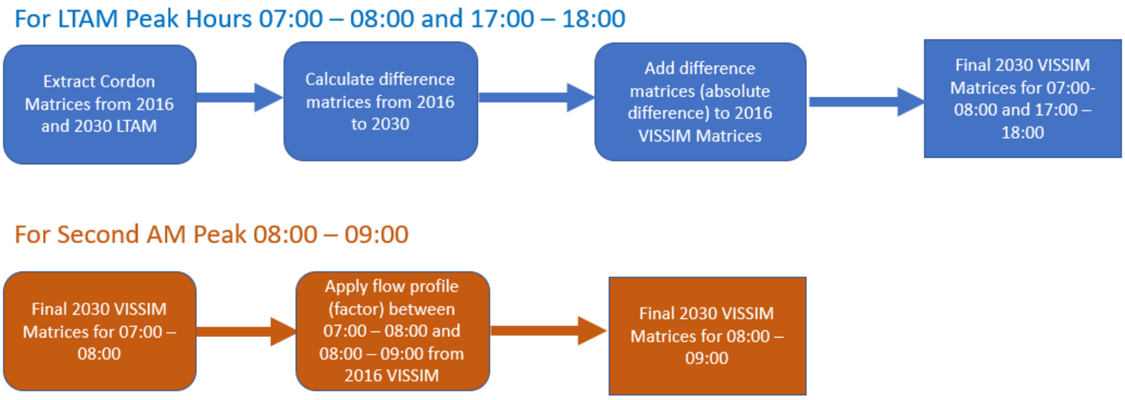
- Realignment of A1013 (West) Stanford Road.
- Introduction of traffic signals on the A128 North and A128 South approaches at Orsett Cock.
- Reconfiguration of the A1013/ Rectory Road junction.

3.3.2 The network coding for both DM and DS networks were undertaken using highway design drawings provided in AutoCAD and PDF format.

3.4 Forecast Traffic Demand

3.4.1 The forecast traffic demand matrices for each vehicle type in VISSIM were calculated as shown in Plate 3.1 and described in detail in subsequent sections.

Plate 3.1 Forecast Traffic Demand Calculation for VISSIM



3.4.2 The 2030 DM forecast traffic demand in VISSIM was determined by examining the differences in forecast traffic flows (for model zones) predicted by the 2016 Base Year and 2030 DM LTAM (CM45) models for the available hours of 07:00 – 08:00 in the AM Peak and 17:00 – 18:00 in the PM Peak.

3.4.3 The absolute differences in flows between these models were identified and then applied to the 2016 Base Year VISSIM model to develop the 2030 DM matrices. This was undertaken on the basis of origin-destination matrices so applying a matrix of 'flow differences' to the 2016 Base Year matrix to create the 2030 DM matrix.

3.4.4 Where applying absolute differences resulted in negative values, the percentage difference was used instead of the absolute difference. This was the case for the origin – destination pairs for which the LTAM forecast indicated negative growth. If the 2016 Base Year flows in VISSIM were lower than the LTAM Base flows, applying this negative flow difference would lead in some instances to a negative number, therefore it was preferred to use percentage difference instead where this occurred.

3.4.5 For the second hour in the AM (08:00 – 09:00), which is not available from LTAM, the existing flow base year profile in VISSIM (derived from count data) was used to factor the 2030 matrices from the 07:00 – 08:00 hour to the 08:00 – 09:00 hour.

3.4.6 The 2030 hourly matrices have been split into 15-minute intervals using the flow profiles from the base year VISSIM model. In summary, the comparison of the 2016 Base and 2030 DM traffic demands in Table 3.1 indicates that the overall traffic demand is forecast to increase by 30% in the AM peak hours and 26% in the PM peak hour.

Table 3.1 Traffic Volumes in Study Area by Scenario

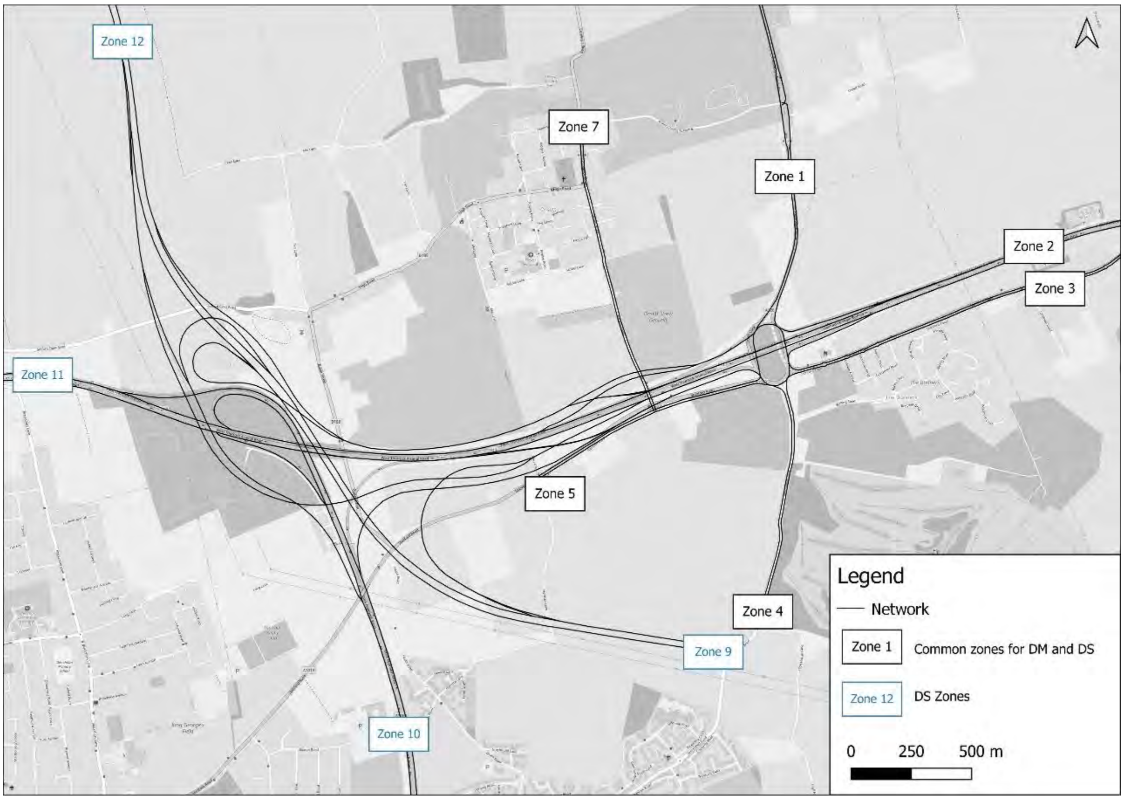
Peak	Vehicle Type	2016 Base	2030 DM	2030 DS	
				LTC mainline flows	Total *
AM (07:00 – 08:00)	Car	6698	8798	1807	14539
	LGV	1693	2040	599	3174
	HGV	739	1012	634	2370
	Total	9130	11850	3040	20084
AM (08:00 – 09:00)	Car	6790	8980	1807	14738
	LGV	1247	1495	599	2639
	HGV	822	1114	634	2487
	Total	8859	11589	3040	19863
PM (17:00 – 18:00)	Car	8172	10119	1784	17236
	LGV	1300	1634	418	2576
	HGV	386	655	541	1724
	Total	9858	12408	2742	21536

Note: * Total DS traffic volumes include LTC mainline flows

3.4.7 The 2030 DS forecast traffic demand matrices in VISSIM were determined using the same method as the 2030 DM, that is by examining the differences in forecast traffic flows predicted by the 2016 Base Year and 2030 DS (CS67) LTAM models.

3.4.8 There are new zones associated with the new traffic from LTC in the 2030 DS model. The new zones are shown in Plate 3.2 below. The traffic demand and the distributions for these zones were taken directly from the LTAM cordon matrices and added to the VISSIM matrices.

Plate 3.2 2030 DS VISSIM Zones



3.4.9 Similar to the 2030 DM matrices, for the second hour in the AM (08:00 – 09:00) which is not available from LTAM, flow matrices were derived using the existing base year flow profile between 07:00 – 08:00 and 08:00 – 09:00.

3.4.10 The 2030 DS hourly matrices were also split into 15-minute intervals using the existing flow profiles from the VISSIM base year model. In summary, the comparison of the 2030 DM and DS traffic demands in Table 3.1 indicates that the overall traffic demand in the study area increases by approximately 70% between the DM and DS scenarios in the AM and PM peak hours.

3.4.11 It should be noted that the 2030 DM vs 2030 DS is not a direct comparison for traffic demands at the Orsett Cock junction as the 2030 DS total volume includes the mainline traffic travelling north-south on the new LTC links. For clarity the LTC mainline traffic volumes have been shown separately in Table 3.1 above.

3.5 Public Transport

3.5.1 Bus services and location of bus stops in the DM and DS models were assumed to remain consistent with those in the Base Year model.

3.6 Traffic Signals Optimisation

3.6.1 The operation of traffic signals in the 2030 DM and DS network were initially optimised using LinSIG models and then further fine-tuned in VISSIM to reflect the small changes in demand and arrival pattern of vehicles in the 15-minute intervals.

3.6.2 A cycle time of 60 seconds was used in the 2030 DM and DS models.

3.7 DM and DS VISSIM Model Calibration

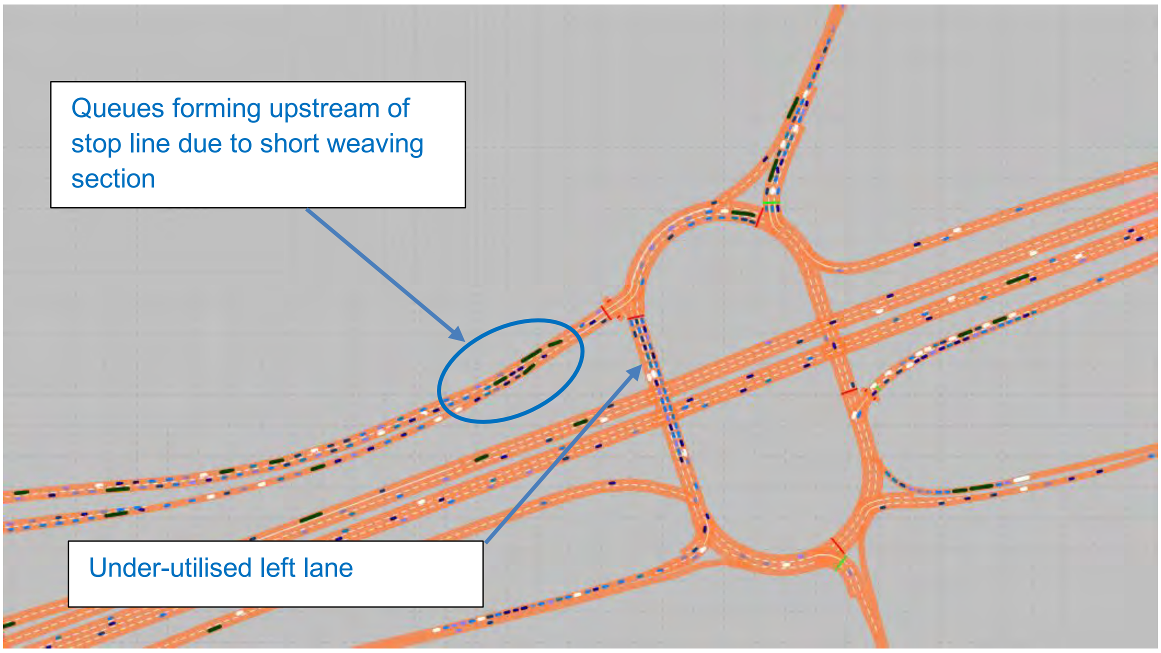
3.7.1 The network coding method and model parameters used in the DM and DS models were largely consistent with those calibrated in the base year model. However, due to changes of the network layout at the Orsett Cock junction, some parameters were adjusted in the DM and DS models to provide more realistic driving behaviours to reflect the new layout. These adjustments and the justifications for the changes are summarised below:

- The speed distributions of the desired speed and reduced speed areas on the circulatory were reduced by 10% to reflect the new circulatory carriageway lane configuration in the DM and DS models, compared to the base model.
- The circulatory has two lanes in the base model and most of the links use the standard “Urban (motorized)” link behaviour type, except for a short three-lane section just before the A1013 (W) exit which uses the “Urban (merge)” link type to allow smoother lane change behaviour, as there will be more lane changes and weaving in the three-lane section. Given the whole circulatory is widened to three lanes in the DM and DS models, all circulatory links in these models have been adjusted to use the “Urban (merge)” link type.

3.8 Initial Visual Observations

3.8.1 Visual observations during the simulation runs of the DS models indicated the traffic behaviour upstream of the traffic signals at the A13 West approach and its circulatory, were impacting the efficiency of these traffic signals. These are shown in Plate 3.3 and summarised below.

Plate 3.3 Traffic Behaviour at A13 West & Circulatory



Weaving on the A13 West approach

3.8.2 The section where traffic from LTC and the A13 merges on the A13 West approach has a modelled length of 90m. The model indicated that this merge length needs increasing as a large number of vehicles from LTC needs to be in the middle and right-hand lanes while much of the traffic from the A13 needs to use the middle and left-hand lanes for the A128 (N) exit. This causes a bottleneck upstream of the stop line with queues predicted to extend to the A13 mainline.

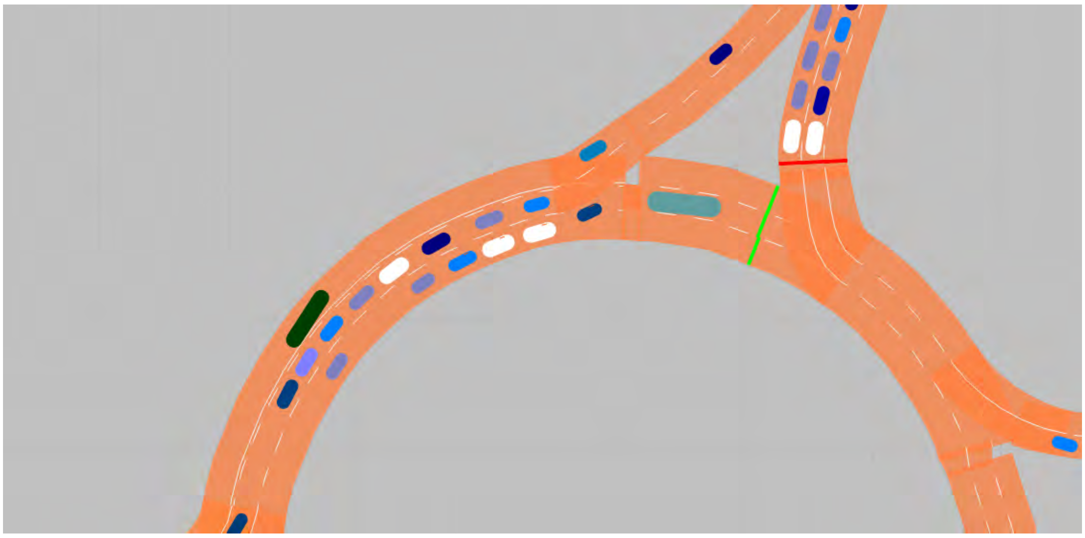
Under-utilised left lane on the western overbridge

3.8.3 The lane markings on the eastern overbridge are currently marked with the left lane dedicated for the A128 (N), middle lane for the A128 (N) & A13 (E) and right lane for the A13 (E) & A1013. The volume of traffic travelling from the circulatory to the A128 (N) is relatively low in comparison to other movements which resulted in the left lane being under-utilised.

Lane change at the northern circulatory

3.8.4 As shown in Plate 3.4, traffic travelling from the right-hand lane on the western overbridge needs to change to the middle lane for the A13 (E) exit. This causes delays upstream of the stop line.

Plate 3.4 Lane change in northern circulatory



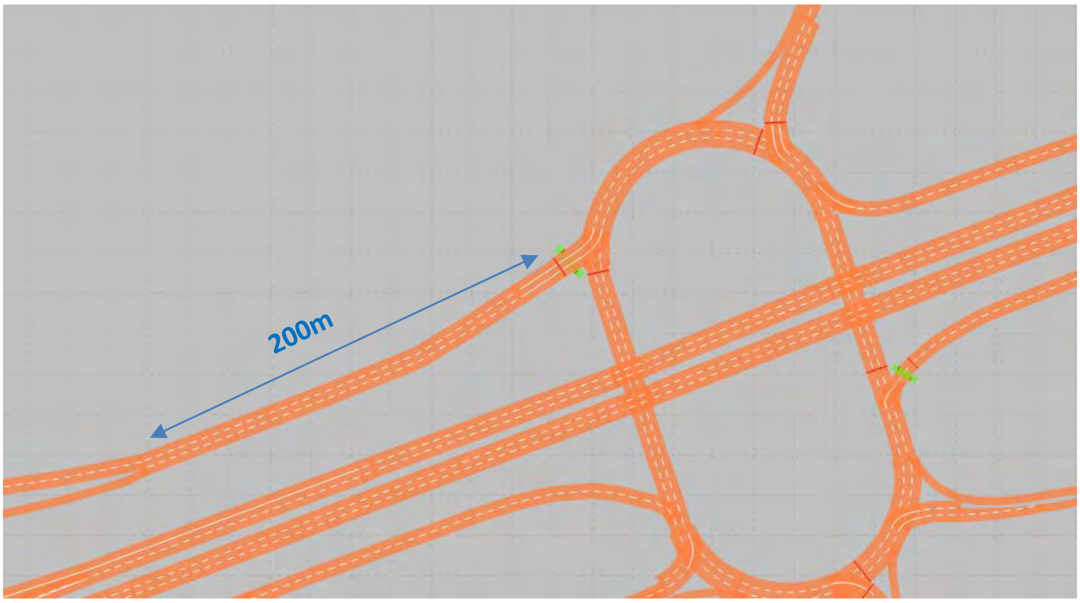
3.9 Improvements for the DS Network

3.9.1 Following discussions with the LTC team, it was agreed to implement the changes described below to the DS network in VISSIM as a provisional improvement. These are currently limited to changes on the slip roads connecting LTC to the A13 (W), and minor changes to the lane markings at the Orsett Cock junction. Any requirements for further improvements at the Orsett Cock junction will be determined following discussions with Thurrock Council based on the results from the models presented in the next chapter.

A13 West approach Improvement

3.9.2 The improved DS network increases the modelled length of the section where traffic from LTC and the A13 merges on the A13 West approach, from 90m to 200m as shown in Plate 3.5.

Plate 3.5 A13 West approach improvement

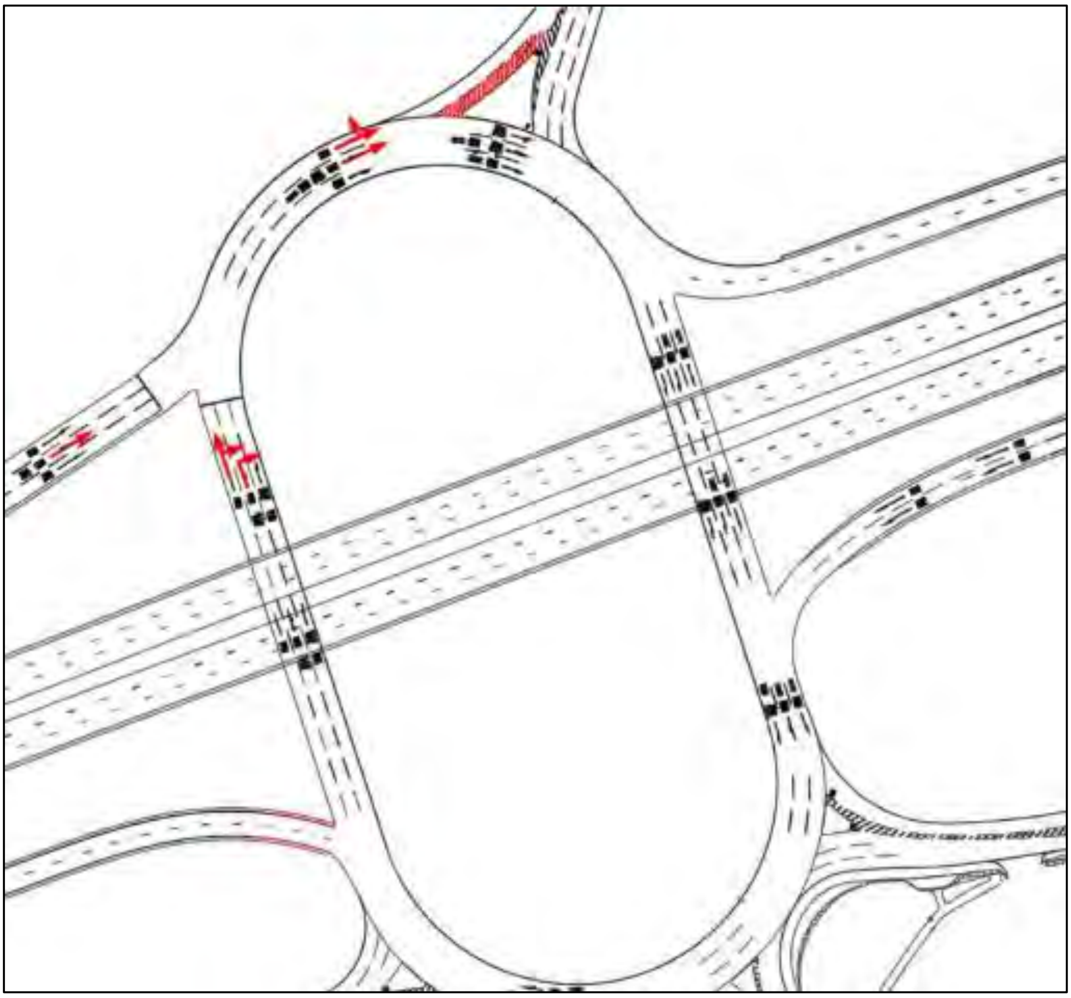


Modified Lane Markings at A128 (N) exit

3.9.3 The purpose of this modification is to achieve a more even spread in lane usage on the western overbridge and avoid traffic changing lanes in the northern circulatory for the A13 (E) exit. The modification as shown in Plate 3.6 includes the following changes:

- Reduce the A128 (N) exit to one lane
- Allow traffic to use the left lane on the western overbridge for the A13 (E) exit

Plate 3.6 Modified Lane Markings at A128(N) exit



Modified Lane Markings at A128 (N) exit

3.9.4 The westbound on-slip on the A13 West exit is one lane in the DM network. This has been modified to two lanes in the DS network so as to tie in with the LTC design which has two lanes on the slip road.

4. Traffic Condition Analysis

4.1 Introduction

4.1.1 This section compares the results of the 2030 DM and DS VISSIM models in terms of the following traffic condition indicators:

- Average delays per vehicle
- Average queues
- Predicted journey times
- Relative delays on links

4.1.2 Both AM and PM Do Something models used in this analysis includes all the improvements described in Section 3.9.

4.1.3 Consistent with the base year model validation, the results of the DM and DS models are the averages of the same 20 random seeds used in the base model.

4.2 Junctions Traffic Condition

4.2.1 The predicted traffic conditions at the Orsett Cock and A1013/ Rectory Road junctions shown in Table 4.1 to Table 4.3 have been measured in terms of the total throughput flow in vehicles, average delay per vehicle and average queue length in meters for each hour within the AM and PM peak period.

4.2.2 The total throughput flows are the sum of the flows on all movements from each approach.

4.2.3 The average delay per vehicle is calculated by taking the weighted average of the delay from all movements on each approach. It should be noted that for the Orsett Cock junction, the delays are measured for each vehicle completing the full movement from the entry to the exit, therefore including delays from the traffic signals on the circulatory.

4.2.4 The average queue lengths are calculated by taking the average of the maximum queue length in each five-minute interval. This is more reliable in comparison to taking the maximum queue length over a one-hour interval, where the maximum queue can sometimes be misleading as it may have occurred only for a very short time/ single time step during the simulation. Vehicles are defined to be in a queue when their headway and speed drops below 20 meters and 3.1mph respectively and exit the queue when their speed increases above 6.2mph.

Table 4.1 AM 07:00 – 08:00 Traffic Condition

AM peak 7.00 - 8.00										
Junction	Approach	Throughput Flow (veh)			Avg. Delay per veh (s)			Mean Max. Queue (m)		
		2016 Base	2030 DM	2030 DS	2016 Base	2030 DM	2030 DS	2016 Base	2030 DM	2030 DS
Orsett Cock	A128 Brentwood Rd (North)	632	712	683	13	22	86	37	25	120
	A13 (East)	676	942	760	2	4	36	37	59	54
	A1013 Stanford Rd (East)	655	659	685	47	18	48	114	33	75
	A128 Brentwood Rd (South)	602	717	722	40	73	74	55	226	136
	A1013 Stanford Rd (West)	599	793	643	46	63	70	97	174	84
	A13 (West)	497	479	1431	10	3	7	93	38	62
A1013 Stanford Road / Rectory Road	Rectory Rd	136	190	272	9	23	52	13	56	66
	Stanford Rd (East)	833	977	854	6	5	8	10	13	41
	Stanford Rd (West)	557	720	563	3	3	3	-	-	-

4.2.5 At the Orsett Cock junction, Table 4.1 shows that the traffic conditions in the 2030 DM scenario on the A128 (N), A13 (E), A1013 (E) and A13 (W) approaches are predicted to be in free-flowing condition with delays of less than 35 seconds and short queues during the 07:00 – 08:00 period.

4.2.6 Delays on the A128 Brentwood Road (S) and A1013 Stanford Road (West) approaches respectively, increase in the 2030 DM scenario compared to 2016, with queues on the A128 Brentwood Road (S) extending past the junction with Welling Road.

4.2.7 In general, delays at Orsett Cock junction increase on all approaches in the 2030 DS scenario compared to the 2030 DM scenario. However, the predicted queues on all approaches can be accommodated within the available safe storage space.

4.2.8 The greatest increase in delay is on the A128 Brentwood Road (N) in the 2030 DS scenario. This approach is signalised in the DS scenario and has short green times in order to prioritise the circulatory to minimise queueing on the circulating carriageway due to the short storage space available.

4.2.9 The delays on the A128 Brentwood Road (S) and A1013 Stanford Road (W) approaches increase, but the respective queues are predicted to be shorter in the 2030 DS scenario compared to 2030 DM scenario. This is because the demand flows on these approaches are higher in the 2030 DM scenario.

4.2.10 At the A1013 Stanford Road/ Rectory Road junction, traffic conditions remain free-flowing in the 2030 DM scenario. There are small increases in delays and queues on Rectory Road and Stanford Road (E) in the 2030 DS scenario. The increase in queues on Stanford Road (E) is due to the removal of the right turn pocket resulting in right turning vehicles blocking the ahead traffic.

Table 4.2 AM 08:00 – 09:00 Traffic Condition

AM peak 8.00 - 9.00										
Junction	Approach	Throughput Flow (veh)			Avg. Delay per veh (s)			Mean Max. Queue (m)		
		2016 Base	2030 DM	2030 DS	2016 Base	2030 DM	2030 DS	2016 Base	2030 DM	2030 DS
Orsett Cock	A128 Brentwood Rd (North)	695	790	792	23	24	144	51	31	285
	A13 (East)	788	892	754	6	4	37	47	56	55
	A1013 Stanford Rd (East)	637	619	654	94	17	59	153	31	71
	A128 Brentwood Rd (South)	610	824	783	207	93	93	127	506	173
	A1013 Stanford Rd (West)	722	843	795	59	104	174	109	473	387
	A13 (West)	506	478	1504	11	3	8	85	38	67
A1013 Stanford Road / Rectory Road	Rectory Rd	205	201	377	11	74	301	16	223	244
	Stanford Rd (East)	1141	980	869	8	7	10	13	31	58
	Stanford Rd (West)	620	798	622	3	39	13	-	-	-

4.2.11 In the 2030 DM 08:00 – 09:00 period, the traffic conditions on the A128 (N), A13 (E), A1013 (E) and A13 (W) approaches are similar to the 07:00 – 08:00 period and are predicted to be in free-flowing condition with delays of less than 35 seconds.

4.2.12 Both the A128 Brentwood Road (S) and A1013 Stanford Road (W) approaches are over saturated in the 2030 DM scenario with long queues. The queue on the A128 Brentwood Road (S) approach is predicted to extend past the Orsett Golf Club and the queue on the A1013 (W) approach is predicted to extend past Rectory Road.

4.2.13 Similar to the 07:00 – 08:00 period, there are increased delays on all approaches at the Orsett Cock junction in the 2030 DS scenario compared to the 2030 DM scenario. The predicted queues on most approaches can be accommodated within the available safe storage space, except for the A1013 Stanford Road (W) approach where the queue reaches just east of Rectory Road.

4.2.14 Traffic delays increase most on the A128 Brentwood Road (N) in the 2030 DS scenario compared to the DM scenario with delays increasing by 120s resulting in a 285m queue.

4.2.15 The A128 Brentwood Road (S) approach has similar delays in the 2030 DM and 2030 DS scenarios, but much shorter queues in the 2030 DS scenario due to the lower demand flow.

4.2.16 The A1013 Stanford Road (W) approach remains over saturated in the 2030 DS scenario. Delays are predicted to increase but queues are predicted to be shorter in the 2030 DS scenario compared to 2030 DM scenario due to the lower demand flow in the 2030 DS scenario.

4.2.17 At the A1013 Stanford Road/ Rectory Road junction, delays and queueing increase in both the 2030 DM and DS scenarios compared to the 2016 base year. Rectory Road is over saturated with long queues in both scenarios.

Table 4.3 PM 17:00 – 18:00 Traffic Condition

PM peak 17.00 - 18.00										
Junction	Approach	Throughput Flow (veh)			Avg. Delay per veh (s)			Mean Max. Queue (m)		
		2016 Base	2030 DM	2030 DS	2016 Base	2030 DM	2030 DS	2016 Base	2030 DM	2030 DS
Orsett Cock	A128 Brentwood Rd (North)	854	837	828	51	26	156	88	36	383
	A13 (East)	442	667	547	10	3	295	87	47	222
	A1013 Stanford Rd (East)	501	498	510	22	15	42	34	19	40
	A128 Brentwood Rd (South)	410	493	494	13	39	57	19	37	43
	A1013 Stanford Rd (West)	988	993	906	30	42	64	135	71	46
	A13 (West)	805	700	1968	29	3	25	467	37	673
A1013 Stanford Road / Rectory Road	Rectory Rd	311	314	343	21	32	154	34	142	149
	Stanford Rd (East)	680	939	846	6	6	13	10	22	73
	Stanford Rd (West)	855	979	891	4	3	5	-	-	-

4.2.18 In the PM peak, traffic conditions at the Orsett Cock junction are free-flowing in the 2030 DM scenario.

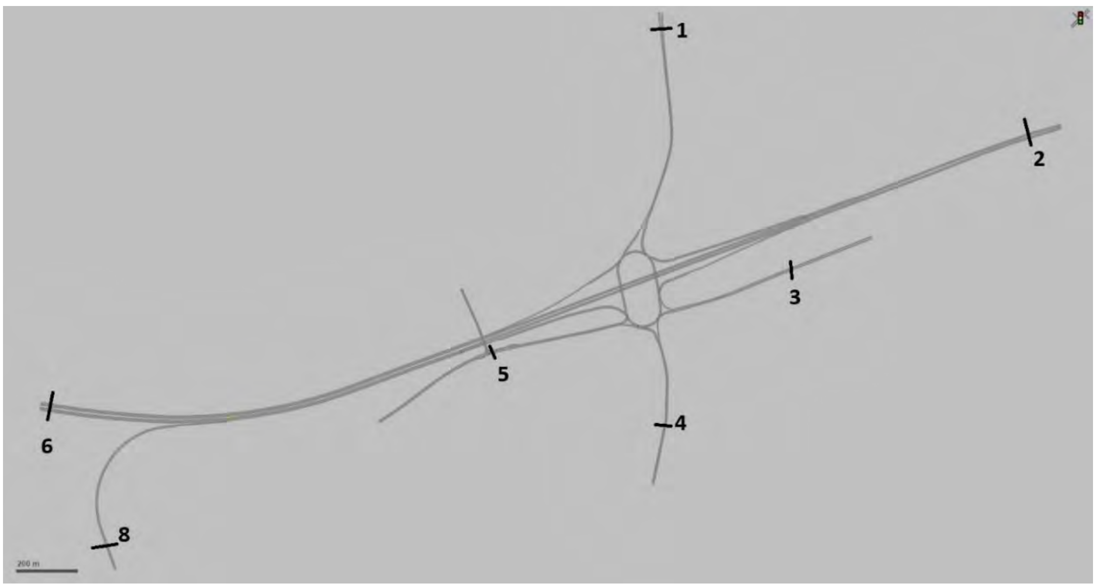
4.2.19 In the 2030 DS scenario, the Orsett Cock junction is predicted to be over-saturated in the PM peak with delays and queues on the A128 (N), A13 (E) and A13 (W) approaches.

4.2.20 At the A1013 Stanford Road/ Rectory Road junction, delays and queues on Rectory Road increase in both the 2030 DM and 2030 DS scenarios compared to the base year with long queues in both scenarios. The queues on Stanford Road (E) also increase in the 2030 DS scenario due to the removal of the right turn pocket resulting in right turning vehicles blocking the ahead traffic.

4.3 Journey Times

4.3.1 Journey time comparison has been carried out on the same routes used for the base year model validation. These cover all movements between the origins and destinations illustrated in Plate 4.1.

Plate 4.1 Journey Time Start and End Locations (DM)



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4.3.2 Table 4.4 to Table 4.6 show a summary comparing the journey times for the 2016 Base Year, 2030 DM and 2030 DS for the AM and PM peak periods.

Table 4.4 Journey Time Comparison AM 07:00 – 08:00

Route	Name	2016 Base			2030 DM			2030 DS		
		Distance [m]	JT [s]	Speed [mph]	Distance [m]	JT [s]	Speed [mph]	Distance [m]	JT [s]	Speed [mph]
1-->2	A128 Brentwood Rd (North) to A13 EB mainline	2084	109	42.8	2122	123	38.6	2122	189	25.2
1-->3	A128 Brentwood Rd (North) to A1013 Stanford Rd (East)	1381	102	30.3	1396	118	26.5	1396	182	17.1
1-->4	A128 Brentwood Rd (North) to A128 Brentwood Rd (South)	1341	90	33.3	1347	107	28.1	1347	172	17.5
1-->5	A128 Brentwood Rd (North) to A1013 Stanford Rd (West)	1555	107	32.4	1533	125	27.5	1535	195	17.6
1-->6	A128 Brentwood Rd (North) to A13 WB mainline	3051	152	45.0	3025	196	34.5	3036	242	28.0
1-->8	A128 Brentwood Rd (North) to A13 WB off-slip to A1089	3189	164	43.5	2439	175	31.2	3071	244	28.1
2-->1	A13 WB mainline to A128 Brentwood Rd (North)	2343	144	36.3	2360	160	32.9	2359	184	28.6
2-->3	A13 WB mainline to A1013 Stanford Rd (East)	1629	101	36.1	1653	100	36.9	1653	111	33.3
2-->4	A13 WB mainline to A128 Brentwood Rd (South)	1588	89	39.8	1605	89	40.2	1605	101	35.5
2-->5	A13 WB mainline to A1013 Stanford Rd (West)	1803	106	37.9	1791	107	37.5	1793	124	32.5
2-->6	A13 WB mainline to A13 WB mainline	3177	119	59.7	3177	118	60.3	3178	120	59.4
2-->8	A13 WB mainline to A13 WB off-slip to A1089	3315	131	56.4	3315	131	56.7	3329	173	43.0
3-->1	A1013 Stanford Rd (East) to A128 Brentwood Rd (North)	1563	151	23.1	1590	143	24.8	1589	180	19.7
3-->2	A1013 Stanford Rd (East) to A13 EB mainline	2176	158	30.8	2215	160	30.9	2216	210	23.7
3-->4	A1013 Stanford Rd (East) to A128 Brentwood Rd (South)	808	96	18.8	835	72	25.8	835	97	19.3
3-->5	A1013 Stanford Rd (East) to A1013 Stanford Rd (West)	1022	113	20.2	1021	90	25.4	1023	119	19.2
3-->6	A1013 Stanford Rd (East) to A13 WB mainline	2517	157	35.8	2513	161	34.8	2523	167	33.8
3-->8	A1013 Stanford Rd (East) to A13 WB off-slip to A1089	2655	170	35.0	1927	140	30.8	2559	169	33.9
4-->1	A128 Brentwood Rd (South) to A128 Brentwood Rd (North)	1397	128	24.4	1431	206	15.5	1430	180	17.7
4-->2	A128 Brentwood Rd (South) to A13 EB mainline	2010	135	33.3	2056	223	20.6	2057	209	22.0
4-->3	A128 Brentwood Rd (South) to A1013 Stanford Rd (East)	1307	128	22.9	1330	218	13.6	1330	203	14.6
4-->5	A128 Brentwood Rd (South) to A1013 Stanford Rd (West)	856	90	21.3	862	152	12.6	864	119	16.2
4-->6	A128 Brentwood Rd (South) to A13 WB mainline	2351	134	39.2	2354	224	23.5	2364	167	31.7
4-->8	A128 Brentwood Rd (South) to A13 WB off-slip to A1089	2489	147	38.0	1768	203	19.5	2400	169	31.8
5-->1	A1013 Stanford Rd (West) to A128 Brentwood Rd (North)	1452	133	24.4	1465	167	19.6	1474	156	21.2
5-->2	A1013 Stanford Rd (West) to A13 EB mainline	2066	140	32.9	2090	184	25.4	2101	185	25.4
5-->3	A1013 Stanford Rd (West) to A1013 Stanford Rd (East)	1363	133	22.9	1364	179	17.0	1375	179	17.2
5-->4	A1013 Stanford Rd (West) to A128 Brentwood Rd (South)	1322	122	24.3	1315	168	17.5	1326	169	17.6
5-->6	A1013 Stanford Rd (West) to A13 WB mainline	2407	139	38.6	2387	185	28.9	2409	143	37.8
5-->8	A1013 Stanford Rd (West) to A13 WB off-slip to A1089	2545	152	37.5	1802	164	24.6	2445	145	37.8
6-->1	A13 EB mainline to A128 Brentwood Rd (North)	2767	162	38.2	2770	153	40.4	2775	150	41.4
6-->2	A13 EB mainline to A13 EB mainline	3345	121	62.0	3347	122	61.6	3347	126	59.6
6-->3	A13 EB mainline to A1013 Stanford Rd (East)	2678	162	36.9	2669	165	36.1	2676	173	34.6
6-->4	A13 EB mainline to A128 Brentwood Rd (South)	2637	150	39.2	2621	155	37.9	2627	163	36.1
6-->5	A13 EB mainline to A1013 Stanford Rd (West)	2852	168	38.1	2807	172	36.5	2815	185	34.0
6-->8	A13 EB mainline to A13 WB off-slip to A1089	4485	224	44.7	3713	222	37.3	4351	235	41.5

4.3.3 The journey time comparison between the 2030 DM scenario and the 2016 Base Year for the 07:00 – 08:00 period shows the following:

- Journey times in the DM are generally similar or slightly higher than the base year across the majority of the routes, except for those routes originating from the A128 (S) and A1013 (W) where journey times increase on average by 60s due to the delays on these approaches as described in the previous section.

4.3.4 The journey time comparison between the 2030 DS and 2030 DM scenarios for the 07:00 – 08:00 period shows the following:

- Journey times in the DS scenario are generally higher than the DM scenario across the majority of the routes, except for those routes originating from the A128 (S) and the A1013 (W) where journey times decrease in the DS scenario.
- The journey time from the A13 (E) to the A1089 increases more than the journey times from the A13 (E) to other destinations, as traffic travelling from the A13 (E) to the A1089 is required to travel through the Orsett Cock junction in the DS scenario.
- Journey times in the DS scenario on the A13 mainline are similar to the DM scenario in both directions.

Table 4.5 Journey Time Comparison AM 08:00 – 09:00

Route	Name	2016 Base			2030 DM			2030 DS		
		Distance [m]	JT [s]	Speed [mph]	Distance [m]	JT [s]	Speed [mph]	Distance [m]	JT [s]	Speed [mph]
1-->2	A128 Brentwood Rd (North) to A13 EB mainline	2084	119	39.3	2122	125	38.0	2122	248	19.2
1-->3	A128 Brentwood Rd (North) to A1013 Stanford Rd (East)	1381	112	27.6	1396	121	25.8	1396	239	13.1
1-->4	A128 Brentwood Rd (North) to A128 Brentwood Rd (South)	1341	99	30.1	1347	109	27.5	1347	229	13.2
1-->5	A128 Brentwood Rd (North) to A1013 Stanford Rd (West)	1555	119	29.3	1533	128	26.7	1535	253	13.6
1-->6	A128 Brentwood Rd (North) to A13 WB mainline	3051	161	42.3	3025	190	35.6	3036	299	22.7
1-->8	A128 Brentwood Rd (North) to A13 WB off-slip to A1089	3189	174	41.0	2439	169	32.3	3071	301	22.8
2-->1	A13 WB mainline to A128 Brentwood Rd (North)	2343	157	33.4	2360	161	32.9	2359	186	28.3
2-->3	A13 WB mainline to A1013 Stanford Rd (East)	1629	115	31.7	1653	100	36.8	1653	115	32.2
2-->4	A13 WB mainline to A128 Brentwood Rd (South)	1588	103	34.7	1605	89	40.3	1605	105	34.2
2-->5	A13 WB mainline to A1013 Stanford Rd (West)	1803	122	33.1	1791	108	37.1	1793	129	31.1
2-->6	A13 WB mainline to A13 WB mainline	3177	118	60.1	3177	117	60.8	3178	120	59.2
2-->8	A13 WB mainline to A13 WB off-slip to A1089	3315	131	56.7	3315	130	57.1	3329	177	42.0
3-->1	A1013 Stanford Rd (East) to A128 Brentwood Rd (North)	1563	187	18.7	1590	142	25.0	1589	186	19.1
3-->2	A1013 Stanford Rd (East) to A13 EB mainline	2176	196	24.8	2215	159	31.1	2216	219	22.7
3-->4	A1013 Stanford Rd (East) to A128 Brentwood Rd (South)	807	133	13.6	835	71	26.5	835	105	17.8
3-->5	A1013 Stanford Rd (East) to A1013 Stanford Rd (West)	1022	152	15.1	1021	90	25.5	1023	129	17.7
3-->6	A1013 Stanford Rd (East) to A13 WB mainline	2517	194	29.0	2513	151	37.2	2523	175	32.2
3-->8	A1013 Stanford Rd (East) to A13 WB off-slip to A1089	2655	207	28.7	1927	130	33.2	2559	177	32.3
4-->1	A128 Brentwood Rd (South) to A128 Brentwood Rd (North)	1396	265	11.8	1431	274	11.7	1430	189	16.9
4-->2	A128 Brentwood Rd (South) to A13 EB mainline	2010	274	16.4	2056	292	15.8	2057	222	20.8
4-->3	A128 Brentwood Rd (South) to A1013 Stanford Rd (East)	1307	268	10.9	1330	287	10.4	1330	213	14.0
4-->5	A128 Brentwood Rd (South) to A1013 Stanford Rd (West)	856	230	8.3	862	222	8.7	864	132	14.6
4-->6	A128 Brentwood Rd (South) to A13 WB mainline	2351	273	19.3	2353	283	18.6	2364	178	29.7
4-->8	A128 Brentwood Rd (South) to A13 WB off-slip to A1089	2489	285	19.5	1768	262	15.1	2400	180	29.8
5-->1	A1013 Stanford Rd (West) to A128 Brentwood Rd (North)	1453	133	24.4	1465	272	12.1	1474	259	12.7
5-->2	A1013 Stanford Rd (West) to A13 EB mainline	2066	143	32.4	2090	289	16.2	2101	291	16.1
5-->3	A1013 Stanford Rd (West) to A1013 Stanford Rd (East)	1363	136	22.5	1364	285	10.7	1375	282	10.9
5-->4	A1013 Stanford Rd (West) to A128 Brentwood Rd (South)	1323	123	24.0	1315	273	10.8	1326	272	10.9
5-->6	A1013 Stanford Rd (West) to A13 WB mainline	2407	141	38.2	2387	280	19.0	2409	248	21.7
5-->8	A1013 Stanford Rd (West) to A13 WB off-slip to A1089	2545	153	37.1	1802	259	15.5	2445	250	21.9
6-->1	A13 EB mainline to A128 Brentwood Rd (North)	2767	160	38.8	2770	154	40.3	2775	152	40.7
6-->2	A13 EB mainline to A13 EB mainline	3345	121	61.8	3347	122	61.6	3347	126	59.5
6-->3	A13 EB mainline to A1013 Stanford Rd (East)	2678	162	37.0	2669	167	35.8	2676	176	34.1
6-->4	A13 EB mainline to A128 Brentwood Rd (South)	2637	150	39.4	2621	155	37.7	2627	166	35.4
6-->5	A13 EB mainline to A1013 Stanford Rd (West)	2852	169	37.8	2807	174	36.0	2815	190	33.1
6-->8	A13 EB mainline to A13 WB off-slip to A1089	4485	224	44.8	3713	215	38.7	4351	238	40.8

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4.3.5 The journey time comparison between the 2030 DM scenario and the 2016 Base Year for the 08:00 – 09:00 period shows the following:

- Journey times in the DM are generally similar to the base year across the majority of the routes, except for those routes originating from the A1013 (W) where journey times increase on average by 138s due to the delays on the approach.
- Journey times for those routes originating from the A1013 (E) on average decrease by 54s as the traffic signals at the A13 (E) approach assists with creating gaps in opposing traffic that contributes to the decrease in journey times.

4.3.6 The journey time comparison between the 2030 DS and 2030 DM scenarios for the 08:00 – 09:00 period shows the following:

- Journey times in the DS scenario are generally higher than the DM scenario across the majority of the routes, except for those routes originating from the A128 (S) and the A1013 (W) where journey times decrease in the DS scenario.
- The journey times originating from A128 (S) decrease on average by 84s as the introduction of traffic signals controlling the traffic contributes to the reduction in journey times.
- Journey time from the A13 (E) to the A1089 increases more than the journey times from the A13 (E) to other destinations, as traffic travelling from the A13 (E) to the A1089 are required to travel through the Orsett Cock junction in the DS scenario.
- Journey times in the DS scenario on the A13 mainline are similar to the DM scenario in both directions.

Table 4.6 Journey Time Comparison PM 17:00 – 18:00

Route	Name	2016 Base			2030 DM			2030 DS		
		Distance [m]	JT [s]	Speed [mph]	Distance [m]	JT [s]	Speed [mph]	Distance [m]	JT [s]	Speed [mph]
1-->2	A128 Brentwood Rd (North) to A13 EB mainline	2084	153	30.5	2122	134	35.5	2122	286	16.6
1-->3	A128 Brentwood Rd (North) to A1013 Stanford Rd (East)	1381	145	21.3	1396	131	23.9	1396	271	11.5
1-->4	A128 Brentwood Rd (North) to A128 Brentwood Rd (South)	1341	130	23.0	1347	116	26.1	1347	258	11.7
1-->5	A128 Brentwood Rd (North) to A1013 Stanford Rd (West)	1555	147	23.7	1533	134	25.5	1535	282	12.2
1-->6	A128 Brentwood Rd (North) to A13 WB mainline	3051	190	36.0	3025	185	36.6	3036	322	21.1
1-->8	A128 Brentwood Rd (North) to A13 WB off-slip to A1089	3189	202	35.2	2439	164	33.3	3071	326	21.1
2-->1	A13 WB mainline to A128 Brentwood Rd (North)	2343	188	27.9	2360	161	32.8	2359	491	10.8
2-->3	A13 WB mainline to A1013 Stanford Rd (East)	1628	150	24.2	1653	103	35.8	1653	413	9.0
2-->4	A13 WB mainline to A128 Brentwood Rd (South)	1588	136	26.2	1605	88	40.7	1605	400	9.0
2-->5	A13 WB mainline to A1013 Stanford Rd (West)	1803	152	26.6	1791	107	37.5	1793	424	9.5
2-->6	A13 WB mainline to A13 WB mainline	3177	113	62.8	3177	114	62.5	3178	118	60.5
2-->8	A13 WB mainline to A13 WB off-slip to A1089	3315	126	59.0	3315	127	58.6	3329	468	15.9
3-->1	A1013 Stanford Rd (East) to A128 Brentwood Rd (North)	1563	122	28.6	1590	139	25.6	1589	178	19.9
3-->2	A1013 Stanford Rd (East) to A13 EB mainline	2176	136	35.8	2215	163	30.3	2215	225	22.0
3-->4	A1013 Stanford Rd (East) to A128 Brentwood Rd (South)	807	70	25.8	835	66	28.2	835	88	21.3
3-->5	A1013 Stanford Rd (East) to A1013 Stanford Rd (West)	1022	86	26.6	1021	85	26.9	1023	111	20.5
3-->6	A1013 Stanford Rd (East) to A13 WB mainline	2517	129	43.6	2513	135	41.5	2523	152	37.1
3-->8	A1013 Stanford Rd (East) to A13 WB off-slip to A1089	2655	142	41.9	1927	114	37.6	2559	156	36.7
4-->1	A128 Brentwood Rd (South) to A128 Brentwood Rd (North)	1397	98	31.9	1431	136	23.6	1430	163	19.6
4-->2	A128 Brentwood Rd (South) to A13 EB mainline	2010	112	40.3	2056	160	28.7	2057	210	21.9
4-->3	A128 Brentwood Rd (South) to A1013 Stanford Rd (East)	1307	104	28.1	1330	157	18.9	1330	195	15.3
4-->5	A128 Brentwood Rd (South) to A1013 Stanford Rd (West)	856	62	31.1	862	82	23.6	864	96	20.1
4-->6	A128 Brentwood Rd (South) to A13 WB mainline	2351	105	50.2	2354	132	39.8	2365	137	38.7
4-->8	A128 Brentwood Rd (South) to A13 WB off-slip to A1089	2489	117	47.4	1768	111	35.5	2400	140	38.2
5-->1	A1013 Stanford Rd (West) to A128 Brentwood Rd (North)	1452	118	27.4	1465	130	25.2	1474	145	22.8
5-->2	A1013 Stanford Rd (West) to A13 EB mainline	2065	132	34.9	2090	155	30.2	2101	191	24.6
5-->3	A1013 Stanford Rd (West) to A1013 Stanford Rd (East)	1362	125	24.4	1364	152	20.1	1375	176	17.5
5-->4	A1013 Stanford Rd (West) to A128 Brentwood Rd (South)	1321	110	26.9	1315	136	21.6	1326	164	18.1
5-->6	A1013 Stanford Rd (West) to A13 WB mainline	2406	125	42.9	2387	127	42.1	2409	118	45.6
5-->8	A1013 Stanford Rd (West) to A13 WB off-slip to A1089	2544	138	41.2	1802	106	38.1	2445	122	44.8
6-->1	A13 EB mainline to A128 Brentwood Rd (North)	2768	374	16.6	2770	149	41.5	2775	228	27.3
6-->2	A13 EB mainline to A13 EB mainline	3345	267	28.1	3347	124	60.5	3347	149	50.3
6-->3	A13 EB mainline to A1013 Stanford Rd (East)	2678	380	15.8	2669	171	35.0	2676	259	23.1
6-->4	A13 EB mainline to A128 Brentwood Rd (South)	2637	365	16.2	2621	155	37.7	2627	247	23.8
6-->5	A13 EB mainline to A1013 Stanford Rd (West)	2852	381	16.7	2807	174	36.1	2815	271	23.3
6-->8	A13 EB mainline to A13 WB off-slip to A1089	4485	437	23.0	3713	204	40.8	4351	315	30.9

4.3.7 The journey time comparison between the 2030 DM scenario and 2016 Base Year for the 17:00 – 18:00 period shows the following:

- Journey times in the DM scenario are generally lower than the base year across the majority of the routes, except for those routes originating from the A128 (S) where journey times increase on average by 30s.
- Journey times for routes originating from the A13 (W) eastbound reduce significantly by over 200s due to widening of the A13 mainline in the DM scenario.

4.3.8 The journey time comparison between the 2030 DS and 2030 DM scenarios for the 17:00 – 18:00 period shows the following:

- Journey times in the DS scenario are higher than the DM scenario across all routes due to the congestion at the Orsett Cock junction.

- Journey times of routes originating from the A13 (E) and the A128 (N) increase the most due to the delay on the approach to the junction. Journey times from the A13 (E) increase by over 300s and the journey times from the A128 (N) increase by 147s on average.

4.4 Relative Delays

4.4.1 The relative delay in VISSIM is the total segment delay divided by the total segment travel time on a link, with the link made up of 10m length segments.

4.4.2 The relative delay plots on all links in the network are shown in Plate 4.2 to Plate 4.7. They provide a visual representation of the delays at the junctions and along the mainline.

Plate 4.2 Relative Delay Plot (2030 DM 07:00 – 08:00)

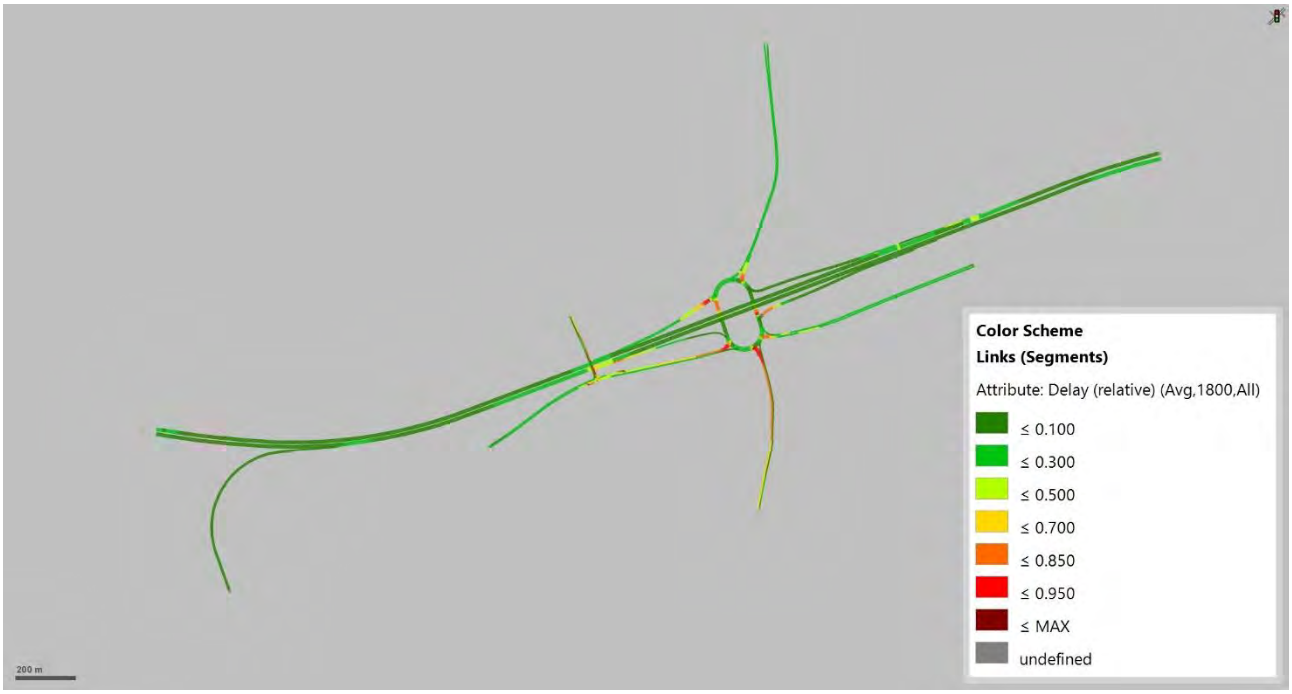

Plate 4.3 Relative Delay Plot (2030 DS 07:00 – 08:00)

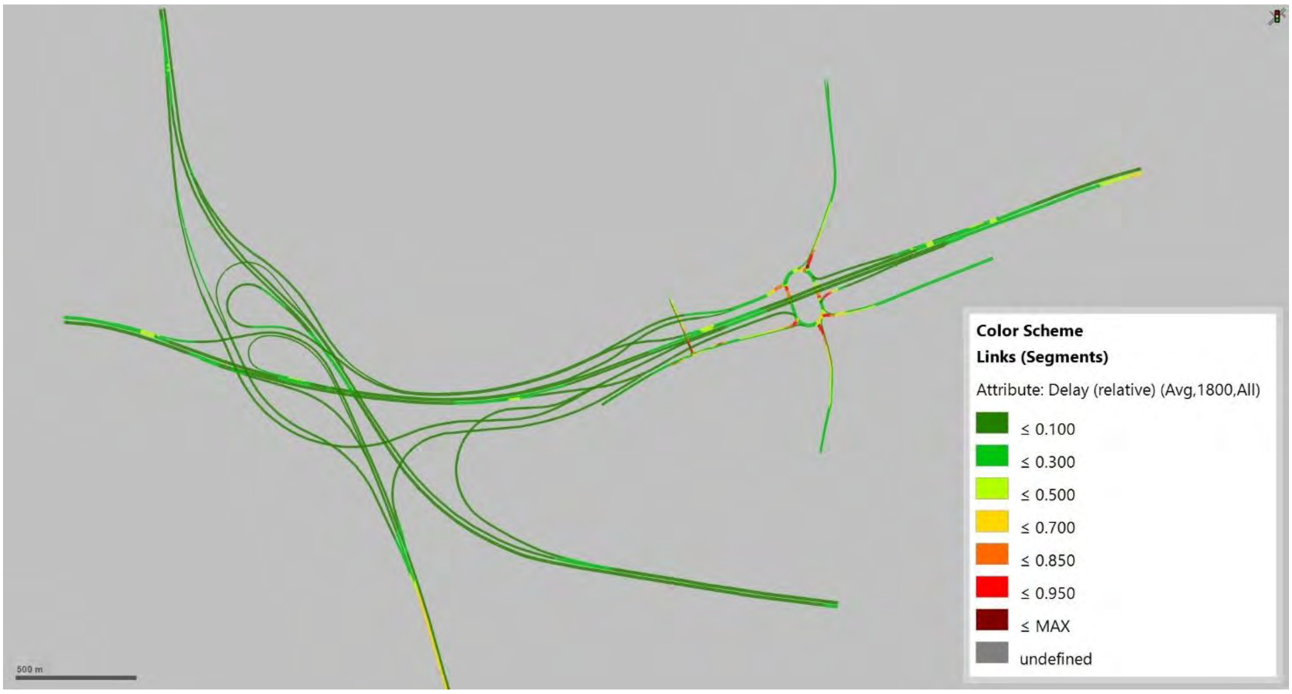

Plate 4.4 Relative Delay Plot (2030 DM 08:00 – 09:00)

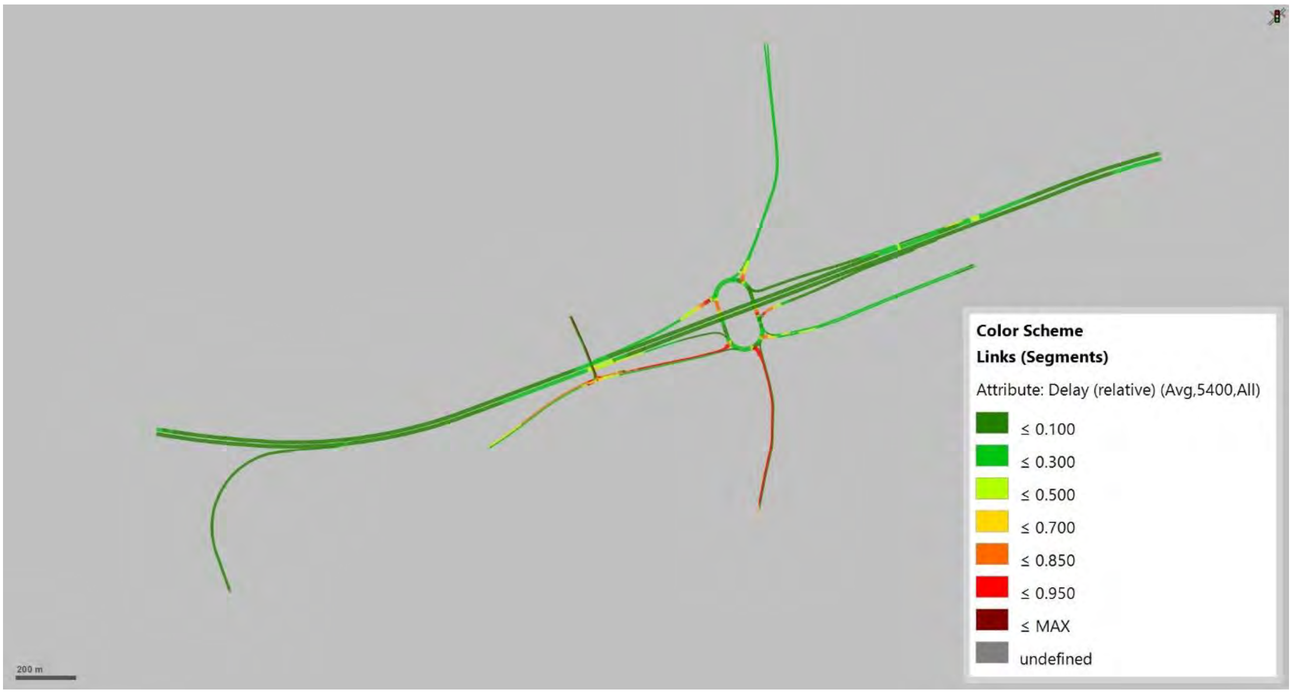

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Plate 4.5 Relative Delay Plot (2030 DS 08:00 – 09:00)

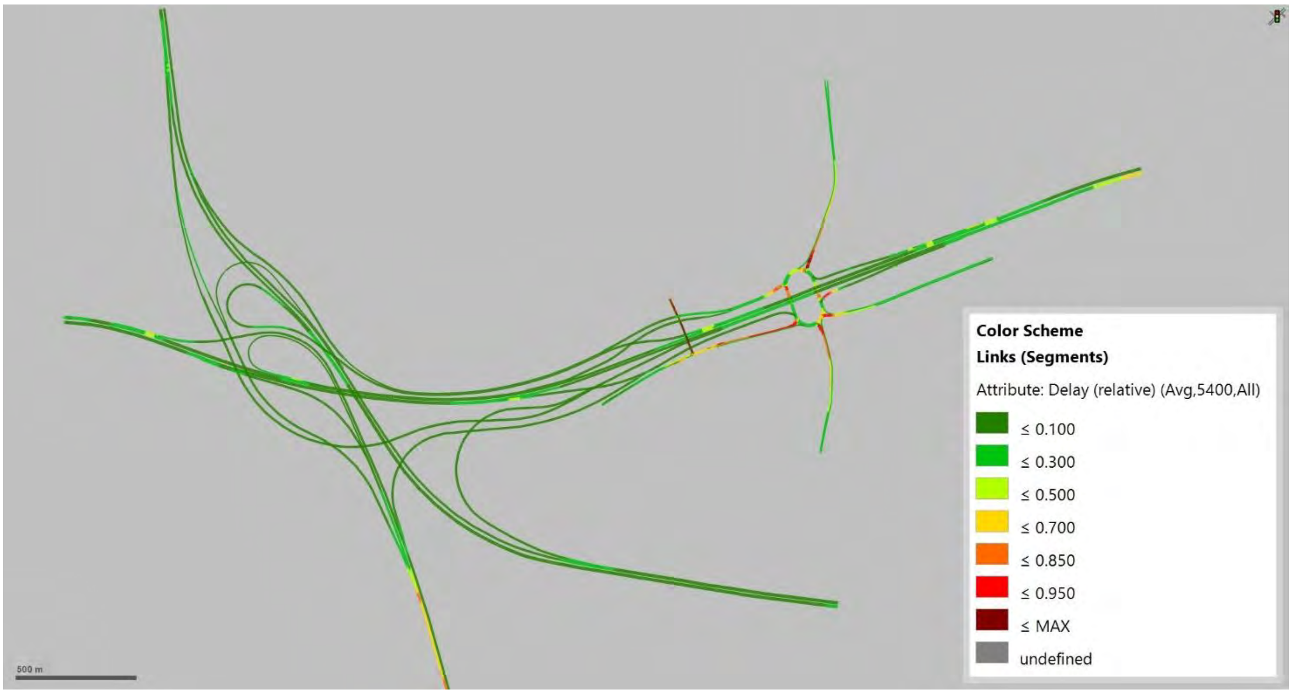


Plate 4.6 Relative Delay Plot (2030 DM 17:00 – 18:00)

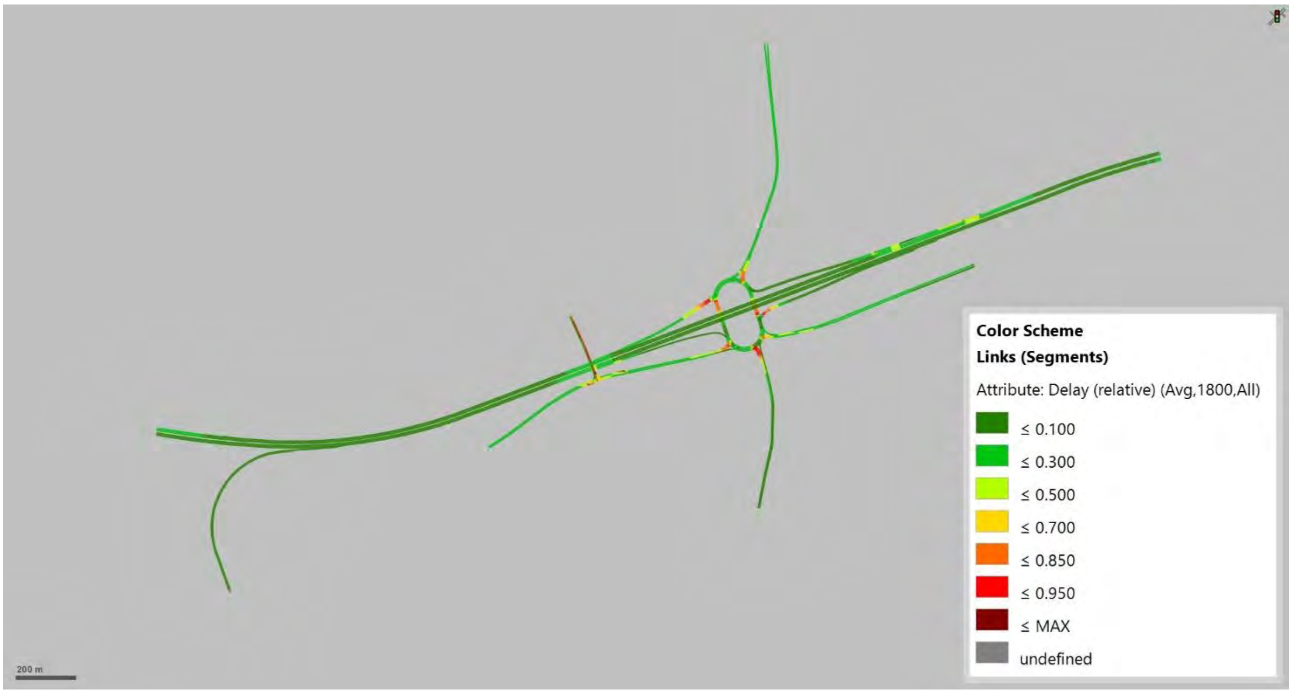
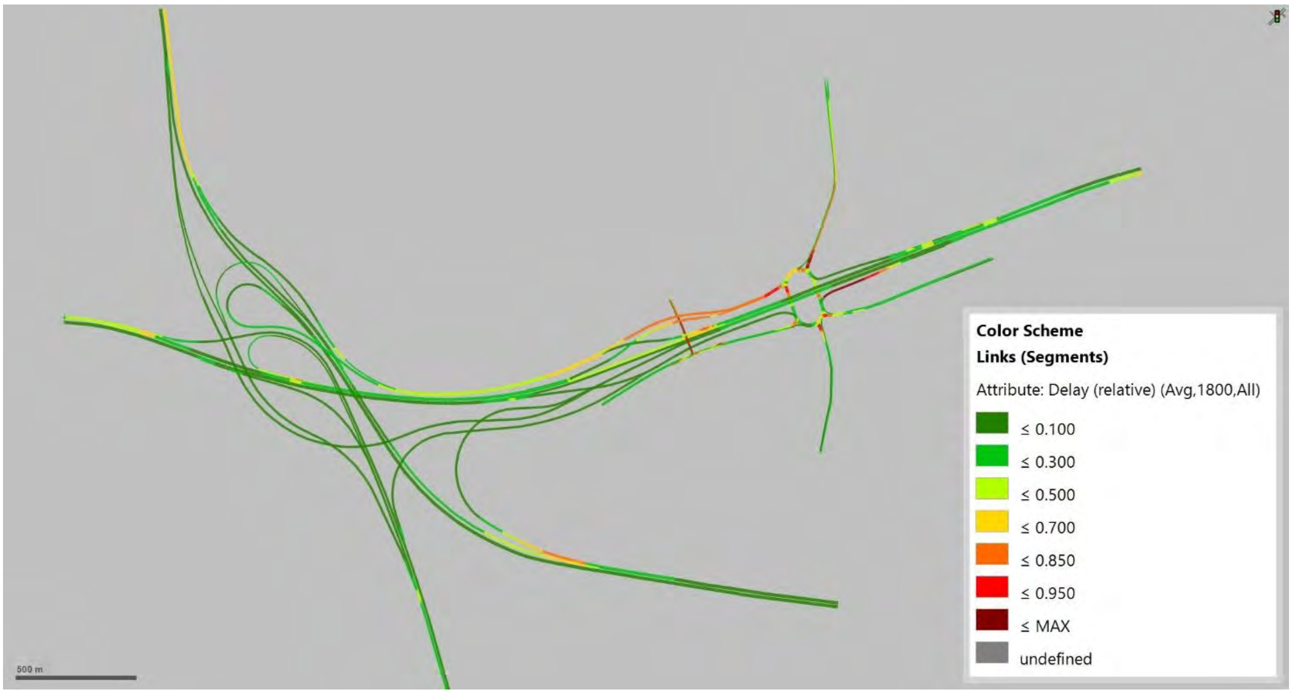


Plate 4.7 Relative Delay Plot (2030 DS 17:00 – 18:00)



4.4.3 In addition to the delays at the Orsett Cock and the A1013 Stanford Road/ Rectory Road junctions, which have been described in the previous sections, the plots also show that the traffic conditions of the A13 mainline are free-flowing in all peak periods.

4.4.4 Plate 4.3 and Plate 4.5 show that the 2030 DS scenario has some minor delays on the A1089 northbound before the diverge to LTC in the AM peak.

4.4.5 Plate 4.7 additionally shows some minor delays on the LTC southbound before the diverge to the Orsett Cock junction and at the southbound merge with the A13 mainline.

5. Conclusion

5.1.1 This report describes the development of the 2030 Do Minimum (DM) and the 2030 Do Something (DS) VISSIM models of the Orsett Cock study area that includes the Orsett Cock junction. It also compares the results between the two models.

5.1.2 The DS model contains initial ideas on changes to improve conditions at the junction. Further improvements will be developed through discussions with Thurrock Council.

5.1.3 The analysis of the traffic conditions at the Orsett Cock junction shows that the A128 (S) and the A1013 (W) approaches are predicted to be over-saturated in 2030 DM scenario (without LTC). The traffic conditions on these approaches improve slightly in 2030 DS scenario (with LTC),

5.1.4 Overall delays and queueing increase at the junction with the implementation of LTC in 2030, particularly in the PM peak period with an increase in delays and queues in the 2030 DS scenario on the A13 (W), A128 (S) and A13 (E) approaches.

5.1.5 Analysis of the traffic conditions at the A1013 Stanford Road/ Rectory Road junction shows that Rectory Road is over-saturated in the 2030 DM scenario and the delays and queues increase in the 2030 DS scenario due to the higher demand flow in the DS scenario and the removal of the right turn pocket on A1013 which reduces the gaps in traffic on the A1013 westbound for right turning vehicles from Rectory Road.

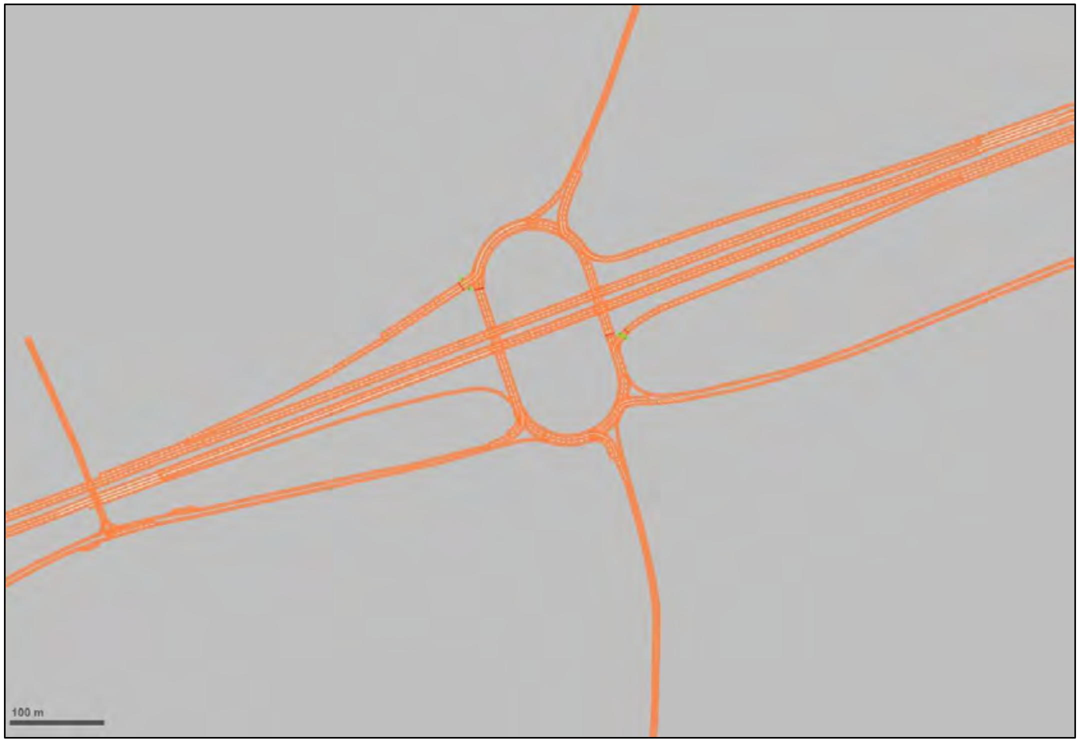
Orsett Cock VISSIM Model

Operational Assessment – 2030 & 2045 Preliminary Results

15 September 2022

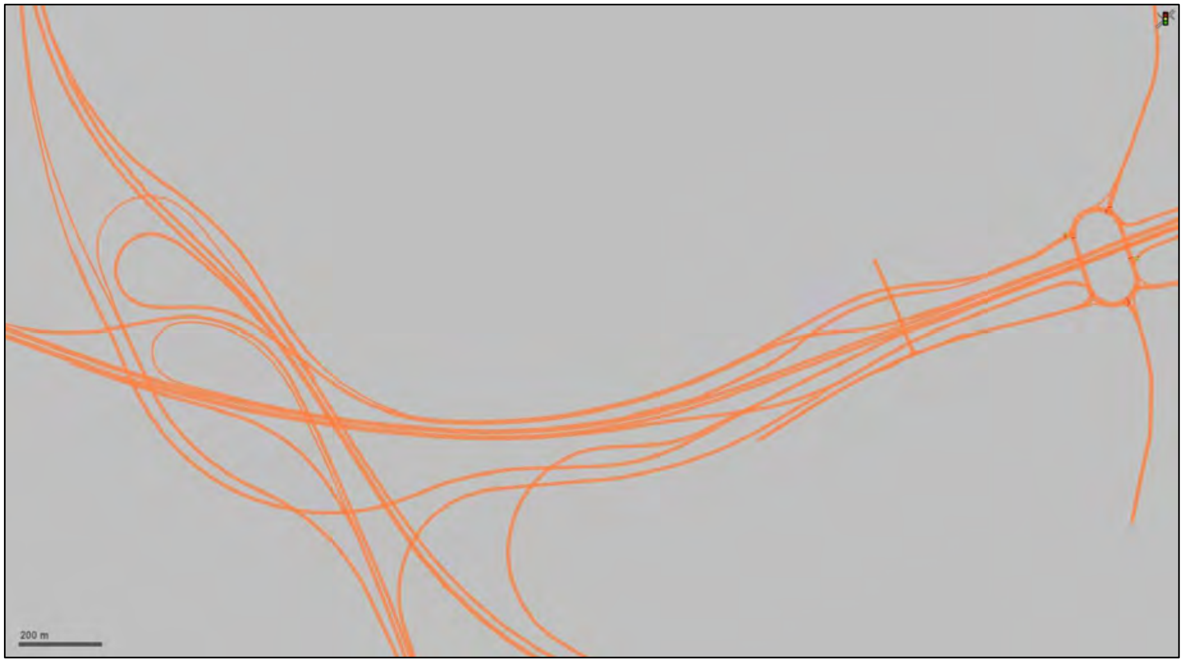
Summary of Scenarios – DM Network

- Introduction of an extra lane in both directions on the A13 east of Orsett Cock.
- Reconfiguration of the merges and diverges at the Orsett Cock junction with the A13 in both directions.
- Reconfiguration of the westbound on-slip to the A13 West with the slip road reduced to one lane.
- Reconfiguration of the A128 North approach with an extra flare lane.
- Reconfiguration of the A13 West approach (eastbound off-slip) with an extra flare lane.
- Introduction of an extra lane in the circulatory.
- Introduction of controlled pedestrian crossings and traffic signals on the A13 West and A13 East approaches.



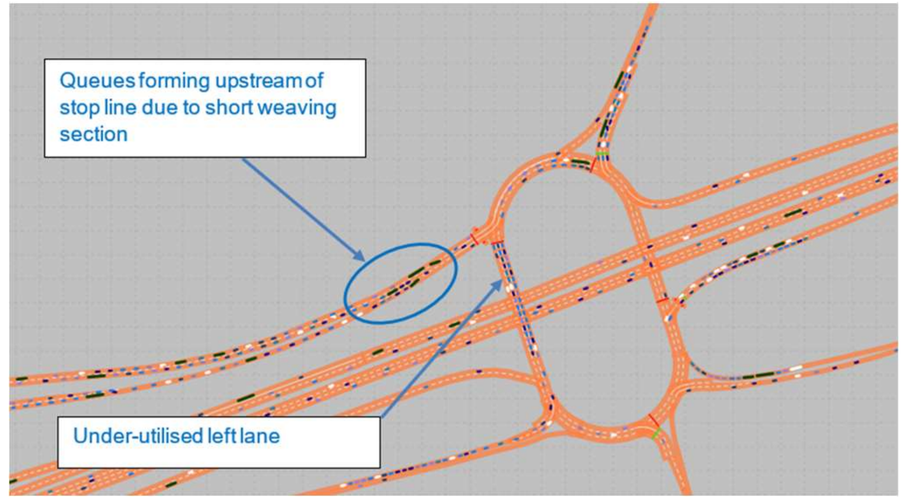
Summary of Scenarios – DS Network

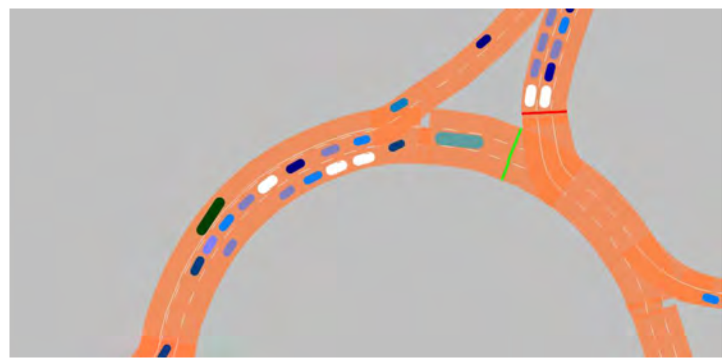
- Introduction of new LTC links around the A13/ A1089 interchange.
- Reconfiguration of A13/ A1089 interchange.
- Reconfiguration of slip roads on the A13 west of Orsett Cock.
- Realignment of A1013 (West) Stanford Road.
- Introduction of traffic signals on the A128 North and A128 South approaches at Orsett Cock.
- Reconfiguration of the A1013/ Rectory Road junction.



Initial Visual Observations

- DS models indicated that the traffic behaviour upstream of the traffic signals at the A13 West approach and the circulatory, were impacting the efficiency of these traffic signals.
- A large number of vehicles from LTC need to be in the middle and right-hand lanes, while a lot of traffic from the A13 need to use the middle and left-hand lanes for the A128 (N) exit. This causes a bottleneck upstream of the stop line, impacting the efficiency of these traffic signals with queues extending to the A13 mainline.
- The volume of traffic travelling from the circulatory to the A128 (N) is relatively low in comparison to other movements, resulting in the left lane being under-utilized.
- Traffic travelling from the right-hand lane on the western over bridge need to change to the middle lane for the A13 (E) exit. This causes delays upstream of the stop line.





Lower Thames Crossing

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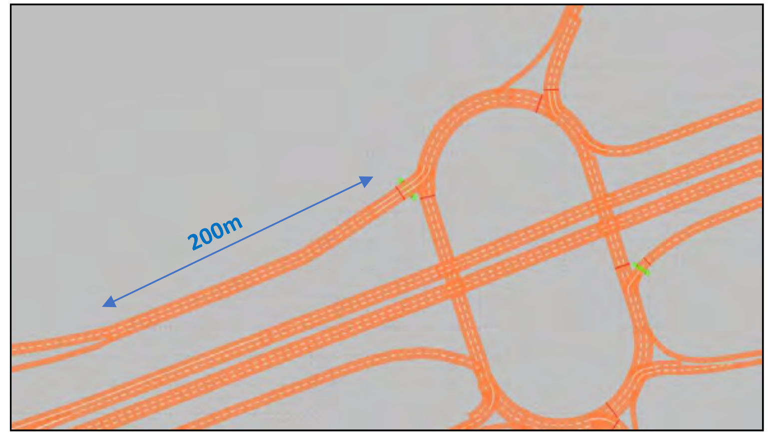
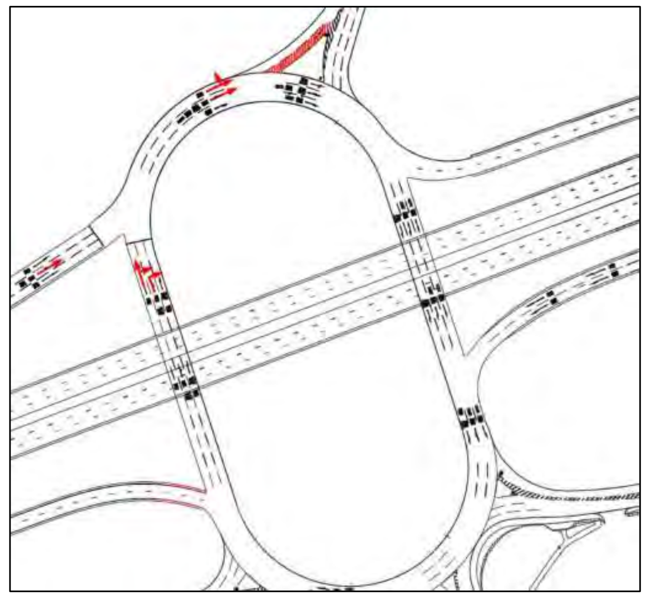
Provisional Improvements for DS

- Increased the modelled length of the section where traffic from LTC and the A13 merges on the A13 West approach, from 90m to 200m.
- Modified Lane Markings at A128 (N) exit to achieve a more even spread in lane usage on the western overbridge and avoid traffic changing lanes in the northern circulatory for the A13 (E) exit.
- The westbound on-slip on the A13 West exit is one lane in the DM network. This has been modified to two lanes in the DS network so as to tie in with the LTC design which has two lanes on the slip road.





Lower Thames Crossing

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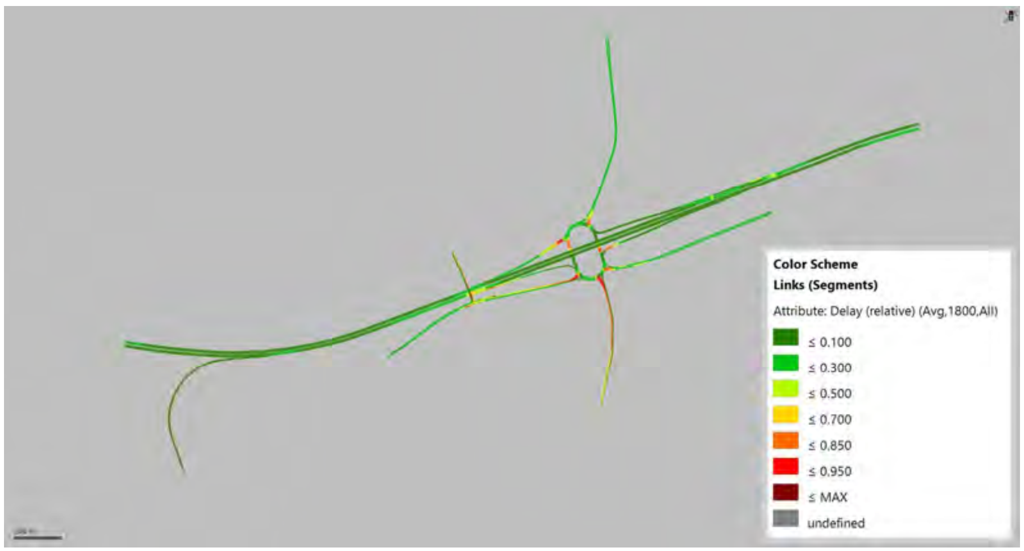
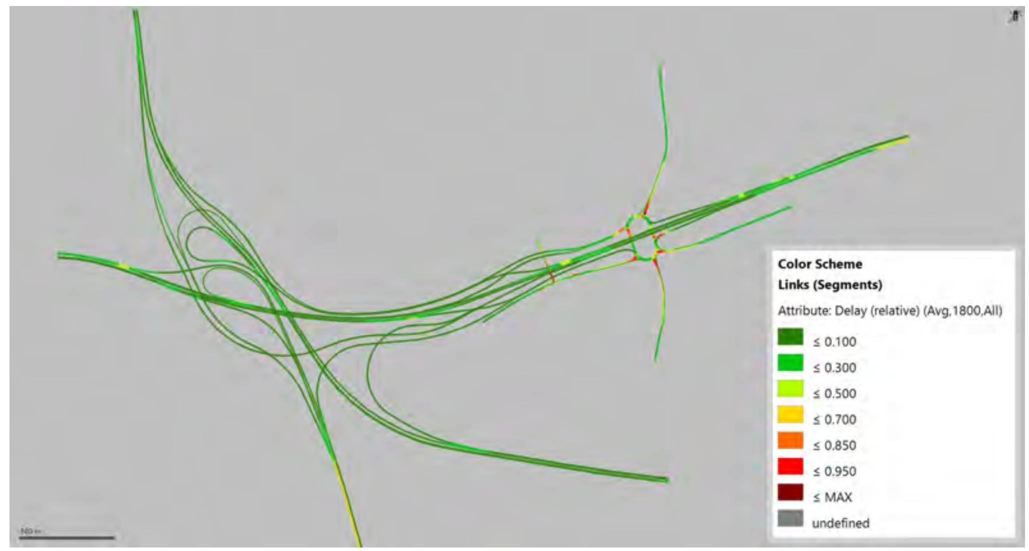
Delay Plots 2030 7.00 – 8.00

- DM



- DS



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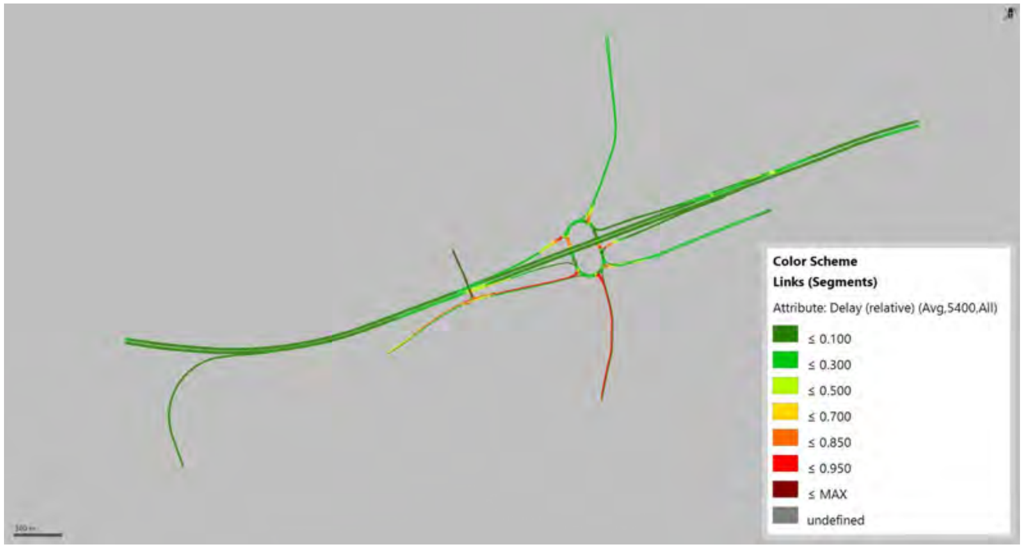
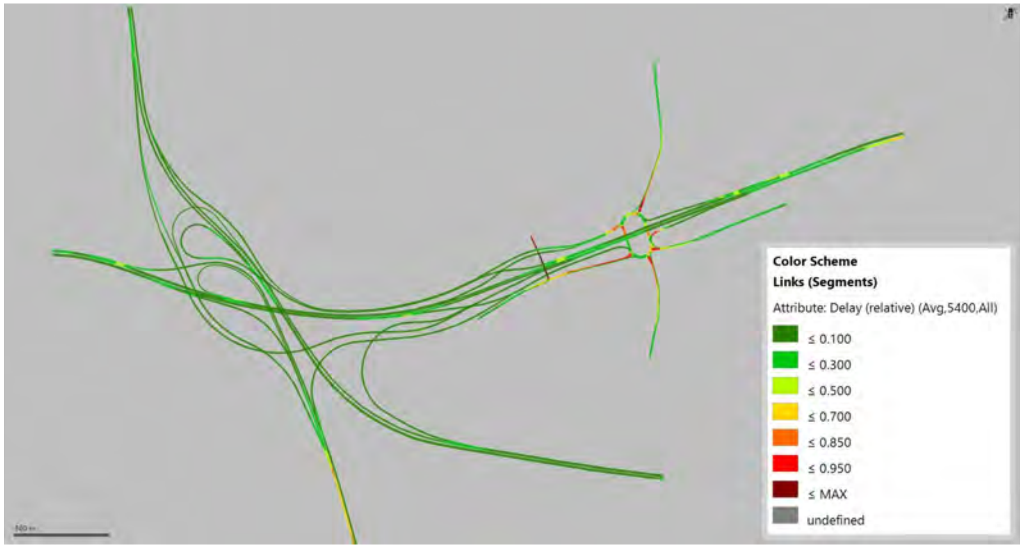
Delay Plots 2030 8.00 – 9.00

- DM



- DS



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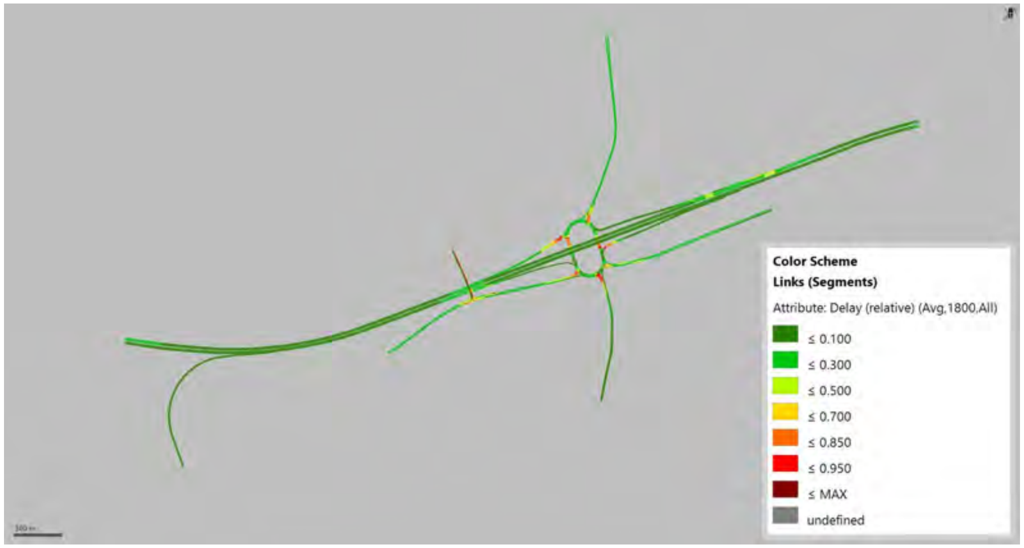
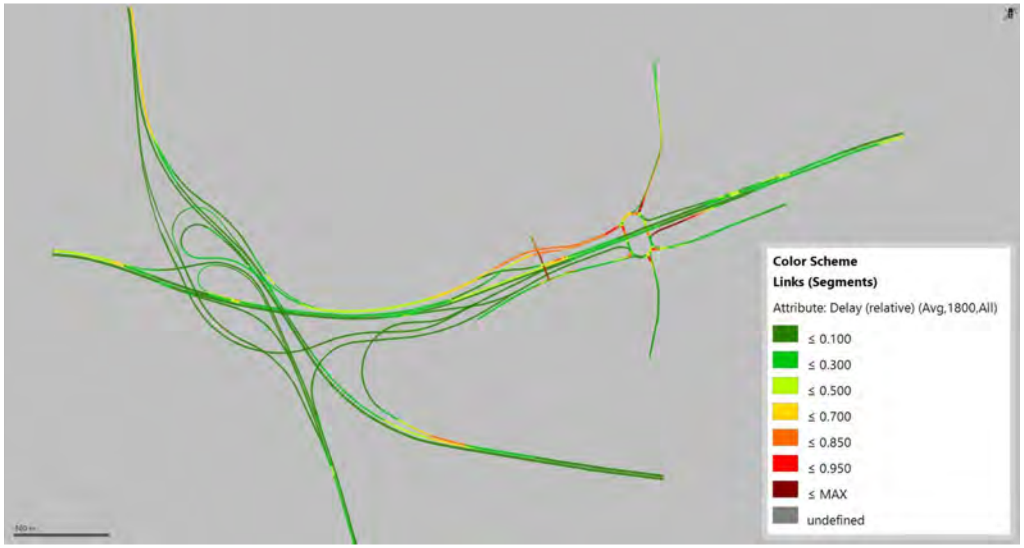
Delay Plots 2030 17.00 – 18.00

- DM



- DS



Lower Thames Crossing

national highways

Traffic Condition Analysis (2030)

- Average delays* and queues in AM Peak

* It is the average of all delays originating from the approach along all possible routes

AM peak 7.00 - 8.00									
Junction	Approach	Avg. Delay per veh [s]			Diff [s]	Mean Max. Queue [m]			Diff [m]
		2016 Base	2030 DM	2030 DS		2016 Base	2030 DM	2030 DS	
Orsett Cock	A128 Brentwood Rd (North)	13	22	86	65	37	25	120	94
	A13 (East)	2	4	36	32	37	59	54	-5
	A1013 Stanford Rd (East)	47	18	48	31	114	33	75	42
	A128 Brentwood Rd (South)	40	73	74	1	55	226	136	-90
	A1013 Stanford Rd (West)	46	63	70	7	97	174	84	-89
	A13 (West)	10	3	7	4	93	38	62	24
A1013 Stanford Road / Rectory Road	Rectory Rd	9	23	52	30	13	56	65	9
	Stanford Rd (East)	6	5	8	2	10	13	41	27
	Stanford Rd (West)	3	3	3	0	-	-	-	

AM peak 8.00 - 9.00									
Junction	Approach	Avg. Delay per veh [s]			Diff [s]	Mean Max. Queue [m]			Diff [m]
		2016 Base	2030 DM	2030 DS		2016 Base	2030 DM	2030 DS	
Orsett Cock	A128 Brentwood Rd (North)	23	24	144	120	51	31	285	254
	A13 (East)	6	4	37	33	47	56	55	-1
	A1013 Stanford Rd (East)	94	17	59	42	153	31	71	40
	A128 Brentwood Rd (South)	207	93	93	0	127	506	173	-333
	A1013 Stanford Rd (West)	59	104	174	71	109	473	387	-86
	A13 (West)	11	3	8	5	85	38	67	29
A1013 Stanford Road / Rectory Road	Rectory Rd	11	74	301	228	16	223	244	21
	Stanford Rd (East)	8	7	10	3	13	31	58	27
	Stanford Rd (West)	3	39	13	-26	-	-	-	

Lower Thames Crossing

national highways

Traffic Condition Analysis (2030)

- Average delays* and queues in PM Peak

PM peak 17.00 - 18.00									
Junction	Approach	Avg. Delay per veh [s]			Diff [s]	Mean Max. Queue [m]			Diff [m]
		2016 Base	2030 DM	2030 DS		2016 Base	2030 DM	2030 DS	
Orsett Cock	A128 Brentwood Rd (North)	51	26	156	130	88	36	383	347
	A13 (East)	10	3	295	292	87	47	222	176
	A1013 Stanford Rd (East)	22	15	42	28	34	19	40	22
	A128 Brentwood Rd (South)	13	39	57	17	19	37	43	5
	A1013 Stanford Rd (West)	30	42	64	22	135	71	46	-25
	A13 (West)	29	3	25	21	467	37	673	636
A1013 Stanford Road / Rectory Road	Rectory Rd	21	32	154	122	34	142	148	6
	Stanford Rd (East)	6	6	13	6	10	22	73	52
	Stanford Rd (West)	4	3	5	2	-	-	-	

* It is the average of all delays originating from the approach along all possible routes

Lower Thames Crossing

national highways

Traffic Condition Analysis (2030)

- Journey Times AM 7.00 – 8.00

Peak	Route	DM [s]	DS [s]	Diff [s]
AM 07:00-08:00	1-->2	123	189	66
	1-->3	118	182	64
	1-->4	107	172	65
	1-->5	125	195	70
	1-->6	196	242	46
	1-->8	175	244	69
	2-->1	160	184	24
	2-->3	100	111	11
	2-->4	89	101	12
	2-->5	107	124	17
	2-->6	118	120	2
	2-->8	131	173	42
	3-->1	143	180	37
	3-->2	160	210	49
	3-->4	72	97	25
	3-->5	90	119	30
	3-->6	161	167	6
	3-->8	140	169	29
	4-->1	206	180	-26
	4-->2	223	209	-13
	4-->3	218	203	-15
	4-->5	152	119	-33
	4-->6	224	167	-57
	4-->8	203	169	-34
	5-->1	167	156	-11
	5-->2	184	185	1
	5-->3	179	179	0
	5-->4	168	169	1
	5-->6	185	143	-42
	5-->8	164	145	-19
	6-->1	153	150	-4
	6-->2	122	126	4
	6-->3	165	173	7
	6-->4	155	163	8
	6-->5	172	185	13
	6-->8	222	235	12

Lower Thames Crossing

national highways

Traffic Condition Analysis (2030)

- Journey Times AM 8.00 – 9.00

Peak	Route	DM [s]	DS [s]	Diff [s]
AM 08:00-09:00	1-->2	125	248	123
	1-->3	121	239	118
	1-->4	109	229	119
	1-->5	128	253	125
	1-->6	190	299	109
	1-->8	169	301	133
	2-->1	161	186	26
	2-->3	100	115	14
	2-->4	89	105	16
	2-->5	108	129	21
	2-->6	117	120	3
	2-->8	130	177	48
	3-->1	142	186	44
	3-->2	159	219	59
	3-->4	71	105	34
	3-->5	90	129	39
	3-->6	151	175	24
	3-->8	130	177	47
	4-->1	274	189	-85
	4-->2	292	222	-70
	4-->3	287	213	-75
	4-->5	222	132	-90
	4-->6	283	178	-105
	4-->8	262	180	-82
	5-->1	272	259	-13
	5-->2	289	291	3
	5-->3	285	282	-2
	5-->4	273	272	-1
	5-->6	280	248	-33
	5-->8	259	250	-9
	6-->1	154	152	-1
	6-->2	122	126	4
	6-->3	167	176	9
	6-->4	155	166	11
	6-->5	174	190	16
	6-->8	215	238	24

Lower Thames Crossing

national highways

Traffic Condition Analysis (2030)

- Journey Times PM 17.00 – 18.00

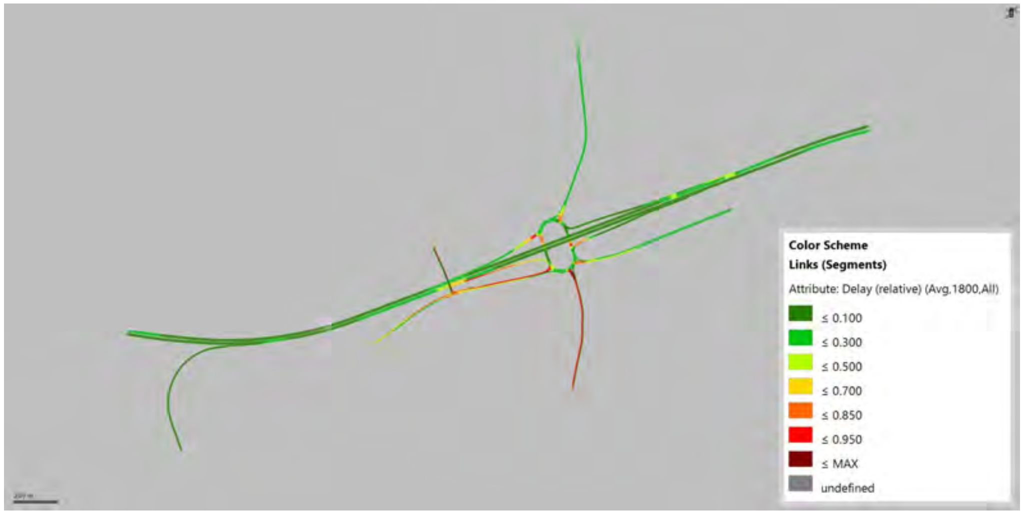
Peak	Route	DM [s]	DS [s]	Diff [s]
PM 17:00-18:00	1-->2	134	286	152
	1-->3	131	271	140
	1-->4	116	258	143
	1-->5	134	282	148
	1-->6	185	322	138
	1-->8	164	326	162
	2-->1	161	491	330
	2-->3	103	413	309
	2-->4	88	400	312
	2-->5	107	424	317
	2-->6	114	118	4
	2-->8	127	468	342
	3-->1	139	178	39
	3-->2	163	225	62
	3-->4	66	88	22
	3-->5	85	111	27
	3-->6	135	152	17
	3-->8	114	156	41
	4-->1	136	163	27
	4-->2	160	210	50
	4-->3	157	195	37
	4-->5	82	96	14
	4-->6	132	137	4
	4-->8	111	140	29
	5-->1	130	145	14
	5-->2	155	191	37
	5-->3	152	176	25
	5-->4	136	164	27
	5-->6	127	118	-9
	5-->8	106	122	16
	6-->1	149	228	79
	6-->2	124	149	25
	6-->3	171	259	89
	6-->4	155	247	92
	6-->5	174	271	97
	6-->8	204	315	111

Lower Thames Crossing

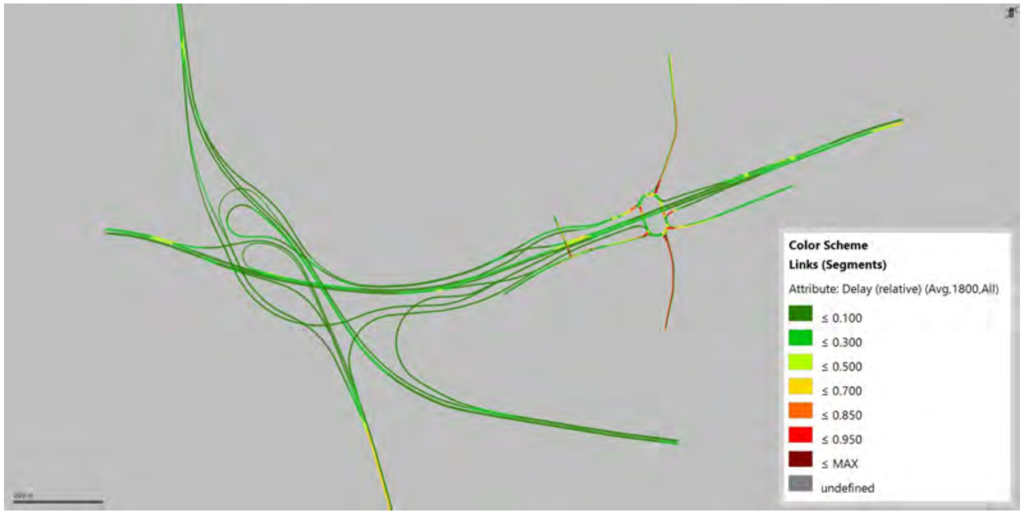
national highways

Delay Plots 2045 7.00 – 8.00

- DM



- DS

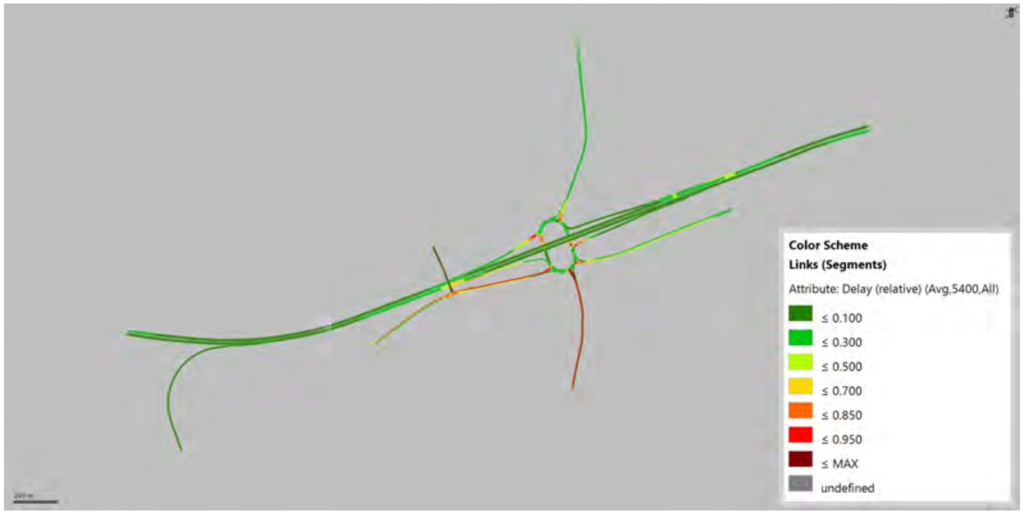


Lower Thames Crossing

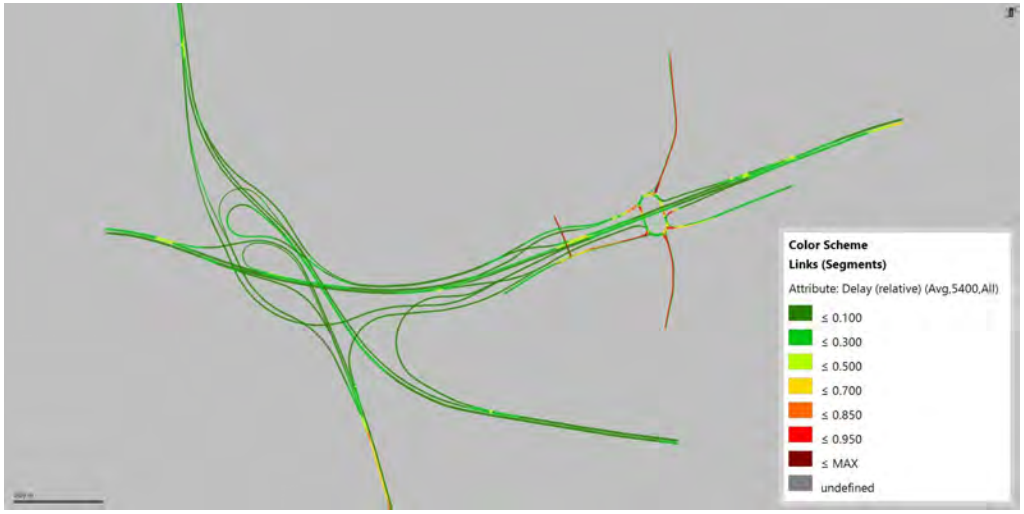
national highways

Delay Plots 2045 8.00 – 9.00

- DM



- DS

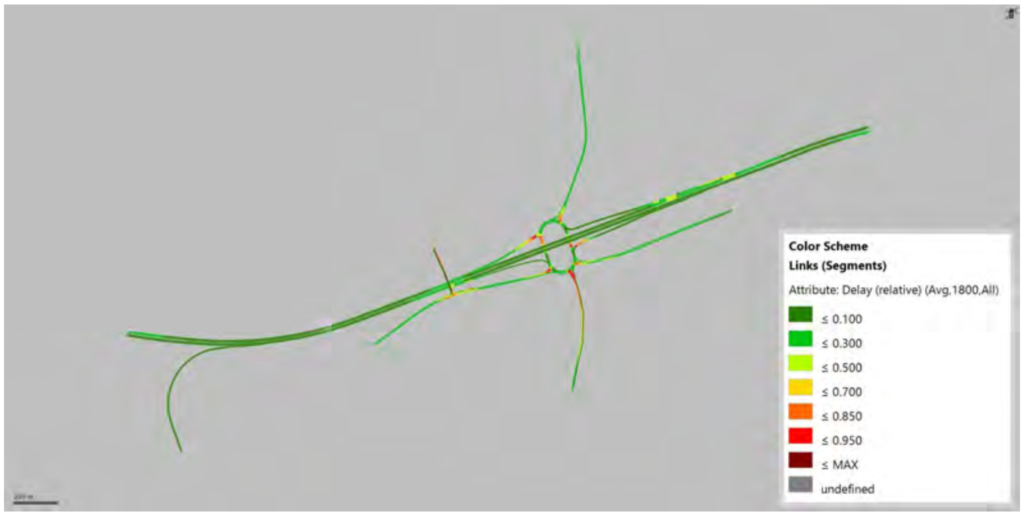


Lower Thames Crossing

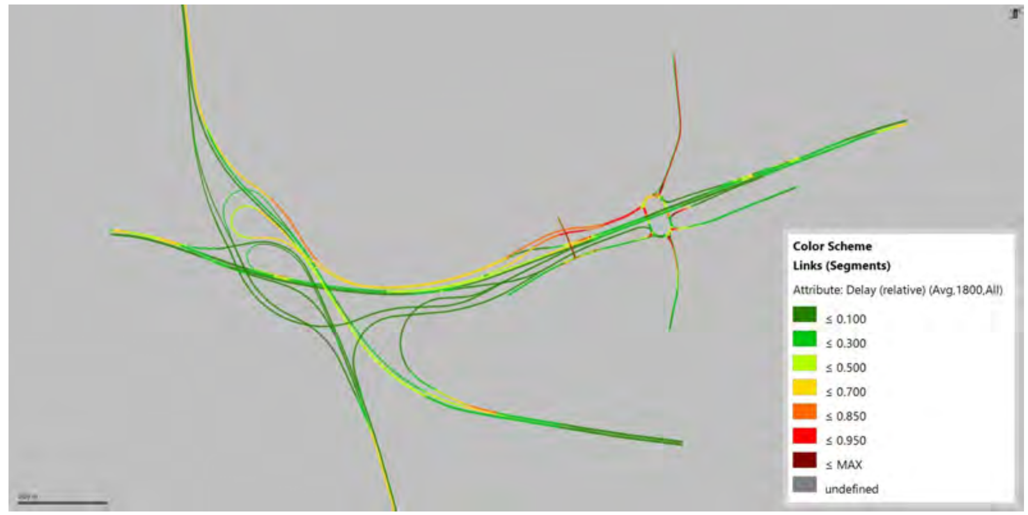
national highways

Delay Plots 2045 17.00 – 18.00

- DM



- DS



Lower Thames Crossing

national highways

Traffic Condition Analysis (2045)

- Average delays* and queues in AM Peak

* It is the average of all delays originating from the approach along all possible routes

AM peak 7.00 - 8.00

Junction	Approach	Avg. Delay per veh [s]			Diff [s]	Mean Max. Queue [m]			Diff [m]
		2016 Base	2045 DM	2045 DS		2016 Base	2045 DM	2045 DS	
Orsett Cock	A128 Brentwood Rd (North)	13	32	168	136	37	29	357	328
	A13 (East)	2	5	36	31	37	60	50	-11
	A1013 Stanford Rd (East)	47	42	58	16	114	79	91	12
	A128 Brentwood Rd (South)	40	269	236	-33	55	393	534	140
	A1013 Stanford Rd (West)	46	205	80	-126	97	631	93	-538
	A13 (West)	10	3	9	6	93	38	83	45
A1013 Stanford Road / Rectory Road	Rectory Rd	9	71	49	-23	13	132	60	-72
	Stanford Rd (East)	6	18	8	-10	10	96	40	-56
	Stanford Rd (West)	3	97	3	-94	-	-	-	

AM peak 8.00 - 9.00

Junction	Approach	Avg. Delay per veh [s]			Diff [s]	Mean Max. Queue [m]			Diff [m]
		2016 Base	2045 DM	2045 DS		2016 Base	2045 DM	2045 DS	
Orsett Cock	A128 Brentwood Rd (North)	23	36	279	243	51	47	794	748
	A13 (East)	6	6	36	31	47	61	51	-10
	A1013 Stanford Rd (East)	94	62	75	13	153	156	97	-58
	A128 Brentwood Rd (South)	207	430	202	-228	127	538	536	-1
	A1013 Stanford Rd (West)	59	184	175	-9	109	792	325	-467
	A13 (West)	11	4	10	7	85	39	90	51
A1013 Stanford Road / Rectory Road	Rectory Rd	11	120	270	149	16	223	233	11
	Stanford Rd (East)	8	20	9	-11	13	111	54	-57
	Stanford Rd (West)	3	114	12	-102	-	-	-	

Lower Thames Crossing

national highways

Traffic Condition Analysis (2045)

- Average delays* and queues in PM Peak

PM peak 17.00 - 18.00										
Junction	Approach	Avg. Delay per veh [s]			Diff [s]	Mean Max. Queue [m]			Diff [m]
		2016 Base	2045 DM	2045 DS		2016 Base	2045 DM	2045 DS	
Orsett Cock	A128 Brentwood Rd (North)	51	28	274	246	88	38	768	730
	A13 (East)	10	4	74	70	87	56	96	40
	A1013 Stanford Rd (East)	22	24	44	20	34	28	46	17
	A128 Brentwood Rd (South)	13	107	122	14	19	150	160	10
	A1013 Stanford Rd (West)	30	45	78	32	135	70	58	-11
	A13 (West)	29	3	34	31	467	37	1276	1239
A1013 Stanford Road / Rectory Road	Rectory Rd	21	45	180	135	34	169	165	-3
	Stanford Rd (East)	6	12	15	3	10	49	95	46
	Stanford Rd (West)	4	7	5	-1	-	-	-	

* It is the average of all delays originating from the approach along all possible routes

Lower Thames Crossing

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Latent Demand (no. vehicles)

- No. of vehicles unable to enter the model network during the simulation period due to queues blocking back to the edge of the network

	AM 7-8	AM 8-9	PM 17-18
Base	31	2	59
2030 DM	68	208	2
2030 DS	376	523	669
2045 DM	336	801	48
2045 DS	896	1529	1527

Lower Thames Crossing

national highways

Appendix C

Orsett Cock Traffic Flows

Survey Date 30/11/22

A	**A128**
B	**A13 (E)**
C	**A1013 (SE)**
D	**BRENTWOOD ROAD**
E	**A1013 (SW)**
F	**A13 (W)**

Surveys show 0800-0900 and 1700-1800 for consistency with LTM.
note actual peak is 0730-0830 and 1630-1730

0700-0800 ALL VEHICLES

	A	B	C	D	E	F	Total
A	0	78	106	47	55	188	474
B	152	3	8	129	325	3	620
C	64	2	0	28	140	274	508
D	198	191	29	0	59	108	585
E	184	301	21	13	3	27	549
F	321	0	99	77	20	0	517
Total	919	575	263	294	602	600	3253

HGV

	A	B	C	D	E	F	Total
A	0	12	5	0	5	27	49
B	54	1	0	4	5	0	64
C	9	0	0	5	12	28	54
D	8	6	2	0	1	1	18
E	13	10	8	1	2	8	42
F	75	0	15	2	6	0	98
Total	159	29	30	12	31	64	325

0800-0900 ALL VEHICLES

	A	B	C	D	E	F	Total
A	0	87	94	56	143	179	559
B	89	1	12	138	504	1	745
C	44	1	0	60	177	268	550
D	181	202	29	0	104	100	616
E	121	380	93	51	0	31	676
F	255	0	138	66	18	7	484
Total	690	671	366	371	946	586	3630

HGV

	A	B	C	D	E	F	Total
A	0	18	4	2	5	29	58
B	20	0	1	2	21	0	44
C	2	0	0	4	12	23	41
D	7	7	1	0	5	0	20
E	3	8	7	3	0	10	31
F	53	0	9	0	6	6	74
Total	85	33	22	11	49	68	268

1700-1800 ALL VEHICLES PM

	A	B	C	D	E	F	Total
A	1	103	96	135	135	220	690
B	67	2	21	185	338	0	613
C	19	1	0	51	114	205	390
D	42	288	16	0	39	66	451
E	183	262	106	67	0	23	641
F	282	0	356	119	17	1	775
Total	594	656	595	557	643	515	3560

HGV

	A	B	C	D	E	F	Total
A	1	13	5	2	0	8	29
B	10	0	0	1	0	0	11
C	0	0	0	2	5	3	10
D	0	1	0	0	0	0	1
E	0	0	5	0	0	1	6
F	15	0	5	0	2	0	22
Total	26	14	15	5	7	12	79

LDO Forecasts

0700-0800 ALL VEHICLES

	2016	2030 DM	2030DS	Change
A	632	712	683	-29
B	676	942	760	-182
C	655	659	685	26
D	602	717	722	5
E	599	793	643	-150
F	497	479	1431	952
Total	3661	4302	4924	622
				14%

Vehicles

0700-0800 2030 DS

	A	B	C	D	E	F	Total
A	0	117	159	71	83	282	712
B	231	5	12	196	494	5	942
C	83	3	0	36	182	355	659
D	243	234	36	0	72	132	717
E	266	435	30	19	4	39	793
F	297	0	92	71	19	0	479
Total	1120	793	329	393	853	814	4302

Vehicles

2030 DS

	A	B	C	D	E	F	Total
A	0	112	153	68	79	271	683
B	186	4	10	158	398	4	760
C	86	3	0	38	189	369	685
D	244	236	36	0	73	133	722
E	216	353	25	15	4	32	643
F	297	0	92	71	19	952	1431
Total	1030	707	315	350	761	1761	4924

0800-0900 ALL VEHICLES

	2016	2030 DM	2030DS	Change
A	695	790	792	2
B	788	892	754	-138
C	637	619	654	35
D	610	824	783	-41
E	722	843	795	-48
F	506	478	1504	1026
Total	3958	4446	5282	836
				19%

0800-0900 ALL VEHICLES

	A	B	C	D	E	F	Total
A	0	123	133	79	202	253	790
B	107	1	14	165	603	1	892
C	50	1	0	68	199	302	619
D	242	270	39	0	139	134	824
E	151	474	116	64	0	39	843
F	252	0	136	65	18	7	478
Total	690	671	366	371	946	586	4446

HGV

	A	B	C	D	E	F	Total
A	0	123	133	79	203	254	792
B	90	1	12	140	510	1	754
C	52	1	0	71	210	319	654
D	230	257	37	0	132	127	783
E	142	447	109	60	0	36	795
F	291	0	157	75	21	1026	1504
Total	806	829	449	426	1076	1763	5282

1700-1800 ALL VEHICLES

	2016	2030 DM	2030DS	Change
A	854	837	828	-9
B	442	667	547	-120
C	501	498	510	12
D	410	493	494	1
E	988	993	906	-87
F	805	700	1968	1268
Total	4000	4188	5253	1065
				25%

1700-1800 ALL VEHICLES PM

	A	B	C	D	E	F	Total
A	1	125	116	164	164	267	837
B	73	2	23	201	368	0	667
C	24	1	0	65	146	262	498
D	46	315	17	0	43	72	493
E	283	406	164	104	0	36	993
F	255	0	322	107	15	1	700
Total	594	656	595	557	643	515	4188

HGV

	A	B	C	D	E	F	Total
A	1	124	115	162	162	264	828
B	60	2	19	165	302	0	547
C	25	1	0	67	149	268	510
D	46	315	18	0	43	72	494
E	259	370	150	95	0	33	906
F	370	0	467	156	22	1268	1968
Total	760	812	768	644	678	1905	5253

Manorway Traffic Flows
Survey Date 23/11/22

A	A13 EAST / NORTH
B	Manorway
C	A1013
D	A13 S / W
E	B1007

0700-0800 ALL VEHICLES

	A	B	C	D	E	Total
A	0	210	179	0	44	433
B	371	0	79	982	169	1601
C	89	62	0	30	143	324
D	0	637	3	3	89	732
E	48	154	29	206	0	437
Total	508	1063	290	1221	445	3527

HGV

	A	B	C	D	E	Total
A	0	63	47	0	22	132
B	110	0	6	325	35	476
C	31	10	0	5	28	74
D	0	248	1	3	23	275
E	7	30	7	49	0	93
Total	148	351	61	382	108	1050

0800-0900 ALL VEHICLES

	A	B	C	D	E	Total
A	0	217	165	3	32	417
B	372	0	159	839	230	1600
C	112	104	0	45	205	466
D	0	710	4	3	118	835
E	59	214	41	206	0	520
Total	543	1245	369	1096	585	3838

HGV

	A	B	C	D	E	Total
A	0	45	34	1	10	90
B	131	0	15	261	48	455
C	21	9	0	7	14	51
D	0	226	2	3	23	254
E	15	31	7	50	0	103
Total	167	311	58	322	95	953

1700-1800 ALL VEHICLES PM

	A	B	C	D	E	Total
A	0	343	195	0	28	566
B	482	0	129	740	125	1476
C	121	119	0	13	154	407
D	0	1024	0	0	203	1227
E	84	317	34	146	0	581
Total	687	1803	358	899	510	4257

HGV

	A	B	C	D	E	Total
A	0	63	24	0	4	91
B	70	0	9	195	15	289
C	16	5	0	0	19	40
D	0	254	0	0	35	289
E	14	50	3	16	0	83
Total	100	372	36	211	73	792

LTC Flows

2030 DM

0700-0800 ALL VEHICLES

	A	B	C	D	E	Total
A						0
B						0
C						0
D						0
E						0
Total	0	0	0	0	0	0

0800-0900 ALL VEHICLES

	A	B	C	D	E	Total
A	0	317	71	0	15	403
B	418	0	34	1012	81	1545
C	255	77	0	0	38	370
D	0	1101	0	0	408	1509
E	24	184	50	318	0	576
Total	697	1679	155	1330	542	4403

1700-1800 ALL VEHICLES PM

	A	B	C	D	E	Total
A	0	353	91	0	11	455
B	563	0	77	1206	428	2274
C	176	31	0	0	74	281
D	0	1012	0	0	452	1464
E	25	257	30	209	0	521
Total	764	1653	198	1415	965	4995

2030 DS

0700-0800 ALL VEHICLES

	A	B	C	D	E	Total
A						0
B						0
C						0
D						0
E						0
Total	0	0	0	0	0	0

0800-0900 ALL VEHICLES

	A	B	C	D	E	Total
A	0	313	86	0	10	409
B	365	0	33	1295	75	1768
C	199	80	0	83	31	393
D	0	1266	0	0	415	1681
E	23	69	41	443	0	576
Total	587	1728	160	1821	531	4827

1700-1800 ALL VEHICLES PM

	A	B	C	D	E	Total
A	0	294	106	0	10	410
B	228	0	72	1628	351	2279
C	47	46	0	120	107	320
D	0	1197	0	0	408	1605
E	18	225	45	237	0	525
Total	293	1762	223	1985	876	5139

2030 Difference

0700-0800 ALL VEHICLES

	A	B	C	D	E	Total
A						0
B						0
C						0
D						0
E						0
Total	0	0	0	0	0	0

0800-0900 ALL VEHICLES

	A	B	C	D	E	Total
A	0	-4	15	0	-5	6
B	-53	0	-1	283	-6	223
C	-56	3	0	83	-7	23
D	0	165	0	0	7	172
E	-1	-115	-9	125	0	0
Total	-110	49	5	491	-11	424

1700-1800 ALL VEHICLES PM

	A	B	C	D	E	Total
A	0	-59	15	0	-1	-45
B	-335	0	-5	422	-77	5
C	-129	15	0	120	33	39
D	0	185	0	0	-44	141
E	-7	-32	15	28	0	4
Total	-471	109	25	570	-89	144

Appendix D

Basic Results Summary

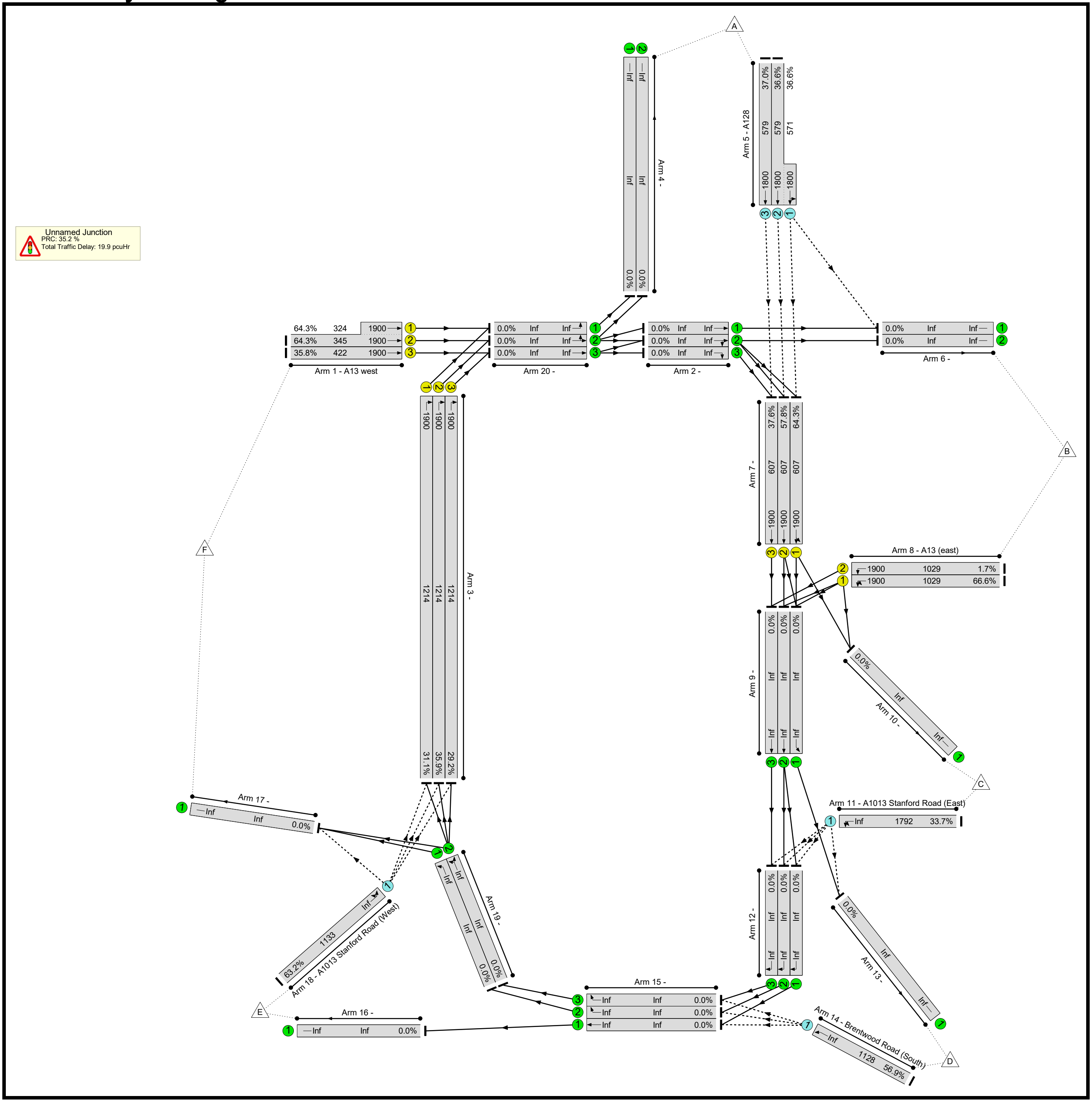
User and Project Details

Project:	**London Gateway**
Title:	**LTC Review**
Location:	
Additional detail:	
File name:	Orsett Cock v2.lsg3x
Author:	
Company:	DTA
Address:	Henley in Arden

Basic Results Summary

Scenario 1: '2022 AM' (FG1: '2022 SURVEY AM', 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: LTC Review	-	-	-		-	-	-	-	-	-	**66.6%**	**3018**	**0**	**0**	**19.9**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**66.6%**	**3018**	**0**	**0**	**19.9**	-	-
1/2+1/1	A13 west Ahead	U	A		1	15	-	430	1900:1900	345+324	64.3 : 64.3%	-	-	-	3.8	32.0	4.8
1/3	A13 west Ahead	U	A		1	15	-	151	1900	422	35.8%	-	-	-	1.3	30.3	2.8
3/1	Right	U	B		1	45	-	377	1900	1214	31.1%	-	-	-	0.9	8.3	3.7
3/2	Right	U	B		1	45	-	436	1900	1214	35.9%	-	-	-	1.0	8.4	4.3
3/3	Right	U	B		1	45	-	354	1900	1214	29.2%	-	-	-	0.8	7.9	3.3
5/2+5/1	A128 Left Ahead	O	-		-	-	-	421	1800:1800	579+571	36.6 : 36.6%	842	0	0	0.3	2.5	0.5
5/3	A128 Ahead	O	-		-	-	-	214	1800	579	37.0%	214	0	0	0.3	4.9	0.5
7/1	Ahead Left	U	E		1	22	-	390	1900	607	64.3%	-	-	-	2.7	24.8	5.7
7/2	Ahead	U	E		1	22	-	351	1900	607	57.8%	-	-	-	2.4	24.3	5.5
7/3	Ahead	U	E		1	22	-	228	1900	607	37.6%	-	-	-	1.4	22.7	3.6
8/1	A13 (east) Left U-Turn	U	D		1	38	-	685	1900	1029	66.6%	-	-	-	3.2	17.0	10.7
8/2	A13 (east) Left	U	D		1	38	-	17	1900	1029	1.7%	-	-	-	0.0	9.6	0.2
11/1	A1013 Stanford Road (East) Left Left2	O	-		-	-	-	604	Inf	1792	33.7%	604	0	0	0.3	1.6	1.4
14/1	Brentwood Road (South) Ahead	O	-		-	-	-	642	Inf	1128	56.9%	642	0	0	0.7	3.7	1.9
18/1	A1013 Stanford Road (West) Left Left2	O	-		-	-	-	716	Inf	1133	63.2%	716	0	0	0.9	4.3	1.5

C1 Stream: 1 PRC for Signalled Lanes (%): 40.0 Total Delay for Signalled Lanes (pcuHr): 7.76 Cycle Time (s): 72
C1 Stream: 2 PRC for Signalled Lanes (%): 35.2 Total Delay for Signalled Lanes (pcuHr): 9.78 Cycle Time (s): 72
PRC Over All Lanes (%): 35.2 Total Delay Over All Lanes(pcuHr): 19.92

Basic Results Summary

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E	F
A	0.0	7.5	48.8	52.3	60.3	63.5
B	63.9	69.3	22.0	27.0	35.0	31.6
C	44.7	50.1	0.0	6.6	14.6	18.6
D	42.8	48.3	96.7	0.0	12.7	16.7
E	35.4	40.9	89.3	92.7	0.0	9.3
F	41.0	0.0	72.2	76.1	84.0	83.5

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E	F
A	0.0	2.5	30.8	29.3	29.3	28.5
B	23.9	24.3	17.0	17.0	17.0	9.6
C	9.7	10.1	0.0	1.6	1.6	1.6
D	11.8	11.9	47.3	0.0	3.7	3.7
E	12.4	12.5	47.8	46.0	0.0	4.3
F	32.0	0.0	44.7	43.6	43.4	39.5

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 1: 2022 AM
1	B	8/1	C	10/1	22.03
2	C	11/1	D	13/1	6.63
3	B	8/1	D	13/1	27.03
4	A	5/3	F	17/1	63.51
5	B	8/2	B	6/2	69.27
6	B	8/2	F	17/1	31.57
7	C	11/1	F	17/1	18.63
8	B	8/2	A	4/2	-
9	C	11/1	B	6/2	50.06
10	D	14/1	F	17/1	16.73
11	C	11/1	A	4/2	-
12	D	14/1	F	17/1	16.73
13	C	11/1	E	16/1	14.63
14	C	11/1	C	10/1	-
15	D	14/1	E	16/1	12.73
16	D	14/1	B	6/2	48.15
18	D	14/1	A	4/2	-
19	E	18/1	A	4/1	35.37
20	A	5/3	A	4/2	-
21	C	11/1	B	6/1	-
23	E	18/1	A	4/2	-
24	E	18/1	F	17/1	9.30
25	F	1/2	A	4/2	41.15
26	D	14/1	B	6/1	48.15
27	E	18/1	B	6/1	40.71
28	F	1/2	B	6/1	-
29	A	5/2	E	16/1	60.34
30	A	5/2	D	13/1	52.34
31	C	11/1	F	17/1	18.63
32	B	8/2	B	6/1	-
33	B	8/1	E	16/1	35.03
34	A	5/2	F	17/1	64.34
35	D	14/1	D	13/1	-
36	D	14/1	C	10/1	96.88
37	F	1/3	F	17/1	83.14
38	E	18/1	B	6/2	40.71
39	F	1/2	A	4/1	40.94
40	E	18/1	D	13/1	-
41	E	18/1	C	10/1	89.49
42	F	1/2	B	6/2	-
43	F	1/2	D	13/1	-

Basic Results Summary

44	A	5/2	D	13/1	-
45	A	5/2	C	10/1	48.78
46	F	1/2	C	10/1	72.34
47	B	8/2	B	6/2	-
48	A	5/2	B	6/1	7.47
49	C	11/1	B	6/2	-
50	C	11/1	C	10/1	-
51	D	14/1	B	6/2	48.59
52	D	14/1	D	13/1	-
53	D	14/1	C	10/1	96.56
54	E	18/1	B	6/2	41.16
55	E	18/1	D	13/1	94.12
56	E	18/1	C	10/1	89.12
57	F	1/3	B	6/2	-
58	F	1/3	D	13/1	77.16
59	F	1/3	C	10/1	72.16
60	B	8/1	F	17/1	-
63	F	1/3	F	17/1	-
64	D	14/1	D	13/1	-
65	D	14/1	D	13/1	-
66	E	18/1	E	16/1	-
67	E	18/1	D	13/1	92.98
68	E	18/1	E	16/1	-
69	E	18/1	D	13/1	92.60
70	F	1/3	E	16/1	83.92
71	F	1/3	D	13/1	75.92
72	F	1/2	E	16/1	84.10
73	F	1/2	D	13/1	76.10
74	F	1/2	F	17/1	88.10
75	A	5/3	A	4/1	-
76	B	8/2	A	4/1	63.89
77	C	11/1	A	4/1	44.71
78	D	14/1	A	4/1	42.81

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 1: 2022 AM
1	B	8/1	C	10/1	17.03
2	C	11/1	D	13/1	1.63
3	B	8/1	D	13/1	17.03
4	A	5/3	F	17/1	28.51
5	B	8/2	B	6/2	24.27
6	B	8/2	F	17/1	9.57
7	C	11/1	F	17/1	1.63
8	B	8/2	A	4/2	-
9	C	11/1	B	6/2	10.06
10	D	14/1	F	17/1	3.73
11	C	11/1	A	4/2	-
12	D	14/1	F	17/1	3.73
13	C	11/1	E	16/1	1.63
14	C	11/1	C	10/1	-
15	D	14/1	E	16/1	3.73
16	D	14/1	B	6/2	12.15
18	D	14/1	A	4/2	-
19	E	18/1	A	4/1	12.37
20	A	5/3	A	4/2	-
21	C	11/1	B	6/1	-
23	E	18/1	A	4/2	-
24	E	18/1	F	17/1	4.30
25	F	1/2	A	4/2	32.15
26	D	14/1	B	6/1	12.15
27	E	18/1	B	6/1	12.71
28	F	1/2	B	6/1	-
29	A	5/2	E	16/1	29.34
30	A	5/2	D	13/1	29.34
31	C	11/1	F	17/1	1.63
32	B	8/2	B	6/1	-
33	B	8/1	E	16/1	17.03
34	A	5/2	F	17/1	29.34
35	D	14/1	D	13/1	-
36	D	14/1	C	10/1	47.88
37	F	1/3	F	17/1	39.14
38	E	18/1	B	6/2	12.71
39	F	1/2	A	4/1	31.94
40	E	18/1	D	13/1	-
41	E	18/1	C	10/1	48.49
42	F	1/2	B	6/2	-
43	F	1/2	D	13/1	-

Basic Results Summary

44	A	5/2	D	13/1	-
45	A	5/2	C	10/1	30.78
46	F	1/2	C	10/1	45.34
47	B	8/2	B	6/2	-
48	A	5/2	B	6/1	2.47
49	C	11/1	B	6/2	-
50	C	11/1	C	10/1	-
51	D	14/1	B	6/2	11.59
52	D	14/1	D	13/1	-
53	D	14/1	C	10/1	46.56
54	E	18/1	B	6/2	12.16
55	E	18/1	D	13/1	47.12
56	E	18/1	C	10/1	47.12
57	F	1/3	B	6/2	-
58	F	1/3	D	13/1	44.16
59	F	1/3	C	10/1	44.16
60	B	8/1	F	17/1	-
63	F	1/3	F	17/1	-
64	D	14/1	D	13/1	-
65	D	14/1	D	13/1	-
66	E	18/1	E	16/1	-
67	E	18/1	D	13/1	46.98
68	E	18/1	E	16/1	-
69	E	18/1	D	13/1	45.60
70	F	1/3	E	16/1	42.92
71	F	1/3	D	13/1	42.92
72	F	1/2	E	16/1	44.10
73	F	1/2	D	13/1	44.10
74	F	1/2	F	17/1	44.10
75	A	5/3	A	4/1	-
76	B	8/2	A	4/1	23.89
77	C	11/1	A	4/1	9.71
78	D	14/1	A	4/1	11.81

Basic Results Summary

Traffic Flows, Actual

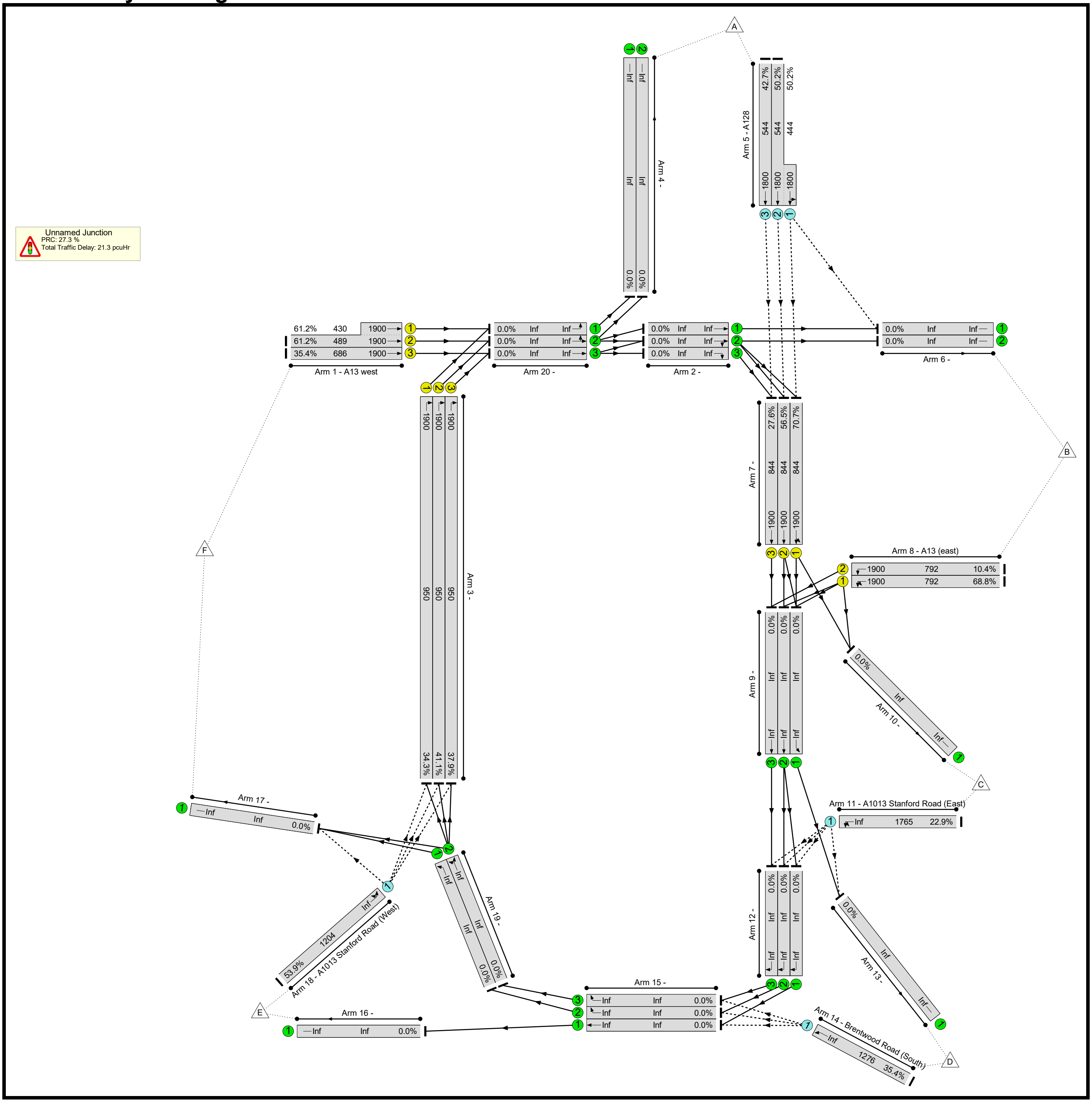
Actual Flow :

		Destination						
		A	B	C	D	E	F	Tot.
Origin	A	0	110	99	59	150	217	635
	B	15	1	13	141	531	1	702
	C	47	1	0	65	193	298	604
	D	190	211	30	0	111	100	642
	E	125	390	102	55	0	44	716
	F	324	0	150	66	26	15	581
	Tot.	701	713	394	386	1011	675	3880

Basic Results Summary

Scenario 2: '2022 PM' (FG2: '2022 SURVEY PM', 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: LTC Review	-	-	-		-	-	-	-	-	-	**70.7%**	**2729**	**0**	**0**	**21.3**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**70.7%**	**2729**	**0**	**0**	**21.3**	-	-
1/2+1/1	A13 west Ahead	U	A		1	25	-	562	1900:1900	489+430	61.2 : 61.2%	-	-	-	3.5	22.3	5.3
1/3	A13 west Ahead	U	A		1	25	-	243	1900	686	35.4%	-	-	-	1.4	20.9	3.8
3/1	Right	U	B		1	35	-	326	1900	950	34.3%	-	-	-	1.5	16.5	4.8
3/2	Right	U	B		1	35	-	390	1900	950	41.1%	-	-	-	1.6	14.6	5.2
3/3	Right	U	B		1	35	-	360	1900	950	37.9%	-	-	-	1.4	14.2	4.7
5/2+5/1	A128 Left Ahead	O	-		-	-	-	496	1800:1800	544+444	50.2 : 50.2%	992	0	0	0.5	3.7	1.2
5/3	A128 Ahead	O	-		-	-	-	232	1800	544	42.7%	232	0	0	0.4	5.8	0.8
7/1	Ahead Left	U	E		1	31	-	597	1900	844	70.7%	-	-	-	2.7	16.3	6.2
7/2	Ahead	U	E		1	31	-	477	1900	844	56.5%	-	-	-	2.2	16.9	6.2
7/3	Ahead	U	E		1	31	-	233	1900	844	27.6%	-	-	-	1.0	15.6	3.1
8/1	A13 (east) Left U-Turn	U	D		1	29	-	545	1900	792	68.8%	-	-	-	3.7	24.4	9.9
8/2	A13 (east) Left	U	D		1	29	-	82	1900	792	10.4%	-	-	-	0.3	15.4	1.0
11/1	A1013 Stanford Road (East) Left Left2	O	-		-	-	-	404	Inf	1765	22.9%	404	0	0	0.2	1.3	0.5
14/1	Brentwood Road (South) Ahead	O	-		-	-	-	452	Inf	1276	35.4%	452	0	0	0.3	2.2	0.3
18/1	A1013 Stanford Road (West) Left Left2	O	-		-	-	-	649	Inf	1204	53.9%	649	0	0	0.6	3.2	0.6

C1 Stream: 1 PRC for Signalled Lanes (%): 47.1 Total Delay for Signalled Lanes (pcuHr): 9.39 Cycle Time (s): 72
C1 Stream: 2 PRC for Signalled Lanes (%): 27.3 Total Delay for Signalled Lanes (pcuHr): 10.00 Cycle Time (s): 72
PRC Over All Lanes (%): 27.3 Total Delay Over All Lanes(pcuHr): 21.28

Basic Results Summary

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E	F
A	81.2	8.7	42.8	45.7	53.7	56.5
B	79.1	84.6	29.4	34.4	42.4	0.0
C	50.6	56.5	0.0	6.3	14.3	18.3
D	47.4	53.0	95.3	0.0	11.2	15.2
E	40.5	46.1	88.4	91.1	0.0	8.2
F	31.1	0.0	59.5	62.3	70.3	70.5

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E	F
A	28.2	3.7	24.8	22.7	22.7	21.5
B	39.1	39.1	24.4	24.4	24.4	0.0
C	15.6	15.5	0.0	1.3	1.3	1.3
D	16.4	16.6	45.8	0.0	2.2	2.2
E	17.5	17.6	46.8	44.6	0.0	3.2
F	22.1	0.0	32.0	29.8	29.7	26.5

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 2: 2022 PM
1	B	8/1	C	10/1	29.41
2	C	11/1	D	13/1	6.34
3	B	8/1	D	13/1	34.41
4	A	5/3	F	17/1	56.45
5	B	8/2	B	6/2	-
6	B	8/2	F	17/1	-
7	C	11/1	F	17/1	18.34
8	B	8/2	A	4/2	-
9	C	11/1	B	6/2	-
10	D	14/1	F	17/1	15.18
11	C	11/1	A	4/2	-
12	D	14/1	F	17/1	15.18
13	C	11/1	E	16/1	14.34
14	C	11/1	C	10/1	-
15	D	14/1	E	16/1	11.18
16	D	14/1	B	6/2	52.73
18	D	14/1	A	4/2	-
19	E	18/1	A	4/1	40.47
20	A	5/3	A	4/2	-
21	C	11/1	B	6/1	-
23	E	18/1	A	4/2	-
24	E	18/1	F	17/1	8.24
25	F	1/2	A	4/2	31.47
26	D	14/1	B	6/1	52.73
27	E	18/1	B	6/1	45.78
28	F	1/2	B	6/1	-
29	A	5/2	E	16/1	53.72
30	A	5/2	D	13/1	45.72
31	C	11/1	F	17/1	18.34
32	B	8/2	B	6/1	84.37
33	B	8/1	E	16/1	42.41
34	A	5/2	F	17/1	-
35	D	14/1	D	13/1	-
36	D	14/1	C	10/1	95.42
37	F	1/3	F	17/1	70.52
38	E	18/1	B	6/2	45.78
39	F	1/2	A	4/1	31.09
40	E	18/1	D	13/1	-
41	E	18/1	C	10/1	88.48
42	F	1/2	B	6/2	-
43	F	1/2	D	13/1	-

Basic Results Summary

44	A	5/2	D	13/1	-
45	A	5/2	C	10/1	42.84
46	F	1/2	C	10/1	59.48
47	B	8/2	B	6/2	84.92
48	A	5/2	B	6/1	8.65
49	C	11/1	B	6/2	56.51
50	C	11/1	C	10/1	-
51	D	14/1	B	6/2	53.35
52	D	14/1	D	13/1	-
53	D	14/1	C	10/1	95.17
54	E	18/1	B	6/2	46.40
55	E	18/1	D	13/1	93.23
56	E	18/1	C	10/1	88.23
57	F	1/3	B	6/2	-
58	F	1/3	D	13/1	64.54
59	F	1/3	C	10/1	59.54
60	B	8/1	F	17/1	-
63	F	1/3	F	17/1	-
64	D	14/1	D	13/1	-
65	D	14/1	D	13/1	-
66	E	18/1	E	16/1	-
67	E	18/1	D	13/1	91.21
68	E	18/1	E	16/1	-
69	E	18/1	D	13/1	90.96
70	F	1/3	E	16/1	70.29
71	F	1/3	D	13/1	62.29
72	F	1/2	E	16/1	70.26
73	F	1/2	D	13/1	62.26
74	F	1/2	F	17/1	-
75	A	5/3	A	4/1	81.17
76	B	8/2	A	4/1	79.08
77	C	11/1	A	4/1	50.57
78	D	14/1	A	4/1	47.41

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 2: 2022 PM
1	B	8/1	C	10/1	24.41
2	C	11/1	D	13/1	1.34
3	B	8/1	D	13/1	24.41
4	A	5/3	F	17/1	21.45
5	B	8/2	B	6/2	-
6	B	8/2	F	17/1	-
7	C	11/1	F	17/1	1.34
8	B	8/2	A	4/2	-
9	C	11/1	B	6/2	-
10	D	14/1	F	17/1	2.18
11	C	11/1	A	4/2	-
12	D	14/1	F	17/1	2.18
13	C	11/1	E	16/1	1.34
14	C	11/1	C	10/1	-
15	D	14/1	E	16/1	2.18
16	D	14/1	B	6/2	16.73
18	D	14/1	A	4/2	-
19	E	18/1	A	4/1	17.47
20	A	5/3	A	4/2	-
21	C	11/1	B	6/1	-
23	E	18/1	A	4/2	-
24	E	18/1	F	17/1	3.24
25	F	1/2	A	4/2	22.47
26	D	14/1	B	6/1	16.73
27	E	18/1	B	6/1	17.78
28	F	1/2	B	6/1	-
29	A	5/2	E	16/1	22.72
30	A	5/2	D	13/1	22.72
31	C	11/1	F	17/1	1.34
32	B	8/2	B	6/1	39.37
33	B	8/1	E	16/1	24.41
34	A	5/2	F	17/1	-
35	D	14/1	D	13/1	-
36	D	14/1	C	10/1	46.42
37	F	1/3	F	17/1	26.52
38	E	18/1	B	6/2	17.78
39	F	1/2	A	4/1	22.09
40	E	18/1	D	13/1	-
41	E	18/1	C	10/1	47.48
42	F	1/2	B	6/2	-
43	F	1/2	D	13/1	-

Basic Results Summary

44	A	5/2	D	13/1	-
45	A	5/2	C	10/1	24.84
46	F	1/2	C	10/1	32.48
47	B	8/2	B	6/2	38.92
48	A	5/2	B	6/1	3.65
49	C	11/1	B	6/2	15.51
50	C	11/1	C	10/1	-
51	D	14/1	B	6/2	16.35
52	D	14/1	D	13/1	-
53	D	14/1	C	10/1	45.17
54	E	18/1	B	6/2	17.40
55	E	18/1	D	13/1	46.23
56	E	18/1	C	10/1	46.23
57	F	1/3	B	6/2	-
58	F	1/3	D	13/1	31.54
59	F	1/3	C	10/1	31.54
60	B	8/1	F	17/1	-
63	F	1/3	F	17/1	-
64	D	14/1	D	13/1	-
65	D	14/1	D	13/1	-
66	E	18/1	E	16/1	-
67	E	18/1	D	13/1	45.21
68	E	18/1	E	16/1	-
69	E	18/1	D	13/1	43.96
70	F	1/3	E	16/1	29.29
71	F	1/3	D	13/1	29.29
72	F	1/2	E	16/1	30.26
73	F	1/2	D	13/1	30.26
74	F	1/2	F	17/1	-
75	A	5/3	A	4/1	28.17
76	B	8/2	A	4/1	39.08
77	C	11/1	A	4/1	15.57
78	D	14/1	A	4/1	16.41

Basic Results Summary

Traffic Flows, Actual

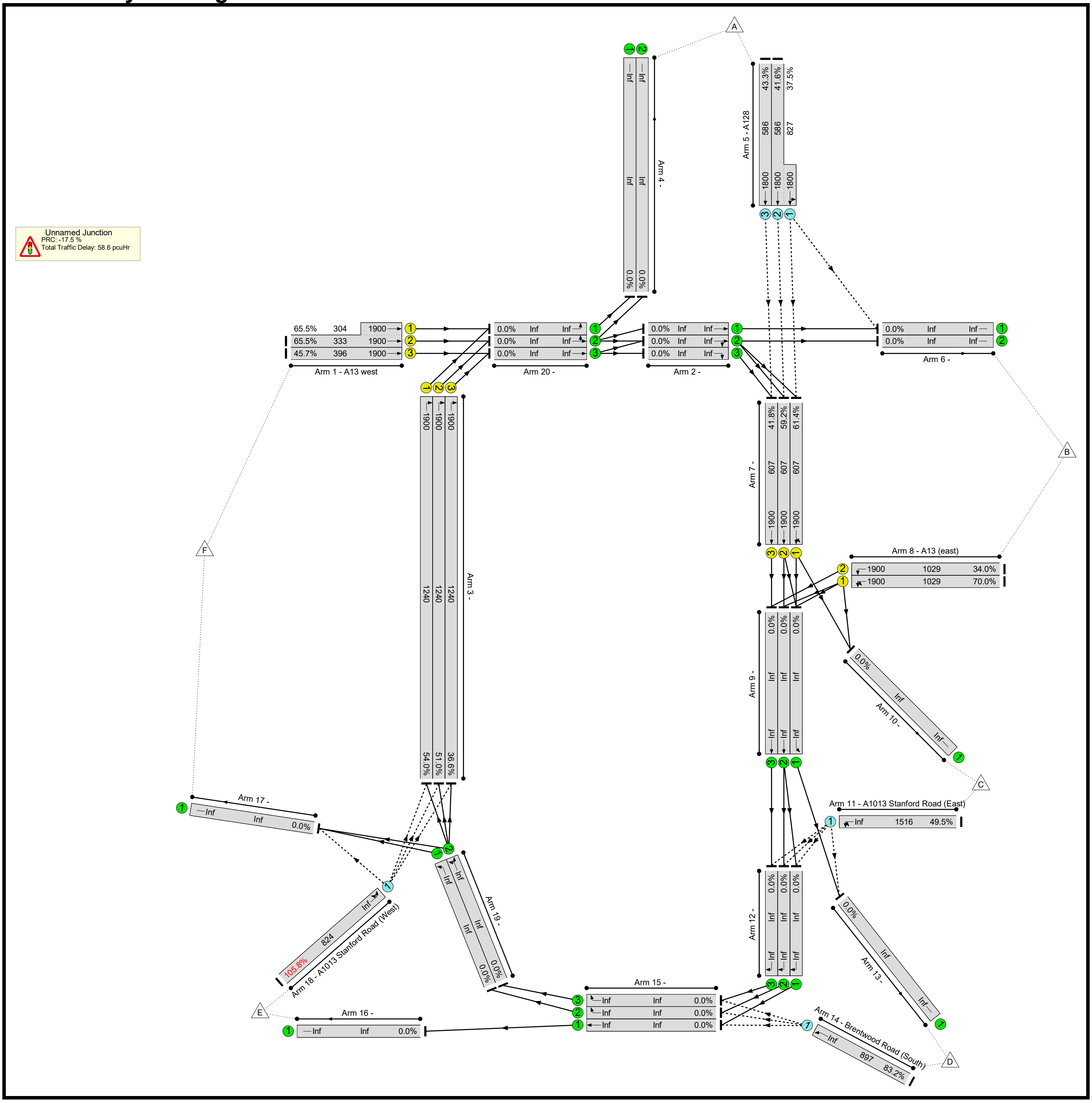
Actual Flow :

		Destination						
Origin		A	B	C	D	E	F	Tot.
	A	2	120	103	138	135	230	728
	B	80	2	21	186	338	0	627
	C	19	1	0	54	121	209	404
	D	42	289	16	0	39	66	452
	E	183	262	113	67	0	24	649
	F	302	0	363	119	20	1	805
	Tot.	628	674	616	564	653	530	3665

Basic Results Summary

Scenario 3: '2030 DM pAM' (FG3: '2030 LDO pAM DM', 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: LTC Review	-	-	-		-	-	-	-	-	-	**105.8%**	**3683**	**0**	**0**	**58.6**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**105.8%**	**3683**	**0**	**0**	**58.6**	-	-
1/2+1/1	A13 west Ahead	U	A		1	14	-	417	1900:1900	333+304	65.5 : 65.5%	-	-	-	3.9	33.5	4.8
1/3	A13 west Ahead	U	A		1	14	-	181	1900	396	45.7%	-	-	-	1.7	33.3	3.6
3/1	Right	U	B		1	46	-	680	1900	1240	54.0%	-	-	-	1.3	7.1	7.1
3/2	Right	U	B		1	46	-	651	1900	1240	51.0%	-	-	-	1.4	7.8	6.1
3/3	Right	U	B		1	46	-	471	1900	1240	36.6%	-	-	-	0.9	7.2	4.0
5/2+5/1	A128 Left Ahead	O	-		-	-	-	554	1800:1800	586+827	41.6 : 37.5%	1108	0	0	0.3	2.1	0.3
5/3	A128 Ahead	O	-		-	-	-	254	1800	586	43.3%	254	0	0	0.4	5.4	0.4
7/1	Ahead Left	U	E		1	22	-	375	1900	607	61.4%	-	-	-	2.7	26.2	7.3
7/2	Ahead	U	E		1	22	-	361	1900	607	59.2%	-	-	-	2.6	26.4	6.9
7/3	Ahead	U	E		1	22	-	254	1900	607	41.8%	-	-	-	1.7	24.3	4.3
8/1	A13 (east) Left U-Turn	U	D		1	38	-	720	1900	1029	70.0%	-	-	-	3.6	18.0	11.8
8/2	A13 (east) Left	U	D		1	38	-	350	1900	1029	34.0%	-	-	-	1.2	11.9	4.1
11/1	A1013 Stanford Road (East) Left Left2	O	-		-	-	-	751	Inf	1516	49.5%	751	0	0	0.7	3.1	3.4
14/1	Brentwood Road (South) Ahead	O	-		-	-	-	746	Inf	897	83.2%	746	0	0	2.8	13.3	9.0
18/1	A1013 Stanford Road (West) Left Left2	O	-		-	-	-	872	Inf	824	105.8%	824	0	0	33.5	138.4	83.2

C1 Stream: 1 PRC for Signalled Lanes (%):	37.4	Total Delay for Signalled Lanes (pcuHr):	9.16	Cycle Time (s):	72
C1 Stream: 2 PRC for Signalled Lanes (%):	28.6	Total Delay for Signalled Lanes (pcuHr):	11.81	Cycle Time (s):	72
PRC Over All Lanes (%):	-17.5	Total Delay Over All Lanes(pcuHr):	58.61		

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E	F
A	0.0	7.1	48.0	52.6	60.6	64.7
B	57.0	61.7	23.0	28.0	36.0	33.9
C	46.7	51.7	0.0	8.1	16.1	20.1
D	52.9	57.9	96.2	0.0	22.3	26.3
E	169.5	174.4	213.6	218.3	226.2	143.4
F	42.5	0.0	85.1	89.7	97.7	0.0

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E	F
A	0.0	2.1	30.0	29.6	29.6	29.7
B	17.0	16.3	18.0	18.0	18.0	11.9
C	11.7	11.3	0.0	3.1	3.1	3.1
D	21.9	21.3	46.8	0.0	13.3	13.3
E	146.5	145.8	172.3	171.6	171.9	138.4
F	33.5	0.0	57.3	56.9	56.8	0.0

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 3: 2030 DM pAM
1	B	8/1	C	10/1	22.96
2	C	11/1	D	13/1	8.15
3	B	8/1	D	13/1	27.96
4	A	5/3	F	17/1	64.75
5	B	8/2	B	6/2	61.89
6	B	8/2	F	17/1	33.93
7	C	11/1	F	17/1	20.15
8	B	8/2	A	4/2	56.89
9	C	11/1	B	6/2	51.71
10	D	14/1	F	17/1	26.31
11	C	11/1	A	4/2	46.71
12	D	14/1	F	17/1	26.31
13	C	11/1	E	16/1	16.15
14	C	11/1	C	10/1	-
15	D	14/1	E	16/1	22.31
16	D	14/1	B	6/2	57.89
18	D	14/1	A	4/2	52.89
19	E	18/1	A	4/1	169.54
20	A	5/3	A	4/2	-
21	C	11/1	B	6/1	51.71
23	E	18/1	A	4/2	169.42
24	E	18/1	F	17/1	143.40
25	F	1/2	A	4/2	42.63
26	D	14/1	B	6/1	57.89
27	E	18/1	B	6/1	174.42
28	F	1/2	B	6/1	-
29	A	5/2	E	16/1	60.63
30	A	5/2	D	13/1	52.63
31	C	11/1	F	17/1	20.15
32	B	8/2	B	6/1	61.89
33	B	8/1	E	16/1	35.96
34	A	5/2	F	17/1	64.63
35	D	14/1	D	13/1	-
36	D	14/1	C	10/1	97.00
37	F	1/3	F	17/1	-
38	E	18/1	B	6/2	174.42
39	F	1/2	A	4/1	42.34
40	E	18/1	D	13/1	-
41	E	18/1	C	10/1	213.53
42	F	1/2	B	6/2	-
43	F	1/2	D	13/1	-

Basic Results Summary

44	A	5/2	D	13/1	-
45	A	5/2	C	10/1	48.03
46	F	1/2	C	10/1	84.99
47	B	8/2	B	6/2	61.40
48	A	5/2	B	6/1	7.09
49	C	11/1	B	6/2	51.62
50	C	11/1	C	10/1	-
51	D	14/1	B	6/2	57.83
52	D	14/1	D	13/1	-
53	D	14/1	C	10/1	95.45
54	E	18/1	B	6/2	174.47
55	E	18/1	D	13/1	-
56	E	18/1	C	10/1	213.76
57	F	1/3	B	6/2	-
58	F	1/3	D	13/1	90.13
59	F	1/3	C	10/1	85.13
60	B	8/1	F	17/1	-
63	F	1/3	F	17/1	-
64	D	14/1	D	13/1	-
65	D	14/1	D	13/1	-
66	E	18/1	E	16/1	226.11
67	E	18/1	D	13/1	218.11
68	E	18/1	E	16/1	226.34
69	E	18/1	D	13/1	218.34
70	F	1/3	E	16/1	97.68
71	F	1/3	D	13/1	89.68
72	F	1/2	E	16/1	97.57
73	F	1/2	D	13/1	89.57
74	F	1/2	F	17/1	-
75	A	5/3	A	4/1	-
76	B	8/2	A	4/1	56.98
77	C	11/1	A	4/1	46.66
78	D	14/1	A	4/1	52.84

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 3: 2030 DM pAM
1	B	8/1	C	10/1	17.96
2	C	11/1	D	13/1	3.15
3	B	8/1	D	13/1	17.96
4	A	5/3	F	17/1	29.75
5	B	8/2	B	6/2	16.89
6	B	8/2	F	17/1	11.93
7	C	11/1	F	17/1	3.15
8	B	8/2	A	4/2	16.89
9	C	11/1	B	6/2	11.71
10	D	14/1	F	17/1	13.31
11	C	11/1	A	4/2	11.71
12	D	14/1	F	17/1	13.31
13	C	11/1	E	16/1	3.15
14	C	11/1	C	10/1	-
15	D	14/1	E	16/1	13.31
16	D	14/1	B	6/2	21.89
18	D	14/1	A	4/2	21.89
19	E	18/1	A	4/1	146.54
20	A	5/3	A	4/2	-
21	C	11/1	B	6/1	11.71
23	E	18/1	A	4/2	146.42
24	E	18/1	F	17/1	138.40
25	F	1/2	A	4/2	33.63
26	D	14/1	B	6/1	21.89
27	E	18/1	B	6/1	146.42
28	F	1/2	B	6/1	-
29	A	5/2	E	16/1	29.63
30	A	5/2	D	13/1	29.63
31	C	11/1	F	17/1	3.15
32	B	8/2	B	6/1	16.89
33	B	8/1	E	16/1	17.96
34	A	5/2	F	17/1	29.63
35	D	14/1	D	13/1	-
36	D	14/1	C	10/1	48.00
37	F	1/3	F	17/1	-
38	E	18/1	B	6/2	146.42
39	F	1/2	A	4/1	33.34
40	E	18/1	D	13/1	-
41	E	18/1	C	10/1	172.53
42	F	1/2	B	6/2	-
43	F	1/2	D	13/1	-

Basic Results Summary

44	A	5/2	D	13/1	-
45	A	5/2	C	10/1	30.03
46	F	1/2	C	10/1	57.99
47	B	8/2	B	6/2	15.40
48	A	5/2	B	6/1	2.09
49	C	11/1	B	6/2	10.62
50	C	11/1	C	10/1	-
51	D	14/1	B	6/2	20.83
52	D	14/1	D	13/1	-
53	D	14/1	C	10/1	45.45
54	E	18/1	B	6/2	145.47
55	E	18/1	D	13/1	-
56	E	18/1	C	10/1	171.76
57	F	1/3	B	6/2	-
58	F	1/3	D	13/1	57.13
59	F	1/3	C	10/1	57.13
60	B	8/1	F	17/1	-
63	F	1/3	F	17/1	-
64	D	14/1	D	13/1	-
65	D	14/1	D	13/1	-
66	E	18/1	E	16/1	172.11
67	E	18/1	D	13/1	172.11
68	E	18/1	E	16/1	171.34
69	E	18/1	D	13/1	171.34
70	F	1/3	E	16/1	56.68
71	F	1/3	D	13/1	56.68
72	F	1/2	E	16/1	57.57
73	F	1/2	D	13/1	57.57
74	F	1/2	F	17/1	-
75	A	5/3	A	4/1	-
76	B	8/2	A	4/1	16.98
77	C	11/1	A	4/1	11.66
78	D	14/1	A	4/1	21.84

Basic Results Summary

Traffic Flows, Actual

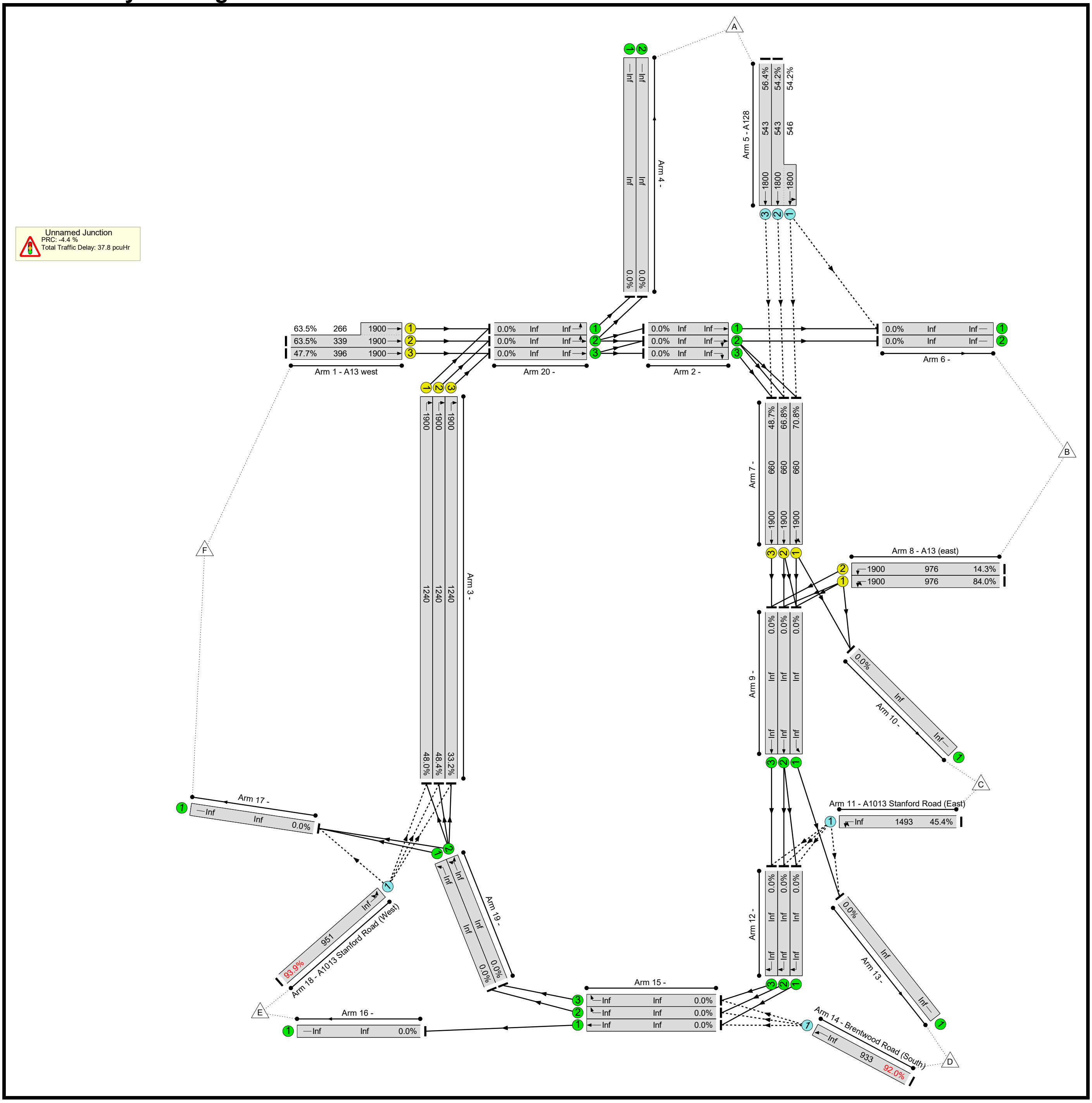
Actual Flow :

	Destination							
Origin		A	B	C	D	E	F	Tot.
	A	0	141	169	71	92	335	808
	B	338	7	12	204	504	5	1070
	C	98	3	0	45	202	403	751
	D	255	244	39	0	74	134	746
	E	290	454	45	21	8	54	872
	F	388	0	110	74	26	0	598
	Tot.	1369	849	375	415	906	931	4845

Basic Results Summary

Scenario 4: '2030 DM AM' (FG4: '2030 LDO AM DM', 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: LTC Review	-	-	-		-	-	-	-	-	-	**93.9%**	**3916**	**0**	**0**	**37.8**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**93.9%**	**3916**	**0**	**0**	**37.8**	-	-
1/2+1/1	A13 west Ahead	U	A		1	14	-	384	1900:1900	339+266	63.5 : 63.5%	-	-	-	3.5	33.2	4.7
1/3	A13 west Ahead	U	A		1	14	-	189	1900	396	47.7%	-	-	-	1.8	33.7	3.8
3/1	Right	U	B		1	46	-	595	1900	1240	48.0%	-	-	-	1.2	7.2	6.3
3/2	Right	U	B		1	46	-	600	1900	1240	48.4%	-	-	-	1.3	8.0	6.0
3/3	Right	U	B		1	46	-	412	1900	1240	33.2%	-	-	-	0.8	6.9	3.6
5/2+5/1	A128 Left Ahead	O	-		-	-	-	590	1800:1800	543+546	54.2 : 54.2%	1180	0	0	0.6	3.7	1.4
5/3	A128 Ahead	O	-		-	-	-	306	1800	543	56.4%	306	0	0	0.7	7.7	1.5
7/1	Ahead Left	U	E		1	24	-	467	1900	660	70.8%	-	-	-	3.5	26.8	9.3
7/2	Ahead	U	E		1	24	-	441	1900	660	66.8%	-	-	-	3.3	26.9	8.5
7/3	Ahead	U	E		1	24	-	321	1900	660	48.7%	-	-	-	2.1	23.6	5.5
8/1	A13 (east) Left U-Turn	U	D		1	36	-	820	1900	976	84.0%	-	-	-	5.9	26.1	16.4
8/2	A13 (east) Left	U	D		1	36	-	140	1900	976	14.3%	-	-	-	0.4	11.4	1.5
11/1	A1013 Stanford Road (East) Left Left2	O	-		-	-	-	678	Inf	1493	45.4%	678	0	0	0.5	2.9	3.2
14/1	Brentwood Road (South) Ahead	O	-		-	-	-	859	Inf	933	92.0%	859	0	0	5.5	23.0	13.2
18/1	A1013 Stanford Road (West) Left Left2	O	-		-	-	-	893	Inf	951	93.9%	893	0	0	6.6	26.8	17.7

C1 Stream: 1 PRC for Signalled Lanes (%): 41.8 Total Delay for Signalled Lanes (pcuHr): 8.64 Cycle Time (s): 72
C1 Stream: 2 PRC for Signalled Lanes (%): 7.2 Total Delay for Signalled Lanes (pcuHr): 15.27 Cycle Time (s): 72
PRC Over All Lanes (%): -4.4 Total Delay Over All Lanes(pcuHr): 37.83

Basic Results Summary

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E	F
A	0.0	8.6	50.5	54.6	62.6	66.5
B	56.2	61.5	31.1	36.1	44.1	33.4
C	45.9	50.9	0.0	7.9	15.9	19.9
D	61.9	67.1	105.8	0.0	32.0	36.0
E	57.7	62.7	101.8	105.8	0.0	31.8
F	42.2	0.0	87.3	91.4	99.2	98.4

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E	F
A	0.0	3.6	32.5	31.6	31.6	31.5
B	16.2	16.5	26.1	26.1	26.1	11.4
C	10.9	9.9	0.0	2.9	2.9	2.9
D	30.9	30.6	56.6	0.0	23.0	23.0
E	34.7	34.3	60.6	59.2	0.0	26.8
F	33.2	0.0	59.6	58.6	58.5	54.4

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 4: 2030 DM AM
1	B	8/1	C	10/1	31.12
2	C	11/1	D	13/1	7.88
3	B	8/1	D	13/1	36.12
4	A	5/3	F	17/1	66.46
5	B	8/2	B	6/2	61.48
6	B	8/2	F	17/1	33.35
7	C	11/1	F	17/1	19.88
8	B	8/2	A	4/2	56.48
9	C	11/1	B	6/2	-
10	D	14/1	F	17/1	35.95
11	C	11/1	A	4/2	-
12	D	14/1	F	17/1	35.95
13	C	11/1	E	16/1	15.88
14	C	11/1	C	10/1	-
15	D	14/1	E	16/1	31.95
16	D	14/1	B	6/2	67.18
18	D	14/1	A	4/2	62.18
19	E	18/1	A	4/1	57.70
20	A	5/3	A	4/2	-
21	C	11/1	B	6/1	-
23	E	18/1	A	4/2	57.73
24	E	18/1	F	17/1	31.79
25	F	1/2	A	4/2	42.54
26	D	14/1	B	6/1	67.18
27	E	18/1	B	6/1	62.73
28	F	1/2	B	6/1	-
29	A	5/2	E	16/1	62.65
30	A	5/2	D	13/1	54.65
31	C	11/1	F	17/1	19.88
32	B	8/2	B	6/1	-
33	B	8/1	E	16/1	44.12
34	A	5/2	F	17/1	-
35	D	14/1	D	13/1	-
36	D	14/1	C	10/1	105.90
37	F	1/3	F	17/1	98.45
38	E	18/1	B	6/2	62.73
39	F	1/2	A	4/1	41.87
40	E	18/1	D	13/1	-
41	E	18/1	C	10/1	101.69
42	F	1/2	B	6/2	-
43	F	1/2	D	13/1	91.84

Basic Results Summary

44	A	5/2	D	13/1	-
45	A	5/2	C	10/1	50.50
46	F	1/2	C	10/1	86.84
47	B	8/2	B	6/2	-
48	A	5/2	B	6/1	8.60
49	C	11/1	B	6/2	50.95
50	C	11/1	C	10/1	-
51	D	14/1	B	6/2	66.89
52	D	14/1	D	13/1	-
53	D	14/1	C	10/1	105.46
54	E	18/1	B	6/2	62.74
55	E	18/1	D	13/1	-
56	E	18/1	C	10/1	102.08
57	F	1/3	B	6/2	-
58	F	1/3	D	13/1	92.46
59	F	1/3	C	10/1	87.46
60	B	8/1	F	17/1	-
63	F	1/3	F	17/1	-
64	D	14/1	D	13/1	-
65	D	14/1	D	13/1	-
66	E	18/1	E	16/1	-
67	E	18/1	D	13/1	105.56
68	E	18/1	E	16/1	-
69	E	18/1	D	13/1	105.97
70	F	1/3	E	16/1	99.34
71	F	1/3	D	13/1	91.34
72	F	1/2	E	16/1	98.80
73	F	1/2	D	13/1	90.80
74	F	1/2	F	17/1	-
75	A	5/3	A	4/1	-
76	B	8/2	A	4/1	56.21
77	C	11/1	A	4/1	45.93
78	D	14/1	A	4/1	61.87

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 4: 2030 DM AM
1	B	8/1	C	10/1	26.12
2	C	11/1	D	13/1	2.88
3	B	8/1	D	13/1	26.12
4	A	5/3	F	17/1	31.46
5	B	8/2	B	6/2	16.48
6	B	8/2	F	17/1	11.35
7	C	11/1	F	17/1	2.88
8	B	8/2	A	4/2	16.48
9	C	11/1	B	6/2	-
10	D	14/1	F	17/1	22.95
11	C	11/1	A	4/2	-
12	D	14/1	F	17/1	22.95
13	C	11/1	E	16/1	2.88
14	C	11/1	C	10/1	-
15	D	14/1	E	16/1	22.95
16	D	14/1	B	6/2	31.18
18	D	14/1	A	4/2	31.18
19	E	18/1	A	4/1	34.70
20	A	5/3	A	4/2	-
21	C	11/1	B	6/1	-
23	E	18/1	A	4/2	34.73
24	E	18/1	F	17/1	26.79
25	F	1/2	A	4/2	33.54
26	D	14/1	B	6/1	31.18
27	E	18/1	B	6/1	34.73
28	F	1/2	B	6/1	-
29	A	5/2	E	16/1	31.65
30	A	5/2	D	13/1	31.65
31	C	11/1	F	17/1	2.88
32	B	8/2	B	6/1	-
33	B	8/1	E	16/1	26.12
34	A	5/2	F	17/1	-
35	D	14/1	D	13/1	-
36	D	14/1	C	10/1	56.90
37	F	1/3	F	17/1	54.45
38	E	18/1	B	6/2	34.73
39	F	1/2	A	4/1	32.87
40	E	18/1	D	13/1	-
41	E	18/1	C	10/1	60.69
42	F	1/2	B	6/2	-
43	F	1/2	D	13/1	59.84

Basic Results Summary

44	A	5/2	D	13/1	-
45	A	5/2	C	10/1	32.50
46	F	1/2	C	10/1	59.84
47	B	8/2	B	6/2	-
48	A	5/2	B	6/1	3.60
49	C	11/1	B	6/2	9.95
50	C	11/1	C	10/1	-
51	D	14/1	B	6/2	29.89
52	D	14/1	D	13/1	-
53	D	14/1	C	10/1	55.46
54	E	18/1	B	6/2	33.74
55	E	18/1	D	13/1	-
56	E	18/1	C	10/1	60.08
57	F	1/3	B	6/2	-
58	F	1/3	D	13/1	59.46
59	F	1/3	C	10/1	59.46
60	B	8/1	F	17/1	-
63	F	1/3	F	17/1	-
64	D	14/1	D	13/1	-
65	D	14/1	D	13/1	-
66	E	18/1	E	16/1	-
67	E	18/1	D	13/1	59.56
68	E	18/1	E	16/1	-
69	E	18/1	D	13/1	58.97
70	F	1/3	E	16/1	58.34
71	F	1/3	D	13/1	58.34
72	F	1/2	E	16/1	58.80
73	F	1/2	D	13/1	58.80
74	F	1/2	F	17/1	-
75	A	5/3	A	4/1	-
76	B	8/2	A	4/1	16.21
77	C	11/1	A	4/1	10.93
78	D	14/1	A	4/1	30.87

Basic Results Summary

Traffic Flows, Actual

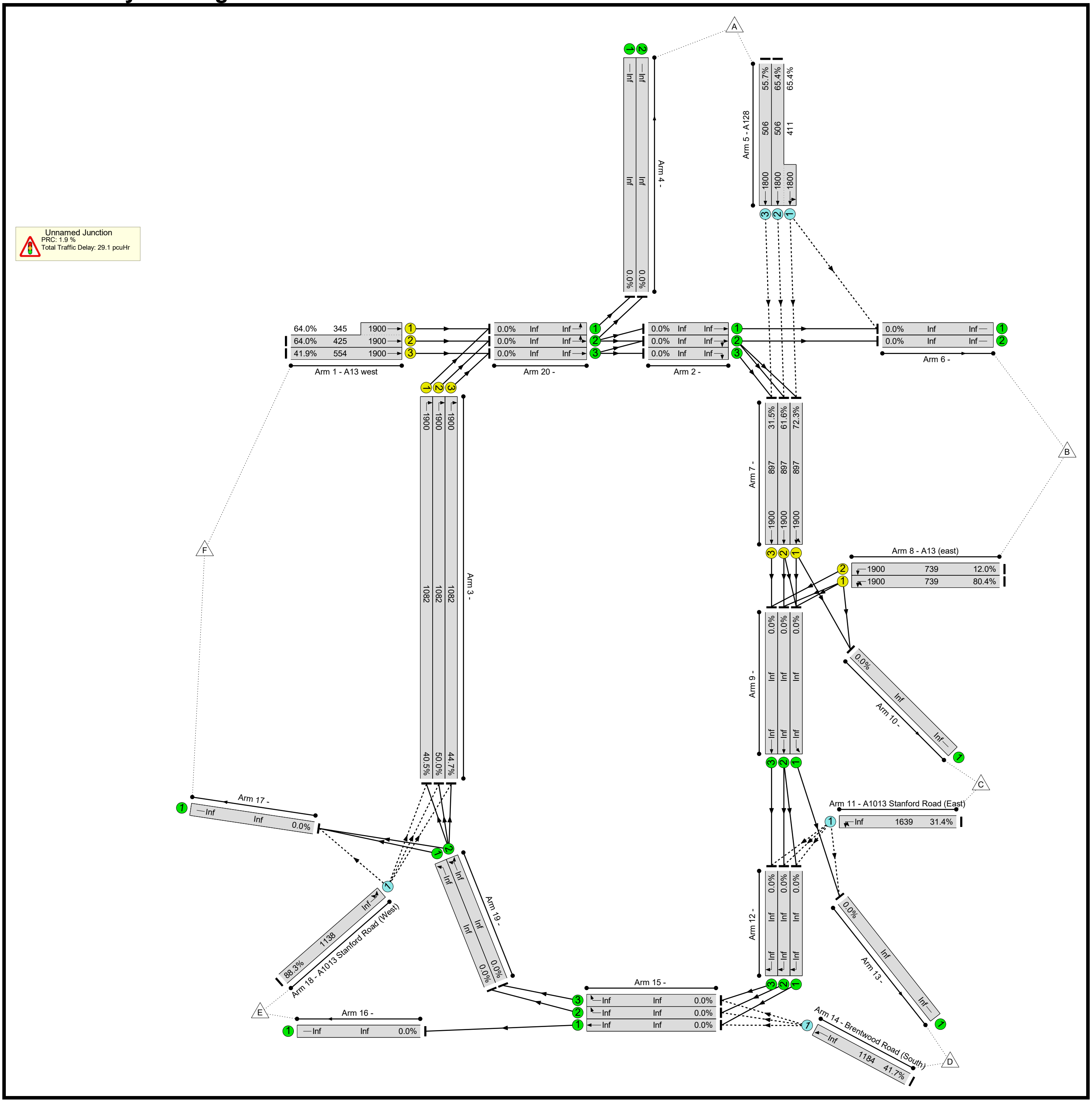
Actual Flow :

	Destination							
Origin		A	B	C	D	E	F	Tot.
	A	0	156	140	83	211	306	896
	B	138	1	16	168	636	1	960
	C	52	1	0	73	217	335	678
	D	254	282	41	0	148	134	859
	E	156	487	127	68	0	55	893
	F	320	0	148	65	25	15	573
	Tot.	920	927	472	457	1237	846	4859

Basic Results Summary

Scenario 5: '2030 DM PM' (FG5: '2030 LDO PM DM', 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: LTC Review	-	-	-		-	-	-	-	-	-	**88.3%**	**3495**	**0**	**0**	**29.1**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**88.3%**	**3495**	**0**	**0**	**29.1**	-	-
1/2+1/1	A13 west Ahead	U	A		1	20	-	493	1900:1900	425+345	64.0 : 64.0%	-	-	-	3.7	27.3	5.3
1/3	A13 west Ahead	U	A		1	20	-	232	1900	554	41.9%	-	-	-	1.7	26.2	4.1
3/1	Right	U	B		1	40	-	438	1900	1082	40.5%	-	-	-	1.7	14.0	6.0
3/2	Right	U	B		1	40	-	541	1900	1082	50.0%	-	-	-	1.9	12.8	7.0
3/3	Right	U	B		1	40	-	484	1900	1082	44.7%	-	-	-	1.6	12.0	5.9
5/2+5/1	A128 Left Ahead	O	-		-	-	-	600	1800:1800	506+411	65.4 : 65.4%	1200	0	0	1.0	6.0	2.5
5/3	A128 Ahead	O	-		-	-	-	282	1800	506	55.7%	282	0	0	0.7	8.4	1.7
7/1	Ahead Left	U	E		1	33	-	649	1900	897	72.3%	-	-	-	3.0	16.9	7.2
7/2	Ahead	U	E		1	33	-	553	1900	897	61.6%	-	-	-	2.7	17.5	7.8
7/3	Ahead	U	E		1	33	-	283	1900	897	31.5%	-	-	-	1.2	14.7	3.7
8/1	A13 (east) Left U-Turn	U	D		1	27	-	594	1900	739	80.4%	-	-	-	5.2	31.6	12.6
8/2	A13 (east) Left	U	D		1	27	-	89	1900	739	12.0%	-	-	-	0.4	16.9	1.2
11/1	A1013 Stanford Road (East) Left Left2	O	-		-	-	-	514	Inf	1639	31.4%	514	0	0	0.2	1.7	1.2
14/1	Brentwood Road (South) Ahead	O	-		-	-	-	494	Inf	1184	41.7%	494	0	0	0.4	2.6	0.4
18/1	A1013 Stanford Road (West) Left Left2	O	-		-	-	-	1005	Inf	1138	88.3%	1005	0	0	3.7	13.2	9.7

C1 Stream: 1 PRC for Signalled Lanes (%): 40.5 Total Delay for Signalled Lanes (pcuHr): 10.65 Cycle Time (s): 72
C1 Stream: 2 PRC for Signalled Lanes (%): 12.0 Total Delay for Signalled Lanes (pcuHr): 12.53 Cycle Time (s): 72
PRC Over All Lanes (%): 1.9 Total Delay Over All Lanes(pcuHr): 29.12

Basic Results Summary

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E	F
A	81.6	10.7	44.2	47.7	55.7	58.1
B	78.9	84.5	36.6	41.6	49.6	0.0
C	48.7	54.7	0.0	6.7	14.7	18.7
D	45.7	51.4	92.7	0.0	11.6	15.6
E	48.3	54.1	95.1	98.5	0.0	18.2
F	36.0	0.0	63.4	66.6	74.5	74.6

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E	F
A	28.6	5.7	26.2	24.7	24.7	23.1
B	38.9	39.5	31.6	31.6	31.6	0.0
C	13.7	13.7	0.0	1.7	1.7	1.7
D	14.7	14.9	43.2	0.0	2.6	2.6
E	25.3	25.5	53.5	52.5	0.0	13.2
F	27.0	0.0	35.9	34.1	34.0	30.6

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 5: 2030 DM PM
1	B	8/1	C	10/1	36.65
2	C	11/1	D	13/1	6.70
3	B	8/1	D	13/1	41.65
4	A	5/3	F	17/1	58.13
5	B	8/2	B	6/2	84.47
6	B	8/2	F	17/1	-
7	C	11/1	F	17/1	18.70
8	B	8/2	A	4/2	79.47
9	C	11/1	B	6/2	-
10	D	14/1	F	17/1	15.61
11	C	11/1	A	4/2	-
12	D	14/1	F	17/1	15.61
13	C	11/1	E	16/1	14.70
14	C	11/1	C	10/1	-
15	D	14/1	E	16/1	11.61
16	D	14/1	B	6/2	51.29
18	D	14/1	A	4/2	-
19	E	18/1	A	4/1	48.26
20	A	5/3	A	4/2	-
21	C	11/1	B	6/1	-
23	E	18/1	A	4/2	48.91
24	E	18/1	F	17/1	18.19
25	F	1/2	A	4/2	36.55
26	D	14/1	B	6/1	51.29
27	E	18/1	B	6/1	53.91
28	F	1/2	B	6/1	-
29	A	5/2	E	16/1	55.69
30	A	5/2	D	13/1	47.69
31	C	11/1	F	17/1	18.70
32	B	8/2	B	6/1	84.47
33	B	8/1	E	16/1	49.65
34	A	5/2	F	17/1	-
35	D	14/1	D	13/1	-
36	D	14/1	C	10/1	92.91
37	F	1/3	F	17/1	74.63
38	E	18/1	B	6/2	53.91
39	F	1/2	A	4/1	35.91
40	E	18/1	D	13/1	-
41	E	18/1	C	10/1	95.30
42	F	1/2	B	6/2	-
43	F	1/2	D	13/1	-

Basic Results Summary

44	A	5/2	D	13/1	-
45	A	5/2	C	10/1	44.17
46	F	1/2	C	10/1	63.38
47	B	8/2	B	6/2	-
48	A	5/2	B	6/1	10.67
49	C	11/1	B	6/2	54.67
50	C	11/1	C	10/1	-
51	D	14/1	B	6/2	51.58
52	D	14/1	D	13/1	-
53	D	14/1	C	10/1	92.51
54	E	18/1	B	6/2	54.19
55	E	18/1	D	13/1	99.90
56	E	18/1	C	10/1	94.90
57	F	1/3	B	6/2	-
58	F	1/3	D	13/1	68.49
59	F	1/3	C	10/1	63.49
60	B	8/1	F	17/1	-
63	F	1/3	F	17/1	-
64	D	14/1	D	13/1	-
65	D	14/1	D	13/1	-
66	E	18/1	E	16/1	-
67	E	18/1	D	13/1	98.50
68	E	18/1	E	16/1	-
69	E	18/1	D	13/1	-
70	F	1/3	E	16/1	74.56
71	F	1/3	D	13/1	66.56
72	F	1/2	E	16/1	74.49
73	F	1/2	D	13/1	66.49
74	F	1/2	F	17/1	-
75	A	5/3	A	4/1	81.60
76	B	8/2	A	4/1	78.89
77	C	11/1	A	4/1	48.75
78	D	14/1	A	4/1	45.65

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 5: 2030 DM PM
1	B	8/1	C	10/1	31.65
2	C	11/1	D	13/1	1.70
3	B	8/1	D	13/1	31.65
4	A	5/3	F	17/1	23.13
5	B	8/2	B	6/2	39.47
6	B	8/2	F	17/1	-
7	C	11/1	F	17/1	1.70
8	B	8/2	A	4/2	39.47
9	C	11/1	B	6/2	-
10	D	14/1	F	17/1	2.61
11	C	11/1	A	4/2	-
12	D	14/1	F	17/1	2.61
13	C	11/1	E	16/1	1.70
14	C	11/1	C	10/1	-
15	D	14/1	E	16/1	2.61
16	D	14/1	B	6/2	15.29
18	D	14/1	A	4/2	-
19	E	18/1	A	4/1	25.26
20	A	5/3	A	4/2	-
21	C	11/1	B	6/1	-
23	E	18/1	A	4/2	25.91
24	E	18/1	F	17/1	13.19
25	F	1/2	A	4/2	27.55
26	D	14/1	B	6/1	15.29
27	E	18/1	B	6/1	25.91
28	F	1/2	B	6/1	-
29	A	5/2	E	16/1	24.69
30	A	5/2	D	13/1	24.69
31	C	11/1	F	17/1	1.70
32	B	8/2	B	6/1	39.47
33	B	8/1	E	16/1	31.65
34	A	5/2	F	17/1	-
35	D	14/1	D	13/1	-
36	D	14/1	C	10/1	43.91
37	F	1/3	F	17/1	30.63
38	E	18/1	B	6/2	25.91
39	F	1/2	A	4/1	26.91
40	E	18/1	D	13/1	-
41	E	18/1	C	10/1	54.30
42	F	1/2	B	6/2	-
43	F	1/2	D	13/1	-

Basic Results Summary

44	A	5/2	D	13/1	-
45	A	5/2	C	10/1	26.17
46	F	1/2	C	10/1	36.38
47	B	8/2	B	6/2	-
48	A	5/2	B	6/1	5.67
49	C	11/1	B	6/2	13.67
50	C	11/1	C	10/1	-
51	D	14/1	B	6/2	14.58
52	D	14/1	D	13/1	-
53	D	14/1	C	10/1	42.51
54	E	18/1	B	6/2	25.19
55	E	18/1	D	13/1	52.90
56	E	18/1	C	10/1	52.90
57	F	1/3	B	6/2	-
58	F	1/3	D	13/1	35.49
59	F	1/3	C	10/1	35.49
60	B	8/1	F	17/1	-
63	F	1/3	F	17/1	-
64	D	14/1	D	13/1	-
65	D	14/1	D	13/1	-
66	E	18/1	E	16/1	-
67	E	18/1	D	13/1	52.50
68	E	18/1	E	16/1	-
69	E	18/1	D	13/1	-
70	F	1/3	E	16/1	33.56
71	F	1/3	D	13/1	33.56
72	F	1/2	E	16/1	34.49
73	F	1/2	D	13/1	34.49
74	F	1/2	F	17/1	-
75	A	5/3	A	4/1	28.60
76	B	8/2	A	4/1	38.89
77	C	11/1	A	4/1	13.75
78	D	14/1	A	4/1	14.65

Traffic Flows, Actual

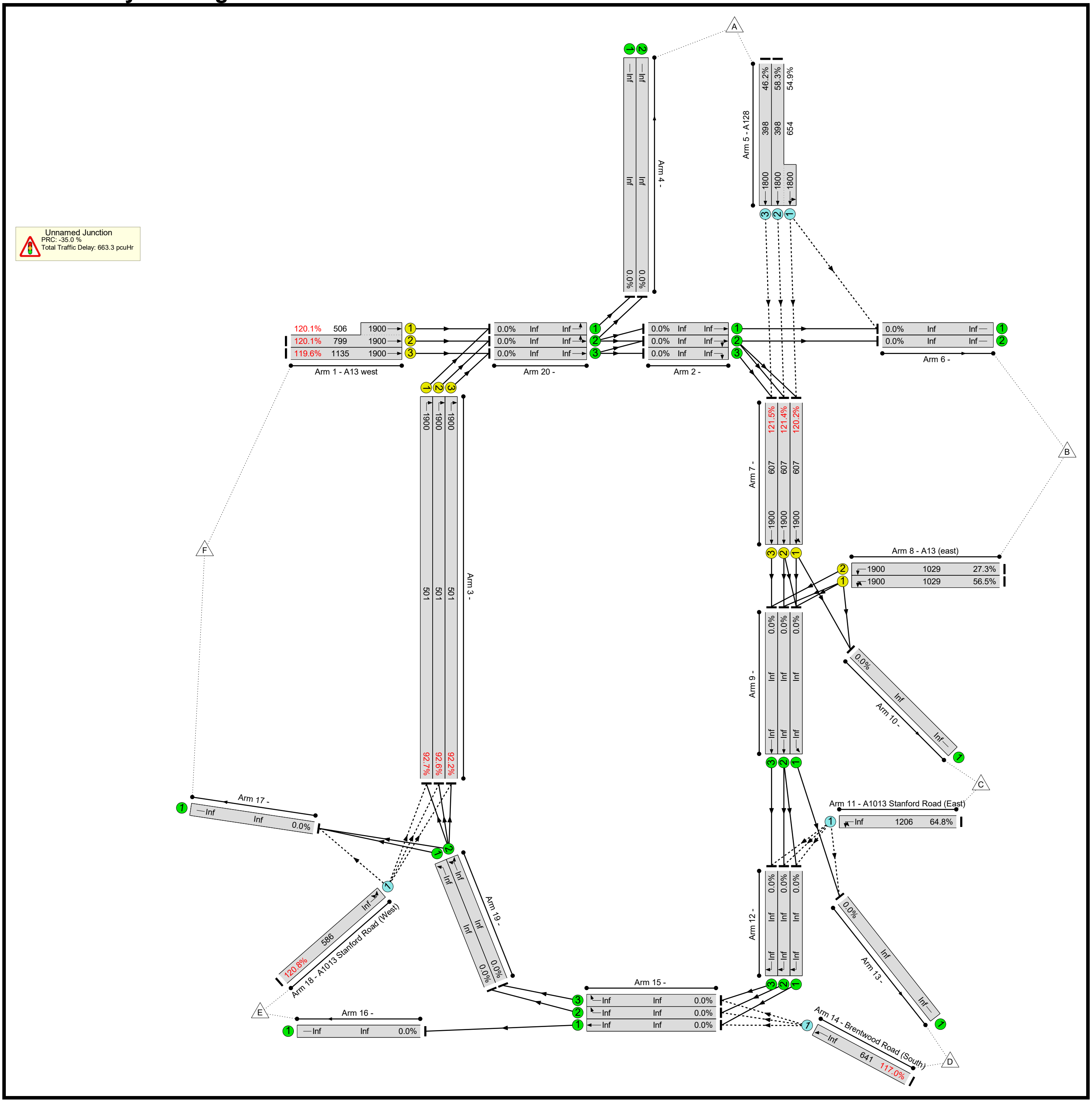
Actual Flow :

		Destination						
		A	B	C	D	E	F	Tot.
Origin	A	3	145	124	167	164	279	882
	B	87	2	23	203	368	0	683
	C	24	1	0	68	154	267	514
	D	46	316	17	0	43	72	494
	E	283	406	174	104	0	38	1005
	F	272	0	327	107	18	1	725
	Tot.	715	870	665	649	747	657	4303

Basic Results Summary

Scenario 6: '2030 DS pAM' (FG6: '2030 LDO pAM DS', 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: LTC Review	-	-	-		-	-	-	-	-	-	**121.5%**	**3374**	**0**	**0**	**663.3**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**121.5%**	**3374**	**0**	**0**	**663.3**	-	-
1/2+1/1	A13 west Ahead	U	A		1	42	-	1568	1900:1900	799+506	120.1 : 120.1%	-	-	-	147.6	338.9	169.3
1/3	A13 west Ahead	U	A		1	42	-	1357	1900	1135	119.6%	-	-	-	126.4	335.2	145.7
3/1	Right	U	B		1	18	-	514	1900	501	92.7%	-	-	-	7.6	59.1	14.2
3/2	Right	U	B		1	18	-	523	1900	501	92.6%	-	-	-	7.3	56.8	14.1
3/3	Right	U	B		1	18	-	550	1900	501	92.2%	-	-	-	7.1	55.1	13.8
5/2+5/1	A128 Left Ahead	O	-		-	-	-	591	1800:1800	398+654	58.3 : 54.9%	1182	0	0	0.6	3.9	0.6
5/3	A128 Ahead	O	-		-	-	-	184	1800	398	46.2%	184	0	0	0.4	8.4	0.4
7/1	Ahead Left	U	E		1	22	-	824	1900	607	120.2%	-	-	-	73.2	361.0	82.9
7/2	Ahead	U	E		1	22	-	837	1900	607	121.4%	-	-	-	76.4	373.6	86.6
7/3	Ahead	U	E		1	22	-	846	1900	607	121.5%	-	-	-	76.7	374.3	87.1
8/1	A13 (east) Left U-Turn	U	D		1	38	-	581	1900	1029	56.5%	-	-	-	2.4	14.9	8.2
8/2	A13 (east) Left	U	D		1	38	-	281	1900	1029	27.3%	-	-	-	0.9	11.3	3.2
11/1	A1013 Stanford Road (East) Left Left2	O	-		-	-	-	781	Inf	1206	64.8%	781	0	0	2.7	12.5	11.8
14/1	Brentwood Road (South) Ahead	O	-		-	-	-	750	Inf	641	117.0%	641	0	0	63.5	304.7	90.8
18/1	A1013 Stanford Road (West) Left Left2	O	-		-	-	-	708	Inf	586	120.8%	586	0	0	70.4	357.9	106.3

Basic Results Summary

C1	Stream: 1 PRC for Signalled Lanes (%):	-33.4	Total Delay for Signalled Lanes (pcuHr):	296.04	Cycle Time (s):	72
C1	Stream: 2 PRC for Signalled Lanes (%):	-35.0	Total Delay for Signalled Lanes (pcuHr):	229.59	Cycle Time (s):	72
	PRC Over All Lanes (%):	-35.0	Total Delay Over All Lanes(pcuHr):	663.26		

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E	F
A	0.0	8.9	382.2	388.3	407.9	414.8
B	113.4	117.5	19.9	24.9	32.9	33.3
C	105.4	109.2	0.0	17.5	25.5	29.5
D	390.9	394.8	764.4	0.0	313.7	317.7
E	438.4	442.8	811.1	818.1	837.0	362.9
F	347.9	0.0	726.2	733.4	751.8	754.6

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E	F
A	0.0	3.9	364.2	365.3	376.9	379.8
B	73.4	71.9	14.9	14.9	14.9	11.3
C	70.4	68.2	0.0	12.5	12.5	12.5
D	359.9	358.0	714.6	0.0	304.7	304.7
E	415.4	414.1	769.3	771.5	782.1	357.9
F	338.9	0.0	698.4	700.7	710.9	710.4

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 6: 2030 DS pAM
1	B	8/1	C	10/1	19.90
2	C	11/1	D	13/1	17.51
3	B	8/1	D	13/1	24.90
4	A	5/3	F	17/1	416.88
5	B	8/2	B	6/2	117.78
6	B	8/2	F	17/1	33.29
7	C	11/1	F	17/1	29.51
8	B	8/2	A	4/2	112.78
9	C	11/1	B	6/2	-
10	D	14/1	F	17/1	317.68
11	C	11/1	A	4/2	104.83
12	D	14/1	F	17/1	317.68
13	C	11/1	E	16/1	25.51
14	C	11/1	C	10/1	-
15	D	14/1	E	16/1	313.68
16	D	14/1	B	6/2	395.34
18	D	14/1	A	4/2	390.34
19	E	18/1	A	4/1	440.06
20	A	5/3	A	4/2	-
21	C	11/1	B	6/1	-
23	E	18/1	A	4/2	435.76
24	E	18/1	F	17/1	362.90
25	F	1/2	A	4/2	348.11
26	D	14/1	B	6/1	395.34
27	E	18/1	B	6/1	440.76
28	F	1/2	B	6/1	-
29	A	5/2	E	16/1	407.93
30	A	5/2	D	13/1	399.93
31	C	11/1	F	17/1	29.51
32	B	8/2	B	6/1	117.78
33	B	8/1	E	16/1	32.90
34	A	5/2	F	17/1	411.93
35	D	14/1	D	13/1	-
36	D	14/1	C	10/1	764.40
37	F	1/3	F	17/1	753.80
38	E	18/1	B	6/2	440.76
39	F	1/2	A	4/1	347.65
40	E	18/1	D	13/1	815.03
41	E	18/1	C	10/1	810.03
42	F	1/2	B	6/2	-
43	F	1/2	D	13/1	731.23

Basic Results Summary

44	A	5/2	D	13/1	387.17
45	A	5/2	C	10/1	382.17
46	F	1/2	C	10/1	726.23
47	B	8/2	B	6/2	117.39
48	A	5/2	B	6/1	8.89
49	C	11/1	B	6/2	109.22
50	C	11/1	C	10/1	-
51	D	14/1	B	6/2	394.68
52	D	14/1	D	13/1	-
53	D	14/1	C	10/1	764.38
54	E	18/1	B	6/2	443.52
55	E	18/1	D	13/1	816.31
56	E	18/1	C	10/1	811.31
57	F	1/3	B	6/2	-
58	F	1/3	D	13/1	731.17
59	F	1/3	C	10/1	726.17
60	B	8/1	F	17/1	-
63	F	1/3	F	17/1	755.76
64	D	14/1	D	13/1	-
65	D	14/1	D	13/1	-
66	E	18/1	E	16/1	836.04
67	E	18/1	D	13/1	828.04
68	E	18/1	E	16/1	837.11
69	E	18/1	D	13/1	829.11
70	F	1/3	E	16/1	751.76
71	F	1/3	D	13/1	743.76
72	F	1/2	E	16/1	751.70
73	F	1/2	D	13/1	743.70
74	F	1/2	F	17/1	755.70
75	A	5/3	A	4/1	-
76	B	8/2	A	4/1	113.90
77	C	11/1	A	4/1	105.89
78	D	14/1	A	4/1	391.28

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 6: 2030 DS pAM
1	B	8/1	C	10/1	14.90
2	C	11/1	D	13/1	12.51
3	B	8/1	D	13/1	14.90
4	A	5/3	F	17/1	381.88
5	B	8/2	B	6/2	72.78
6	B	8/2	F	17/1	11.29
7	C	11/1	F	17/1	12.51
8	B	8/2	A	4/2	72.78
9	C	11/1	B	6/2	-
10	D	14/1	F	17/1	304.68
11	C	11/1	A	4/2	69.83
12	D	14/1	F	17/1	304.68
13	C	11/1	E	16/1	12.51
14	C	11/1	C	10/1	-
15	D	14/1	E	16/1	304.68
16	D	14/1	B	6/2	359.34
18	D	14/1	A	4/2	359.34
19	E	18/1	A	4/1	417.06
20	A	5/3	A	4/2	-
21	C	11/1	B	6/1	-
23	E	18/1	A	4/2	412.76
24	E	18/1	F	17/1	357.90
25	F	1/2	A	4/2	339.11
26	D	14/1	B	6/1	359.34
27	E	18/1	B	6/1	412.76
28	F	1/2	B	6/1	-
29	A	5/2	E	16/1	376.93
30	A	5/2	D	13/1	376.93
31	C	11/1	F	17/1	12.51
32	B	8/2	B	6/1	72.78
33	B	8/1	E	16/1	14.90
34	A	5/2	F	17/1	376.93
35	D	14/1	D	13/1	-
36	D	14/1	C	10/1	715.40
37	F	1/3	F	17/1	709.80
38	E	18/1	B	6/2	412.76
39	F	1/2	A	4/1	338.65
40	E	18/1	D	13/1	769.03
41	E	18/1	C	10/1	769.03
42	F	1/2	B	6/2	-
43	F	1/2	D	13/1	699.23

Basic Results Summary

44	A	5/2	D	13/1	364.17
45	A	5/2	C	10/1	364.17
46	F	1/2	C	10/1	699.23
47	B	8/2	B	6/2	71.39
48	A	5/2	B	6/1	3.89
49	C	11/1	B	6/2	68.22
50	C	11/1	C	10/1	-
51	D	14/1	B	6/2	357.68
52	D	14/1	D	13/1	-
53	D	14/1	C	10/1	714.38
54	E	18/1	B	6/2	414.52
55	E	18/1	D	13/1	769.31
56	E	18/1	C	10/1	769.31
57	F	1/3	B	6/2	-
58	F	1/3	D	13/1	698.17
59	F	1/3	C	10/1	698.17
60	B	8/1	F	17/1	-
63	F	1/3	F	17/1	710.76
64	D	14/1	D	13/1	-
65	D	14/1	D	13/1	-
66	E	18/1	E	16/1	782.04
67	E	18/1	D	13/1	782.04
68	E	18/1	E	16/1	782.11
69	E	18/1	D	13/1	782.11
70	F	1/3	E	16/1	710.76
71	F	1/3	D	13/1	710.76
72	F	1/2	E	16/1	711.70
73	F	1/2	D	13/1	711.70
74	F	1/2	F	17/1	711.70
75	A	5/3	A	4/1	-
76	B	8/2	A	4/1	73.90
77	C	11/1	A	4/1	70.89
78	D	14/1	A	4/1	360.28

Basic Results Summary

Traffic Flows, Actual

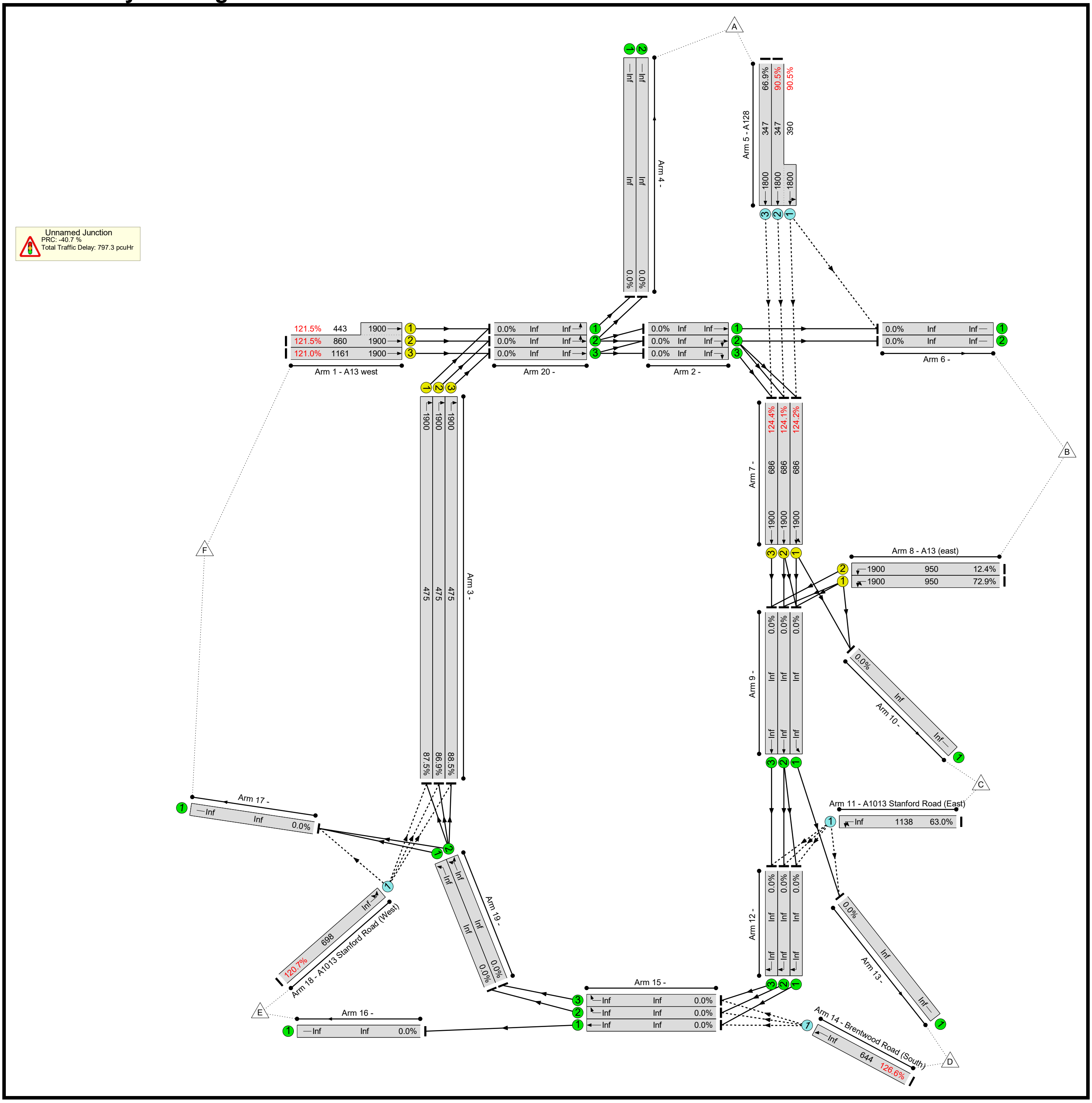
Actual Flow :

		Destination						
		A	B	C	D	E	F	Tot.
Origin	A	0	135	162	68	89	321	775
	B	272	5	10	165	406	4	862
	C	102	3	0	47	210	419	781
	D	257	245	39	0	74	135	750
	E	235	368	37	17	7	44	708
	F	1158	0	328	220	77	1142	2925
	Tot.	2024	756	576	517	863	2065	6801

Basic Results Summary

Scenario 7: '2030 DS AM' (FG7: '2030 LDO AM DS', 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: LTC Review	-	-	-		-	-	-	-	-	-	**126.6%**	**3626**	**0**	**0**	**797.3**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**126.6%**	**3626**	**0**	**0**	**797.3**	-	-
1/2+1/1	A13 west Ahead	U	A		1	43	-	1582	1900:1900	860+443	121.5 : 121.5%	-	-	-	156.5	356.1	179.0
1/3	A13 west Ahead	U	A		1	43	-	1405	1900	1161	121.0%	-	-	-	137.6	352.7	157.7
3/1	Right	U	B		1	17	-	482	1900	475	87.5%	-	-	-	7.1	61.4	11.1
3/2	Right	U	B		1	17	-	518	1900	475	86.9%	-	-	-	6.9	60.0	11.0
3/3	Right	U	B		1	17	-	513	1900	475	88.5%	-	-	-	7.1	60.7	11.6
5/2+5/1	A128 Left Ahead	O	-		-	-	-	667	1800:1800	347+390	90.5 : 90.5%	1334	0	0	4.4	23.6	7.8
5/3	A128 Ahead	O	-		-	-	-	232	1800	347	66.9%	232	0	0	1.0	15.6	1.8
7/1	Ahead Left	U	E		1	25	-	997	1900	686	124.2%	-	-	-	96.4	407.3	106.0
7/2	Ahead	U	E		1	25	-	967	1900	686	124.1%	-	-	-	96.1	406.3	105.4
7/3	Ahead	U	E		1	25	-	984	1900	686	124.4%	-	-	-	97.8	412.5	106.6
8/1	A13 (east) Left U-Turn	U	D		1	35	-	693	1900	950	72.9%	-	-	-	4.1	21.1	12.1
8/2	A13 (east) Left	U	D		1	35	-	118	1900	950	12.4%	-	-	-	0.4	11.8	1.3
11/1	A1013 Stanford Road (East) Left Left2	O	-		-	-	-	717	Inf	1138	63.0%	717	0	0	2.5	12.3	10.8
14/1	Brentwood Road (South) Ahead	O	-		-	-	-	816	Inf	644	126.6%	644	0	0	97.2	428.7	129.6
18/1	A1013 Stanford Road (West) Left Left2	O	-		-	-	-	843	Inf	698	120.7%	698	0	0	82.4	351.9	116.8

Basic Results Summary

C1	Stream: 1	PRC for Signalled Lanes (%):	-35.0	Total Delay for Signalled Lanes (pcuHr):	315.16	Cycle Time (s):	72
C1	Stream: 2	PRC for Signalled Lanes (%):	-38.2	Total Delay for Signalled Lanes (pcuHr):	294.73	Cycle Time (s):	72
		PRC Over All Lanes (%):	-40.7	Total Delay Over All Lanes(pcuHr):	797.30		

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E	F
A	0.0	28.1	447.6	452.7	460.7	463.8
B	118.4	125.9	26.1	31.1	39.1	33.8
C	110.8	118.2	0.0	17.3	25.3	29.3
D	518.4	523.9	942.5	0.0	437.7	441.7
E	434.8	441.4	859.2	865.4	0.0	356.9
F	364.9	0.0	789.9	794.3	801.1	807.9

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E	F
A	0.0	23.1	429.6	429.7	429.7	428.8
B	78.4	79.9	21.1	21.1	21.1	11.8
C	75.8	77.2	0.0	12.3	12.3	12.3
D	487.4	487.4	893.0	0.0	428.7	428.7
E	411.8	412.8	817.7	818.8	0.0	351.9
F	355.9	0.0	762.2	761.7	760.4	763.7

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 7: 2030 DS AM
1	B	8/1	C	10/1	26.10
2	C	11/1	D	13/1	17.31
3	B	8/1	D	13/1	31.10
4	A	5/3	F	17/1	463.58
5	B	8/2	B	6/2	-
6	B	8/2	F	17/1	33.78
7	C	11/1	F	17/1	29.31
8	B	8/2	A	4/2	117.17
9	C	11/1	B	6/2	-
10	D	14/1	F	17/1	441.71
11	C	11/1	A	4/2	109.57
12	D	14/1	F	17/1	441.71
13	C	11/1	E	16/1	25.31
14	C	11/1	C	10/1	-
15	D	14/1	E	16/1	437.71
16	D	14/1	B	6/2	522.21
18	D	14/1	A	4/2	517.21
19	E	18/1	A	4/1	434.71
20	A	5/3	A	4/2	-
21	C	11/1	B	6/1	-
23	E	18/1	A	4/2	435.79
24	E	18/1	F	17/1	356.91
25	F	1/2	A	4/2	365.24
26	D	14/1	B	6/1	522.21
27	E	18/1	B	6/1	440.79
28	F	1/2	B	6/1	-
29	A	5/2	E	16/1	460.68
30	A	5/2	D	13/1	452.68
31	C	11/1	F	17/1	29.31
32	B	8/2	B	6/1	-
33	B	8/1	E	16/1	39.10
34	A	5/2	F	17/1	464.68
35	D	14/1	D	13/1	-
36	D	14/1	C	10/1	940.52
37	F	1/3	F	17/1	808.98
38	E	18/1	B	6/2	440.79
39	F	1/2	A	4/1	364.69
40	E	18/1	D	13/1	863.03
41	E	18/1	C	10/1	858.03
42	F	1/2	B	6/2	-
43	F	1/2	D	13/1	797.39

Basic Results Summary

44	A	5/2	D	13/1	452.65
45	A	5/2	C	10/1	447.65
46	F	1/2	C	10/1	792.39
47	B	8/2	B	6/2	125.88
48	A	5/2	B	6/1	28.09
49	C	11/1	B	6/2	118.16
50	C	11/1	C	10/1	-
51	D	14/1	B	6/2	525.72
52	D	14/1	D	13/1	-
53	D	14/1	C	10/1	944.21
54	E	18/1	B	6/2	441.90
55	E	18/1	D	13/1	865.13
56	E	18/1	C	10/1	860.13
57	F	1/3	B	6/2	-
58	F	1/3	D	13/1	793.74
59	F	1/3	C	10/1	788.74
60	B	8/1	F	17/1	-
63	F	1/3	F	17/1	804.12
64	D	14/1	D	13/1	-
65	D	14/1	D	13/1	-
66	E	18/1	E	16/1	-
67	E	18/1	D	13/1	867.31
68	E	18/1	E	16/1	-
69	E	18/1	D	13/1	868.27
70	F	1/3	E	16/1	800.12
71	F	1/3	D	13/1	792.12
72	F	1/2	E	16/1	803.02
73	F	1/2	D	13/1	795.02
74	F	1/2	F	17/1	807.02
75	A	5/3	A	4/1	-
76	B	8/2	A	4/1	118.70
77	C	11/1	A	4/1	111.06
78	D	14/1	A	4/1	518.52

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 7: 2030 DS AM
1	B	8/1	C	10/1	21.10
2	C	11/1	D	13/1	12.31
3	B	8/1	D	13/1	21.10
4	A	5/3	F	17/1	428.58
5	B	8/2	B	6/2	-
6	B	8/2	F	17/1	11.78
7	C	11/1	F	17/1	12.31
8	B	8/2	A	4/2	77.17
9	C	11/1	B	6/2	-
10	D	14/1	F	17/1	428.71
11	C	11/1	A	4/2	74.57
12	D	14/1	F	17/1	428.71
13	C	11/1	E	16/1	12.31
14	C	11/1	C	10/1	-
15	D	14/1	E	16/1	428.71
16	D	14/1	B	6/2	486.21
18	D	14/1	A	4/2	486.21
19	E	18/1	A	4/1	411.71
20	A	5/3	A	4/2	-
21	C	11/1	B	6/1	-
23	E	18/1	A	4/2	412.79
24	E	18/1	F	17/1	351.91
25	F	1/2	A	4/2	356.24
26	D	14/1	B	6/1	486.21
27	E	18/1	B	6/1	412.79
28	F	1/2	B	6/1	-
29	A	5/2	E	16/1	429.68
30	A	5/2	D	13/1	429.68
31	C	11/1	F	17/1	12.31
32	B	8/2	B	6/1	-
33	B	8/1	E	16/1	21.10
34	A	5/2	F	17/1	429.68
35	D	14/1	D	13/1	-
36	D	14/1	C	10/1	891.52
37	F	1/3	F	17/1	764.98
38	E	18/1	B	6/2	412.79
39	F	1/2	A	4/1	355.69
40	E	18/1	D	13/1	817.03
41	E	18/1	C	10/1	817.03
42	F	1/2	B	6/2	-
43	F	1/2	D	13/1	765.39

Basic Results Summary

44	A	5/2	D	13/1	429.65
45	A	5/2	C	10/1	429.65
46	F	1/2	C	10/1	765.39
47	B	8/2	B	6/2	79.88
48	A	5/2	B	6/1	23.09
49	C	11/1	B	6/2	77.16
50	C	11/1	C	10/1	-
51	D	14/1	B	6/2	488.72
52	D	14/1	D	13/1	-
53	D	14/1	C	10/1	894.21
54	E	18/1	B	6/2	412.90
55	E	18/1	D	13/1	818.13
56	E	18/1	C	10/1	818.13
57	F	1/3	B	6/2	-
58	F	1/3	D	13/1	760.74
59	F	1/3	C	10/1	760.74
60	B	8/1	F	17/1	-
63	F	1/3	F	17/1	759.12
64	D	14/1	D	13/1	-
65	D	14/1	D	13/1	-
66	E	18/1	E	16/1	-
67	E	18/1	D	13/1	821.31
68	E	18/1	E	16/1	-
69	E	18/1	D	13/1	821.27
70	F	1/3	E	16/1	759.12
71	F	1/3	D	13/1	759.12
72	F	1/2	E	16/1	763.02
73	F	1/2	D	13/1	763.02
74	F	1/2	F	17/1	763.02
75	A	5/3	A	4/1	-
76	B	8/2	A	4/1	78.70
77	C	11/1	A	4/1	76.06
78	D	14/1	A	4/1	487.52

Traffic Flows, Actual

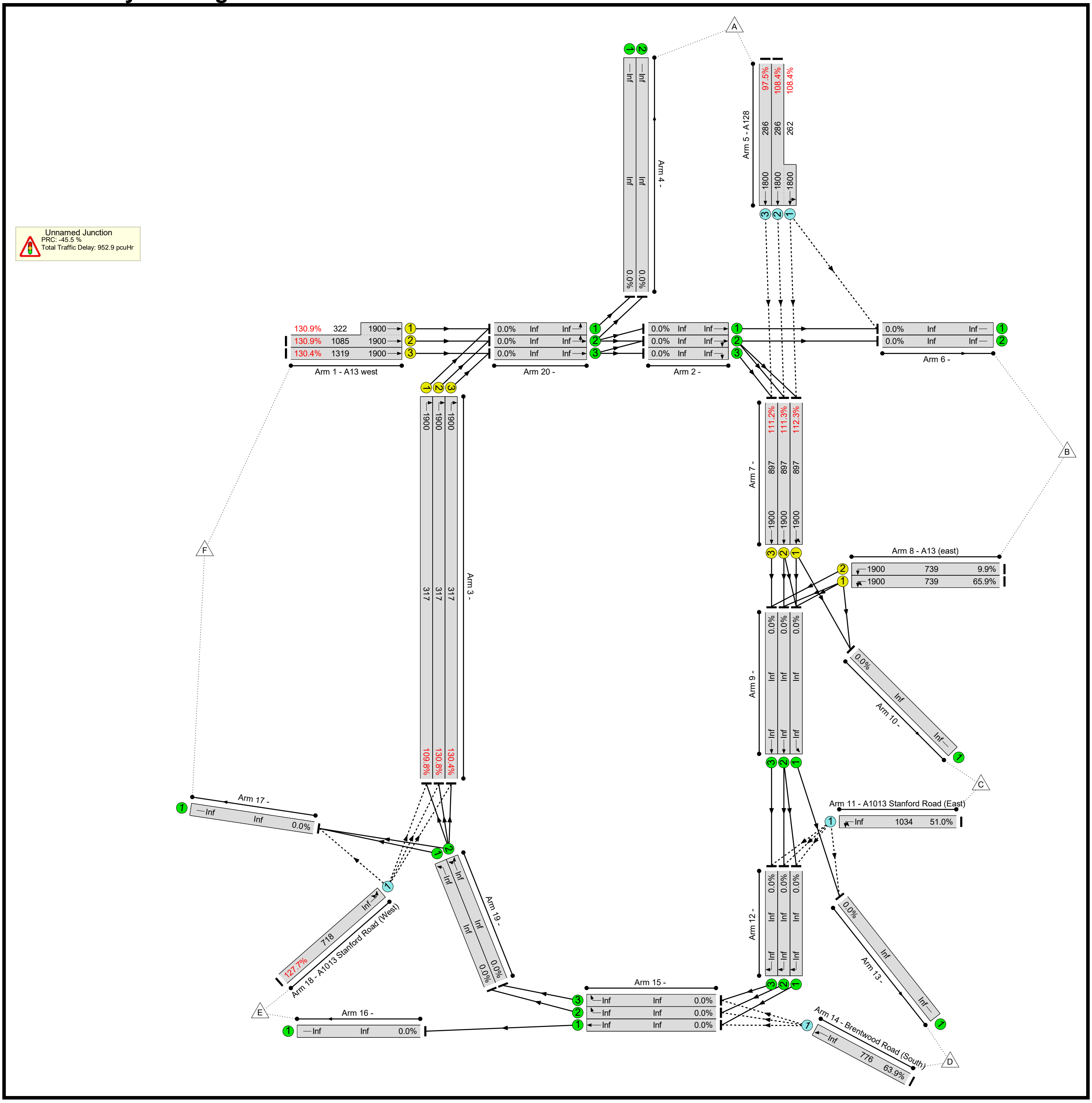
Actual Flow :

		Destination						
		A	B	C	D	E	F	Tot.
Origin	A	0	156	141	83	212	307	899
	B	116	1	13	142	538	1	811
	C	55	1	0	78	229	354	717
	D	242	268	39	0	140	127	816
	E	147	459	120	65	0	52	843
	F	1006	0	465	205	80	1231	2987
	Tot.	1566	885	778	573	1199	2072	7073

Basic Results Summary

Scenario 8: '2030 DS PM' (FG8: '2030 LDO PM DS', 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: LTC Review	-	-	-		-	-	-	-	-	-	**130.9%**	**3160**	**0**	**0**	**952.9**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**130.9%**	**3160**	**0**	**0**	**952.9**	-	-
1/2+1/1	A13 west Ahead	U	A		1	49	-	1841	1900:1900	1085+322	130.9 : 130.9%	-	-	-	239.6	468.5	267.7
1/3	A13 west Ahead	U	A		1	49	-	1720	1900	1319	130.4%	-	-	-	223.2	467.2	248.5
3/1	Right	U	B		1	11	-	404	1900	317	109.8%	-	-	-	23.4	241.9	27.4
3/2	Right	U	B		1	11	-	481	1900	317	130.8%	-	-	-	57.5	499.9	61.4
3/3	Right	U	B		1	11	-	481	1900	317	130.4%	-	-	-	56.9	496.4	60.8
5/2+5/1	A128 Left Ahead	O	-		-	-	-	594	1800:1800	286+262	108.4 : 108.4%	1140	0	0	29.6	179.6	45.9
5/3	A128 Ahead	O	-		-	-	-	279	1800	286	97.5%	279	0	0	7.0	90.5	10.8
7/1	Ahead Left	U	E		1	33	-	1319	1900	897	112.3%	-	-	-	68.6	245.0	81.8
7/2	Ahead	U	E		1	33	-	1261	1900	897	111.3%	-	-	-	63.6	229.4	77.1
7/3	Ahead	U	E		1	33	-	1216	1900	897	111.2%	-	-	-	63.2	227.9	76.8
8/1	A13 (east) Left U-Turn	U	D		1	27	-	487	1900	739	65.9%	-	-	-	3.4	25.2	8.9
8/2	A13 (east) Left	U	D		1	27	-	73	1900	739	9.9%	-	-	-	0.3	16.7	1.0
11/1	A1013 Stanford Road (East) Left Left2	O	-		-	-	-	527	Inf	1034	51.0%	527	0	0	1.9	13.1	7.7
14/1	Brentwood Road (South) Ahead	O	-		-	-	-	496	Inf	776	63.9%	496	0	0	1.0	7.2	6.3
18/1	A1013 Stanford Road (West) Left Left2	O	-		-	-	-	917	Inf	718	127.7%	718	0	0	113.6	446.0	156.6

Basic Results Summary

C1	Stream: 1 PRC for Signalled Lanes (%):	-45.5	Total Delay for Signalled Lanes (pcuHr):	600.56	Cycle Time (s):	72
C1	Stream: 2 PRC for Signalled Lanes (%):	-24.8	Total Delay for Signalled Lanes (pcuHr):	199.12	Cycle Time (s):	72
	PRC Over All Lanes (%):	-45.5	Total Delay Over All Lanes(pcuHr):	952.86		

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E	F
A	625.3	175.9	435.4	442.8	451.1	357.8
B	288.8	553.7	30.2	35.2	43.2	0.0
C	285.0	552.4	0.0	18.1	26.1	30.1
D	280.5	538.3	803.4	0.0	16.2	20.2
E	714.8	975.1	1241.1	1234.5	0.0	451.0
F	477.3	0.0	738.9	731.2	736.1	738.4

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E	F
A	572.3	170.9	417.4	419.8	420.1	322.8
B	248.8	508.7	25.2	25.2	25.2	0.0
C	250.0	511.4	0.0	13.1	13.1	13.1
D	249.5	501.8	753.9	0.0	7.2	7.2
E	691.8	946.6	1199.6	1188.0	0.0	446.0
F	468.3	0.0	711.3	698.8	695.5	694.4

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 8: 2030 DS PM
1	B	8/1	C	10/1	30.17
2	C	11/1	D	13/1	18.12
3	B	8/1	D	13/1	35.17
4	A	5/3	F	17/1	357.79
5	B	8/2	B	6/2	553.65
6	B	8/2	F	17/1	-
7	C	11/1	F	17/1	30.12
8	B	8/2	A	4/2	-
9	C	11/1	B	6/2	-
10	D	14/1	F	17/1	20.20
11	C	11/1	A	4/2	-
12	D	14/1	F	17/1	20.20
13	C	11/1	E	16/1	26.12
14	C	11/1	C	10/1	-
15	D	14/1	E	16/1	16.20
16	D	14/1	B	6/2	539.16
18	D	14/1	A	4/2	-
19	E	18/1	A	4/1	714.77
20	A	5/3	A	4/2	-
21	C	11/1	B	6/1	-
23	E	18/1	A	4/2	-
24	E	18/1	F	17/1	451.01
25	F	1/2	A	4/2	477.60
26	D	14/1	B	6/1	539.16
27	E	18/1	B	6/1	976.69
28	F	1/2	B	6/1	-
29	A	5/2	E	16/1	451.08
30	A	5/2	D	13/1	443.08
31	C	11/1	F	17/1	30.12
32	B	8/2	B	6/1	553.65
33	B	8/1	E	16/1	43.17
34	A	5/2	F	17/1	-
35	D	14/1	D	13/1	-
36	D	14/1	C	10/1	804.81
37	F	1/3	F	17/1	737.42
38	E	18/1	B	6/2	976.69
39	F	1/2	A	4/1	477.01
40	E	18/1	D	13/1	1248.04
41	E	18/1	C	10/1	1243.04
42	F	1/2	B	6/2	-
43	F	1/2	D	13/1	743.92

Basic Results Summary

44	A	5/2	D	13/1	440.41
45	A	5/2	C	10/1	435.41
46	F	1/2	C	10/1	738.92
47	B	8/2	B	6/2	-
48	A	5/2	B	6/1	175.94
49	C	11/1	B	6/2	552.38
50	C	11/1	C	10/1	-
51	D	14/1	B	6/2	537.36
52	D	14/1	D	13/1	-
53	D	14/1	C	10/1	802.05
54	E	18/1	B	6/2	973.54
55	E	18/1	D	13/1	1244.11
56	E	18/1	C	10/1	1239.11
57	F	1/3	B	6/2	-
58	F	1/3	D	13/1	743.92
59	F	1/3	C	10/1	738.92
60	B	8/1	F	17/1	-
63	F	1/3	F	17/1	740.03
64	D	14/1	D	13/1	-
65	D	14/1	D	13/1	-
66	E	18/1	E	16/1	-
67	E	18/1	D	13/1	1233.33
68	E	18/1	E	16/1	-
69	E	18/1	D	13/1	1229.34
70	F	1/3	E	16/1	736.03
71	F	1/3	D	13/1	728.03
72	F	1/2	E	16/1	736.11
73	F	1/2	D	13/1	728.11
74	F	1/2	F	17/1	740.11
75	A	5/3	A	4/1	625.32
76	B	8/2	A	4/1	288.79
77	C	11/1	A	4/1	285.05
78	D	14/1	A	4/1	280.53

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 8: 2030 DS PM
1	B	8/1	C	10/1	25.17
2	C	11/1	D	13/1	13.12
3	B	8/1	D	13/1	25.17
4	A	5/3	F	17/1	322.79
5	B	8/2	B	6/2	508.65
6	B	8/2	F	17/1	-
7	C	11/1	F	17/1	13.12
8	B	8/2	A	4/2	-
9	C	11/1	B	6/2	-
10	D	14/1	F	17/1	7.20
11	C	11/1	A	4/2	-
12	D	14/1	F	17/1	7.20
13	C	11/1	E	16/1	13.12
14	C	11/1	C	10/1	-
15	D	14/1	E	16/1	7.20
16	D	14/1	B	6/2	503.16
18	D	14/1	A	4/2	-
19	E	18/1	A	4/1	691.77
20	A	5/3	A	4/2	-
21	C	11/1	B	6/1	-
23	E	18/1	A	4/2	-
24	E	18/1	F	17/1	446.01
25	F	1/2	A	4/2	468.60
26	D	14/1	B	6/1	503.16
27	E	18/1	B	6/1	948.69
28	F	1/2	B	6/1	-
29	A	5/2	E	16/1	420.08
30	A	5/2	D	13/1	420.08
31	C	11/1	F	17/1	13.12
32	B	8/2	B	6/1	508.65
33	B	8/1	E	16/1	25.17
34	A	5/2	F	17/1	-
35	D	14/1	D	13/1	-
36	D	14/1	C	10/1	755.81
37	F	1/3	F	17/1	693.42
38	E	18/1	B	6/2	948.69
39	F	1/2	A	4/1	468.01
40	E	18/1	D	13/1	1202.04
41	E	18/1	C	10/1	1202.04
42	F	1/2	B	6/2	-
43	F	1/2	D	13/1	711.92

Basic Results Summary

44	A	5/2	D	13/1	417.41
45	A	5/2	C	10/1	417.41
46	F	1/2	C	10/1	711.92
47	B	8/2	B	6/2	-
48	A	5/2	B	6/1	170.94
49	C	11/1	B	6/2	511.38
50	C	11/1	C	10/1	-
51	D	14/1	B	6/2	500.36
52	D	14/1	D	13/1	-
53	D	14/1	C	10/1	752.05
54	E	18/1	B	6/2	944.54
55	E	18/1	D	13/1	1197.11
56	E	18/1	C	10/1	1197.11
57	F	1/3	B	6/2	-
58	F	1/3	D	13/1	710.92
59	F	1/3	C	10/1	710.92
60	B	8/1	F	17/1	-
63	F	1/3	F	17/1	695.03
64	D	14/1	D	13/1	-
65	D	14/1	D	13/1	-
66	E	18/1	E	16/1	-
67	E	18/1	D	13/1	1187.33
68	E	18/1	E	16/1	-
69	E	18/1	D	13/1	1182.34
70	F	1/3	E	16/1	695.03
71	F	1/3	D	13/1	695.03
72	F	1/2	E	16/1	696.11
73	F	1/2	D	13/1	696.11
74	F	1/2	F	17/1	696.11
75	A	5/3	A	4/1	572.32
76	B	8/2	A	4/1	248.79
77	C	11/1	A	4/1	250.05
78	D	14/1	A	4/1	249.53

Basic Results Summary

Traffic Flows, Actual

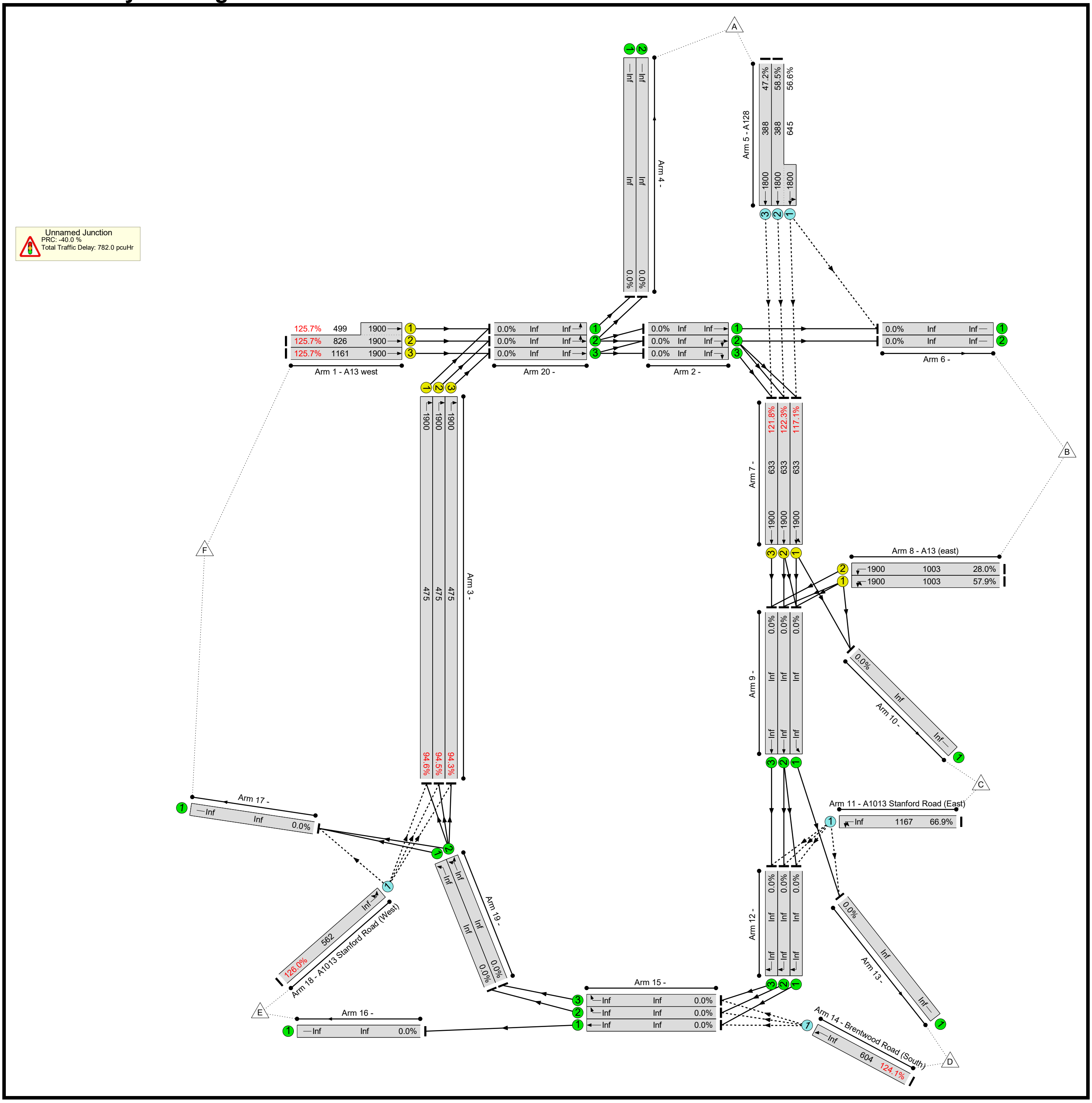
Actual Flow :

	Destination							
Origin		A	B	C	D	E	F	Tot.
	A	3	144	123	165	162	276	873
	B	71	2	19	166	302	0	560
	C	25	1	0	70	158	273	527
	D	46	317	18	0	43	72	496
	E	259	370	159	95	0	34	917
	F	766	0	921	302	50	1522	3561
	Tot.	1170	834	1240	798	715	2177	6934

Basic Results Summary

Scenario 9: '2030 DS pAM DCC' (FG9: 'Dartford Closure 2030 LDO pAM DS', 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: LTC Review	-	-	-		-	-	-	-	-	-	**126.0%**	**3314**	**0**	**0**	**782.0**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**126.0%**	**3314**	**0**	**0**	**782.0**	-	-
1/2+1/1	A13 west Ahead	U	A		1	43	-	1665	1900:1900	826+499	125.7 : 125.7%	-	-	-	188.6	407.7	211.5
1/3	A13 west Ahead	U	A		1	43	-	1460	1900	1161	125.7%	-	-	-	166.6	410.8	187.0
3/1	Right	U	B		1	17	-	510	1900	475	94.6%	-	-	-	8.9	71.0	14.9
3/2	Right	U	B		1	17	-	519	1900	475	94.5%	-	-	-	8.6	69.1	14.8
3/3	Right	U	B		1	17	-	558	1900	475	94.3%	-	-	-	8.3	66.9	14.7
5/2+5/1	A128 Left Ahead	O	-		-	-	-	592	1800:1800	388+645	58.5 : 56.6%	1184	0	0	0.7	4.1	0.7
5/3	A128 Ahead	O	-		-	-	-	183	1800	388	47.2%	183	0	0	0.4	8.7	0.4
7/1	Ahead Left	U	E		1	23	-	868	1900	633	117.1%	-	-	-	65.3	317.0	75.1
7/2	Ahead	U	E		1	23	-	916	1900	633	122.3%	-	-	-	82.4	383.0	92.8
7/3	Ahead	U	E		1	23	-	923	1900	633	121.8%	-	-	-	80.4	375.2	90.8
8/1	A13 (east) Left U-Turn	U	D		1	37	-	581	1900	1003	57.9%	-	-	-	2.6	15.8	8.4
8/2	A13 (east) Left	U	D		1	37	-	281	1900	1003	28.0%	-	-	-	0.9	11.9	3.2
11/1	A1013 Stanford Road (East) Left Left2	O	-		-	-	-	781	Inf	1167	66.9%	781	0	0	3.0	13.9	12.3
14/1	Brentwood Road (South) Ahead	O	-		-	-	-	750	Inf	604	124.1%	604	0	0	82.6	396.3	109.5
18/1	A1013 Stanford Road (West) Left Left2	O	-		-	-	-	708	Inf	562	126.0%	562	0	0	82.7	420.4	117.8

Basic Results Summary

C1	Stream: 1 PRC for Signalled Lanes (%):	-39.7	Total Delay for Signalled Lanes (pcuHr):	381.00	Cycle Time (s):	72
C1	Stream: 2 PRC for Signalled Lanes (%):	-35.9	Total Delay for Signalled Lanes (pcuHr):	231.64	Cycle Time (s):	72
	PRC Over All Lanes (%):	-40.0	Total Delay Over All Lanes(pcuHr):	782.01		

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E	F
A	0.0	9.1	338.6	343.6	417.1	419.2
B	126.9	131.3	20.8	25.8	33.8	33.9
C	118.7	122.8	0.0	18.9	26.9	30.9
D	493.8	498.0	824.4	0.0	405.3	409.3
E	512.6	517.3	842.2	850.9	918.9	425.4
F	416.7	0.0	756.0	761.3	835.2	833.3

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E	F
A	0.0	4.1	320.6	320.6	386.1	384.2
B	86.9	85.7	15.8	15.8	15.8	11.9
C	83.7	81.8	0.0	13.9	13.9	13.9
D	462.8	461.2	774.6	0.0	396.3	396.3
E	489.6	488.5	800.3	804.1	864.2	420.4
F	407.7	0.0	728.2	728.6	794.4	789.1

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 9: 2030 DS pAM DCC
1	B	8/1	C	10/1	20.82
2	C	11/1	D	13/1	18.86
3	B	8/1	D	13/1	25.82
4	A	5/3	F	17/1	417.78
5	B	8/2	B	6/2	131.42
6	B	8/2	F	17/1	33.92
7	C	11/1	F	17/1	30.86
8	B	8/2	A	4/2	126.42
9	C	11/1	B	6/2	-
10	D	14/1	F	17/1	409.34
11	C	11/1	A	4/2	118.22
12	D	14/1	F	17/1	409.34
13	C	11/1	E	16/1	26.86
14	C	11/1	C	10/1	-
15	D	14/1	E	16/1	405.34
16	D	14/1	B	6/2	498.36
18	D	14/1	A	4/2	493.36
19	E	18/1	A	4/1	513.98
20	A	5/3	A	4/2	-
21	C	11/1	B	6/1	-
23	E	18/1	A	4/2	510.42
24	E	18/1	F	17/1	425.39
25	F	1/2	A	4/2	416.92
26	D	14/1	B	6/1	498.36
27	E	18/1	B	6/1	515.42
28	F	1/2	B	6/1	-
29	A	5/2	E	16/1	417.09
30	A	5/2	D	13/1	-
31	C	11/1	F	17/1	30.86
32	B	8/2	B	6/1	131.42
33	B	8/1	E	16/1	33.82
34	A	5/2	F	17/1	421.09
35	D	14/1	D	13/1	-
36	D	14/1	C	10/1	824.02
37	F	1/3	F	17/1	830.40
38	E	18/1	B	6/2	515.42
39	F	1/2	A	4/1	416.47
40	E	18/1	D	13/1	846.47
41	E	18/1	C	10/1	841.47
42	F	1/2	B	6/2	-
43	F	1/2	D	13/1	756.04

Basic Results Summary

44	A	5/2	D	13/1	343.62
45	A	5/2	C	10/1	338.62
46	F	1/2	C	10/1	751.04
47	B	8/2	B	6/2	131.16
48	A	5/2	B	6/1	9.07
49	C	11/1	B	6/2	122.75
50	C	11/1	C	10/1	-
51	D	14/1	B	6/2	497.87
52	D	14/1	D	13/1	-
53	D	14/1	C	10/1	824.46
54	E	18/1	B	6/2	517.81
55	E	18/1	D	13/1	847.32
56	E	18/1	C	10/1	842.32
57	F	1/3	B	6/2	-
58	F	1/3	D	13/1	762.46
59	F	1/3	C	10/1	757.46
60	B	8/1	F	17/1	-
63	F	1/3	F	17/1	840.84
64	D	14/1	D	13/1	-
65	D	14/1	D	13/1	-
66	E	18/1	E	16/1	918.42
67	E	18/1	D	13/1	910.42
68	E	18/1	E	16/1	919.08
69	E	18/1	D	13/1	-
70	F	1/3	E	16/1	836.84
71	F	1/3	D	13/1	-
72	F	1/2	E	16/1	830.17
73	F	1/2	D	13/1	822.17
74	F	1/2	F	17/1	834.17
75	A	5/3	A	4/1	-
76	B	8/2	A	4/1	127.30
77	C	11/1	A	4/1	119.04
78	D	14/1	A	4/1	494.09

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 9: 2030 DS pAM DCC
1	B	8/1	C	10/1	15.82
2	C	11/1	D	13/1	13.86
3	B	8/1	D	13/1	15.82
4	A	5/3	F	17/1	382.78
5	B	8/2	B	6/2	86.42
6	B	8/2	F	17/1	11.92
7	C	11/1	F	17/1	13.86
8	B	8/2	A	4/2	86.42
9	C	11/1	B	6/2	-
10	D	14/1	F	17/1	396.34
11	C	11/1	A	4/2	83.22
12	D	14/1	F	17/1	396.34
13	C	11/1	E	16/1	13.86
14	C	11/1	C	10/1	-
15	D	14/1	E	16/1	396.34
16	D	14/1	B	6/2	462.36
18	D	14/1	A	4/2	462.36
19	E	18/1	A	4/1	490.98
20	A	5/3	A	4/2	-
21	C	11/1	B	6/1	-
23	E	18/1	A	4/2	487.42
24	E	18/1	F	17/1	420.39
25	F	1/2	A	4/2	407.92
26	D	14/1	B	6/1	462.36
27	E	18/1	B	6/1	487.42
28	F	1/2	B	6/1	-
29	A	5/2	E	16/1	386.09
30	A	5/2	D	13/1	-
31	C	11/1	F	17/1	13.86
32	B	8/2	B	6/1	86.42
33	B	8/1	E	16/1	15.82
34	A	5/2	F	17/1	386.09
35	D	14/1	D	13/1	-
36	D	14/1	C	10/1	775.02
37	F	1/3	F	17/1	786.40
38	E	18/1	B	6/2	487.42
39	F	1/2	A	4/1	407.47
40	E	18/1	D	13/1	800.47
41	E	18/1	C	10/1	800.47
42	F	1/2	B	6/2	-
43	F	1/2	D	13/1	724.04

Basic Results Summary

44	A	5/2	D	13/1	320.62
45	A	5/2	C	10/1	320.62
46	F	1/2	C	10/1	724.04
47	B	8/2	B	6/2	85.16
48	A	5/2	B	6/1	4.07
49	C	11/1	B	6/2	81.75
50	C	11/1	C	10/1	-
51	D	14/1	B	6/2	460.87
52	D	14/1	D	13/1	-
53	D	14/1	C	10/1	774.46
54	E	18/1	B	6/2	488.81
55	E	18/1	D	13/1	800.32
56	E	18/1	C	10/1	800.32
57	F	1/3	B	6/2	-
58	F	1/3	D	13/1	729.46
59	F	1/3	C	10/1	729.46
60	B	8/1	F	17/1	-
63	F	1/3	F	17/1	795.84
64	D	14/1	D	13/1	-
65	D	14/1	D	13/1	-
66	E	18/1	E	16/1	864.42
67	E	18/1	D	13/1	864.42
68	E	18/1	E	16/1	864.08
69	E	18/1	D	13/1	-
70	F	1/3	E	16/1	795.84
71	F	1/3	D	13/1	-
72	F	1/2	E	16/1	790.17
73	F	1/2	D	13/1	790.17
74	F	1/2	F	17/1	790.17
75	A	5/3	A	4/1	-
76	B	8/2	A	4/1	87.30
77	C	11/1	A	4/1	84.04
78	D	14/1	A	4/1	463.09

Basic Results Summary

Traffic Flows, Actual

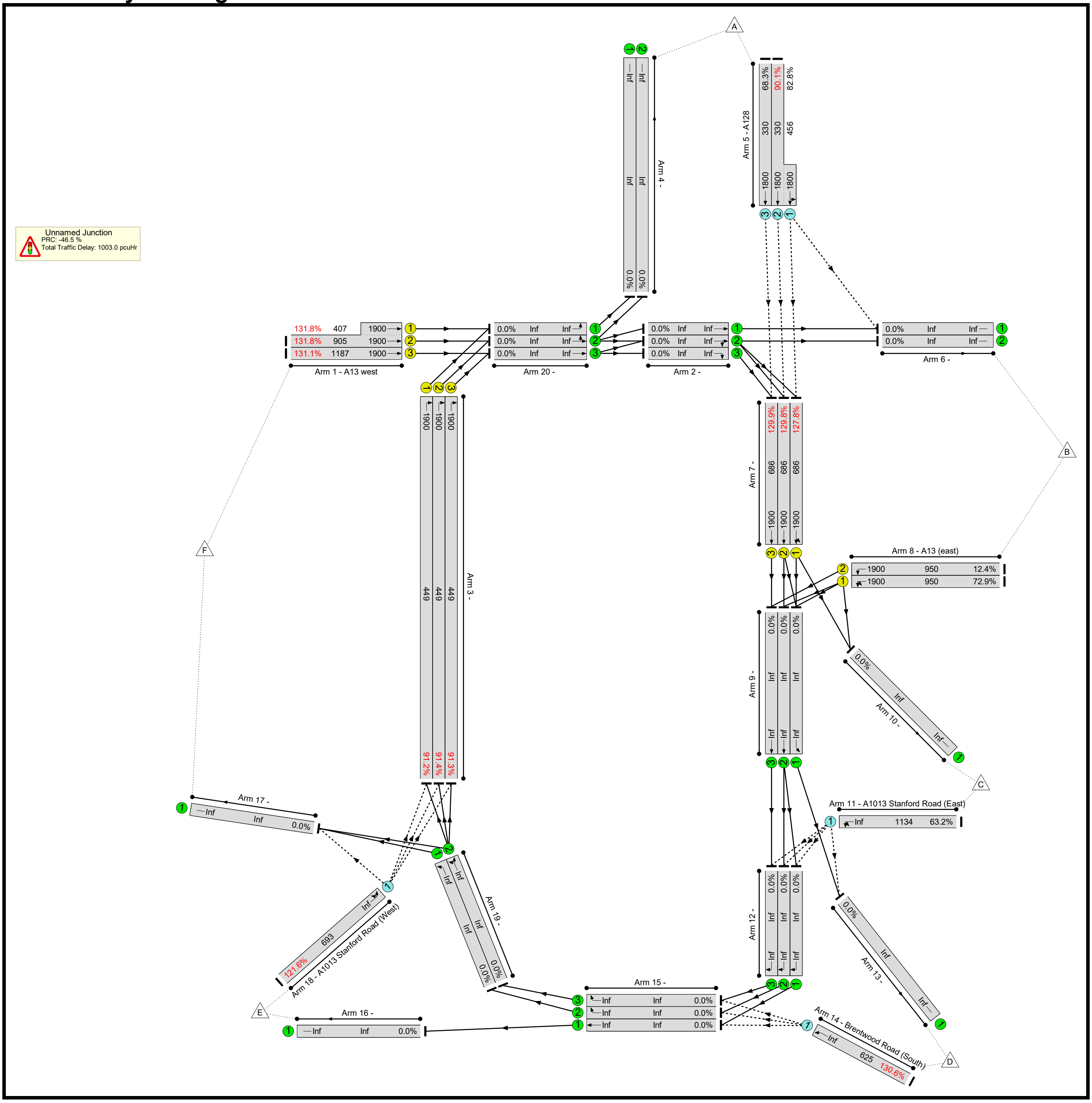
Actual Flow :

		Destination						
		A	B	C	D	E	F	Tot.
Origin	A	0	135	162	68	89	321	775
	B	272	5	10	165	406	4	862
	C	102	3	0	47	210	419	781
	D	257	245	39	0	74	135	750
	E	235	368	37	17	7	44	708
	F	1158	0	328	220	77	1342	3125
	Tot.	2024	756	576	517	863	2265	7001

Basic Results Summary

Scenario 10: '2030 DS AM DCC' (FG10: 'Dartford Closure 2030 LDO AM DS', 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: LTC Review	-	-	-		-	-	-	-	-	-	**131.8%**	**3608**	**0**	**0**	**1003.0**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**131.8%**	**3608**	**0**	**0**	**1003.0**	-	-
1/2+1/1	A13 west Ahead	U	A		1	44	-	1730	1900:1900	905+407	131.8 : 131.8%	-	-	-	229.2	477.0	253.4
1/3	A13 west Ahead	U	A		1	44	-	1557	1900	1187	131.1%	-	-	-	205.2	474.4	226.7
3/1	Right	U	B		1	16	-	483	1900	449	91.2%	-	-	-	6.7	59.1	12.4
3/2	Right	U	B		1	16	-	521	1900	449	91.4%	-	-	-	6.5	56.8	12.5
3/3	Right	U	B		1	16	-	509	1900	449	91.3%	-	-	-	6.6	58.2	12.4
5/2+5/1	A128 Left Ahead	O	-		-	-	-	674	1800:1800	330+456	90.1 : 82.8%	1348	0	0	3.0	15.9	6.3
5/3	A128 Ahead	O	-		-	-	-	225	1800	330	68.3%	225	0	0	1.1	17.1	1.8
7/1	Ahead Left	U	E		1	25	-	1071	1900	686	127.8%	-	-	-	110.4	453.3	121.8
7/2	Ahead	U	E		1	25	-	1078	1900	686	129.8%	-	-	-	117.2	473.9	129.4
7/3	Ahead	U	E		1	25	-	1099	1900	686	129.9%	-	-	-	117.5	474.6	129.8
8/1	A13 (east) Left U-Turn	U	D		1	35	-	693	1900	950	72.9%	-	-	-	4.1	21.1	12.1
8/2	A13 (east) Left	U	D		1	35	-	118	1900	950	12.4%	-	-	-	0.4	11.8	1.3
11/1	A1013 Stanford Road (East) Left Left2	O	-		-	-	-	717	Inf	1134	63.2%	717	0	0	2.5	12.5	11.0
14/1	Brentwood Road (South) Ahead	O	-		-	-	-	816	Inf	625	130.6%	625	0	0	107.3	473.4	146.7
18/1	A1013 Stanford Road (West) Left Left2	O	-		-	-	-	843	Inf	693	121.6%	693	0	0	85.4	364.5	128.2

Basic Results Summary

C1	Stream: 1	PRC for Signalled Lanes (%):	-46.5	Total Delay for Signalled Lanes (pcuHr):	454.23	Cycle Time (s):	72
C1	Stream: 2	PRC for Signalled Lanes (%):	-44.4	Total Delay for Signalled Lanes (pcuHr):	349.60	Cycle Time (s):	72
		PRC Over All Lanes (%):	-46.5	Total Delay Over All Lanes(pcuHr):	1003.03		

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E	F
A	0.0	20.5	486.1	491.8	519.5	524.4
B	115.9	121.8	26.1	31.1	39.1	33.8
C	106.9	112.7	0.0	17.5	25.5	29.5
D	560.1	565.5	1023.3	0.0	482.4	486.4
E	446.8	451.1	908.7	916.3	0.0	369.5
F	485.9	0.0	959.8	968.0	991.7	994.4

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E	F
A	0.0	15.5	468.1	468.8	488.5	489.4
B	75.9	75.8	21.1	21.1	21.1	11.8
C	71.9	71.7	0.0	12.5	12.5	12.5
D	529.1	529.0	973.7	0.0	473.4	473.4
E	423.8	422.6	867.1	869.8	0.0	364.5
F	476.9	0.0	932.1	935.4	951.0	950.3

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 10: 2030 DS AM DCC
1	B	8/1	C	10/1	26.10
2	C	11/1	D	13/1	17.53
3	B	8/1	D	13/1	31.10
4	A	5/3	F	17/1	524.72
5	B	8/2	B	6/2	-
6	B	8/2	F	17/1	33.78
7	C	11/1	F	17/1	29.53
8	B	8/2	A	4/2	115.60
9	C	11/1	B	6/2	-
10	D	14/1	F	17/1	486.37
11	C	11/1	A	4/2	106.70
12	D	14/1	F	17/1	486.37
13	C	11/1	E	16/1	25.53
14	C	11/1	C	10/1	-
15	D	14/1	E	16/1	482.37
16	D	14/1	B	6/2	565.02
18	D	14/1	A	4/2	560.02
19	E	18/1	A	4/1	447.12
20	A	5/3	A	4/2	-
21	C	11/1	B	6/1	-
23	E	18/1	A	4/2	444.19
24	E	18/1	F	17/1	369.54
25	F	1/2	A	4/2	486.19
26	D	14/1	B	6/1	565.02
27	E	18/1	B	6/1	449.19
28	F	1/2	B	6/1	-
29	A	5/2	E	16/1	519.55
30	A	5/2	D	13/1	511.55
31	C	11/1	F	17/1	29.53
32	B	8/2	B	6/1	-
33	B	8/1	E	16/1	39.10
34	A	5/2	F	17/1	523.55
35	D	14/1	D	13/1	-
36	D	14/1	C	10/1	1022.69
37	F	1/3	F	17/1	993.63
38	E	18/1	B	6/2	449.19
39	F	1/2	A	4/1	485.64
40	E	18/1	D	13/1	912.13
41	E	18/1	C	10/1	907.13
42	F	1/2	B	6/2	-

Basic Results Summary

43	F	1/2	D	13/1	964.90
44	A	5/2	D	13/1	491.10
45	A	5/2	C	10/1	486.10
46	F	1/2	C	10/1	959.90
47	B	8/2	B	6/2	121.82
48	A	5/2	B	6/1	20.49
49	C	11/1	B	6/2	112.74
50	C	11/1	C	10/1	-
51	D	14/1	B	6/2	565.93
52	D	14/1	D	13/1	-
53	D	14/1	C	10/1	1023.70
54	E	18/1	B	6/2	452.94
55	E	18/1	D	13/1	914.81
56	E	18/1	C	10/1	909.81
57	F	1/3	B	6/2	-
58	F	1/3	D	13/1	964.78
59	F	1/3	C	10/1	959.78
60	B	8/1	F	17/1	-
63	F	1/3	F	17/1	995.79
64	D	14/1	D	13/1	-
65	D	14/1	D	13/1	-
66	E	18/1	E	16/1	-
67	E	18/1	D	13/1	933.09
68	E	18/1	E	16/1	-
69	E	18/1	D	13/1	934.92
70	F	1/3	E	16/1	991.79
71	F	1/3	D	13/1	-
72	F	1/2	E	16/1	991.39
73	F	1/2	D	13/1	983.39
74	F	1/2	F	17/1	995.39
75	A	5/3	A	4/1	-
76	B	8/2	A	4/1	115.96
77	C	11/1	A	4/1	107.00
78	D	14/1	A	4/1	560.12

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 10: 2030 DS AM DCC
1	B	8/1	C	10/1	21.10
2	C	11/1	D	13/1	12.53
3	B	8/1	D	13/1	21.10
4	A	5/3	F	17/1	489.72
5	B	8/2	B	6/2	-
6	B	8/2	F	17/1	11.78
7	C	11/1	F	17/1	12.53
8	B	8/2	A	4/2	75.60
9	C	11/1	B	6/2	-
10	D	14/1	F	17/1	473.37
11	C	11/1	A	4/2	71.70
12	D	14/1	F	17/1	473.37
13	C	11/1	E	16/1	12.53
14	C	11/1	C	10/1	-
15	D	14/1	E	16/1	473.37
16	D	14/1	B	6/2	529.02
18	D	14/1	A	4/2	529.02
19	E	18/1	A	4/1	424.12
20	A	5/3	A	4/2	-
21	C	11/1	B	6/1	-
23	E	18/1	A	4/2	421.19
24	E	18/1	F	17/1	364.54
25	F	1/2	A	4/2	477.19
26	D	14/1	B	6/1	529.02
27	E	18/1	B	6/1	421.19
28	F	1/2	B	6/1	-
29	A	5/2	E	16/1	488.55
30	A	5/2	D	13/1	488.55
31	C	11/1	F	17/1	12.53
32	B	8/2	B	6/1	-
33	B	8/1	E	16/1	21.10
34	A	5/2	F	17/1	488.55
35	D	14/1	D	13/1	-
36	D	14/1	C	10/1	973.69
37	F	1/3	F	17/1	949.63
38	E	18/1	B	6/2	421.19
39	F	1/2	A	4/1	476.64
40	E	18/1	D	13/1	866.13
41	E	18/1	C	10/1	866.13
42	F	1/2	B	6/2	-

Basic Results Summary

43	F	1/2	D	13/1	932.90
44	A	5/2	D	13/1	468.10
45	A	5/2	C	10/1	468.10
46	F	1/2	C	10/1	932.90
47	B	8/2	B	6/2	75.82
48	A	5/2	B	6/1	15.49
49	C	11/1	B	6/2	71.74
50	C	11/1	C	10/1	-
51	D	14/1	B	6/2	528.93
52	D	14/1	D	13/1	-
53	D	14/1	C	10/1	973.70
54	E	18/1	B	6/2	423.94
55	E	18/1	D	13/1	867.81
56	E	18/1	C	10/1	867.81
57	F	1/3	B	6/2	-
58	F	1/3	D	13/1	931.78
59	F	1/3	C	10/1	931.78
60	B	8/1	F	17/1	-
63	F	1/3	F	17/1	950.79
64	D	14/1	D	13/1	-
65	D	14/1	D	13/1	-
66	E	18/1	E	16/1	-
67	E	18/1	D	13/1	887.09
68	E	18/1	E	16/1	-
69	E	18/1	D	13/1	887.92
70	F	1/3	E	16/1	950.79
71	F	1/3	D	13/1	-
72	F	1/2	E	16/1	951.39
73	F	1/2	D	13/1	951.39
74	F	1/2	F	17/1	951.39
75	A	5/3	A	4/1	-
76	B	8/2	A	4/1	75.96
77	C	11/1	A	4/1	72.00
78	D	14/1	A	4/1	529.12

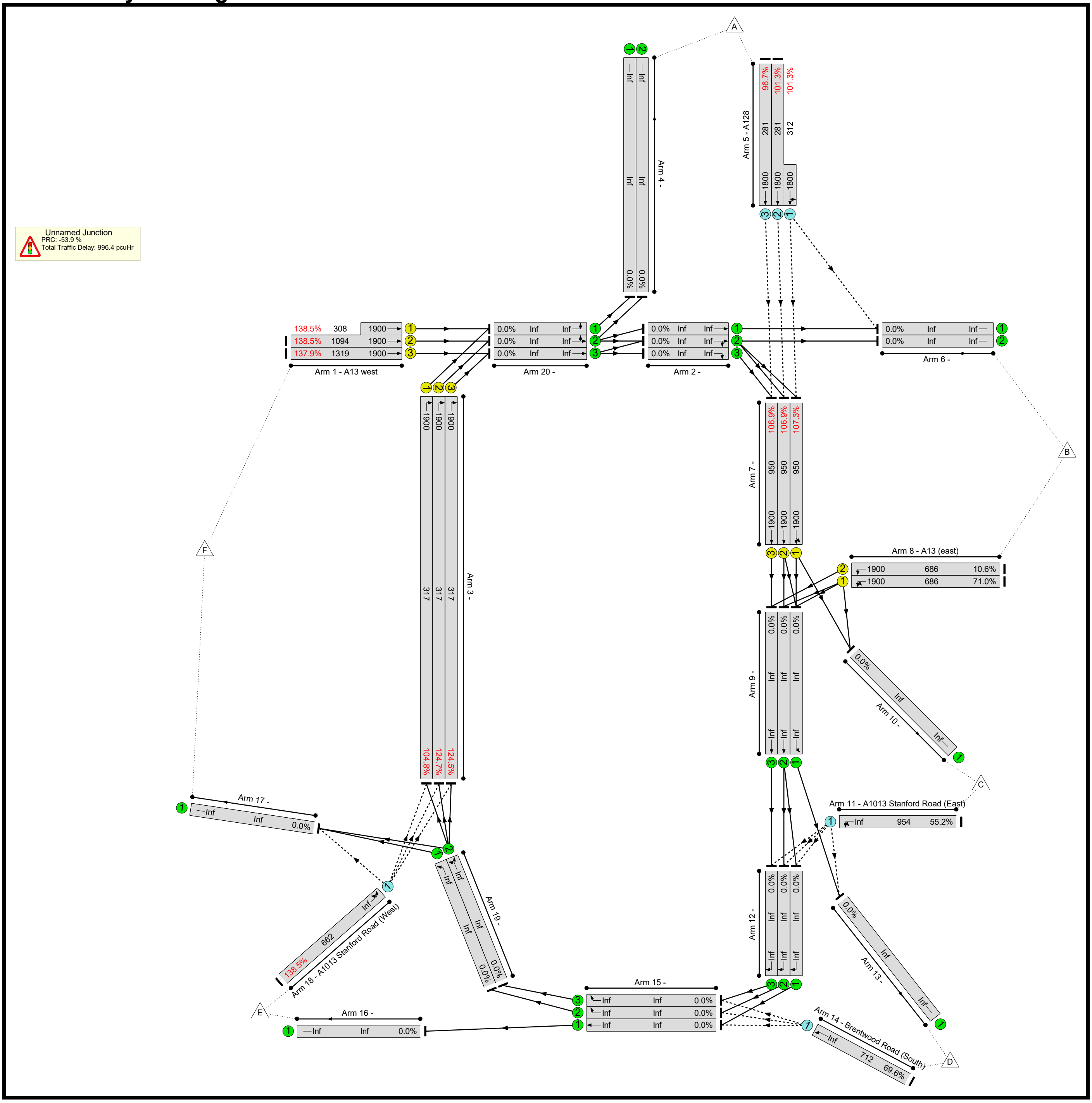
Traffic Flows, Actual

Actual Flow :

		Destination						
Origin		A	B	C	D	E	F	Tot.
	A	0	156	141	83	212	307	899
	B	116	1	13	142	538	1	811
	C	55	1	0	78	229	354	717
	D	242	268	39	0	140	127	816
	E	147	459	120	65	0	52	843
	F	1006	0	465	205	80	1531	3287
	Tot.	1566	885	778	573	1199	2372	7373

Scenario 11: '2030 DS PM DCC' (FG11: 'Dartford Closure 2030 LDO PM DS', 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: LTC Review	-	-	-		-	-	-	-	-	-	**138.5%**	**3152**	**0**	**0**	**996.4**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**138.5%**	**3152**	**0**	**0**	**996.4**	-	-
1/2+1/1	A13 west Ahead	U	A		1	49	-	1942	1900:1900	1094+308	138.5 : 138.5%	-	-	-	296.7	550.1	325.7
1/3	A13 west Ahead	U	A		1	49	-	1819	1900	1319	137.9%	-	-	-	277.4	548.9	303.4
3/1	Right	U	B		1	11	-	404	1900	317	104.8%	-	-	-	16.4	177.5	20.6
3/2	Right	U	B		1	11	-	481	1900	317	124.7%	-	-	-	47.1	429.3	51.3
3/3	Right	U	B		1	11	-	481	1900	317	124.5%	-	-	-	46.8	427.7	50.9
5/2+5/1	A128 Left Ahead	O	-		-	-	-	601	1800:1800	281+312	101.3 : 101.3%	1195	0	0	14.8	88.6	30.6
5/3	A128 Ahead	O	-		-	-	-	272	1800	281	96.7%	272	0	0	6.5	85.5	10.2
7/1	Ahead Left	U	E		1	35	-	1381	1900	950	107.3%	-	-	-	47.6	168.3	62.5
7/2	Ahead	U	E		1	35	-	1318	1900	950	106.9%	-	-	-	46.0	163.0	60.8
7/3	Ahead	U	E		1	35	-	1297	1900	950	106.9%	-	-	-	45.7	162.1	60.8
8/1	A13 (east) Left U-Turn	U	D		1	25	-	487	1900	686	71.0%	-	-	-	3.9	28.7	9.5
8/2	A13 (east) Left	U	D		1	25	-	73	1900	686	10.6%	-	-	-	0.4	18.2	1.0
11/1	A1013 Stanford Road (East) Left Left2	O	-		-	-	-	527	Inf	954	55.2%	527	0	0	2.3	15.6	8.4
14/1	Brentwood Road (South) Ahead	O	-		-	-	-	496	Inf	712	69.6%	496	0	0	1.4	10.5	8.0
18/1	A1013 Stanford Road (West) Left Left2	O	-		-	-	-	917	Inf	662	138.5%	662	0	0	143.4	562.9	184.2

Basic Results Summary

C1	Stream: 1 PRC for Signalled Lanes (%):	-53.9	Total Delay for Signalled Lanes (pcuHr):	684.42	Cycle Time (s):	72
C1	Stream: 2 PRC for Signalled Lanes (%):	-19.2	Total Delay for Signalled Lanes (pcuHr):	143.60	Cycle Time (s):	72
	PRC Over All Lanes (%):	-53.9	Total Delay Over All Lanes(pcuHr):	996.40		

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E	F
A	502.7	90.8	273.5	279.9	288.5	286.9
B	230.6	479.0	33.7	38.7	46.7	0.0
C	224.6	477.5	0.0	20.6	28.6	32.6
D	221.9	472.3	660.6	0.0	19.5	23.5
E	764.8	1022.4	1210.8	1211.8	0.0	567.9
F	558.9	0.0	744.0	745.2	751.6	754.4

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E	F
A	449.7	85.8	255.5	256.9	257.5	251.9
B	190.6	434.0	28.7	28.7	28.7	0.0
C	189.6	436.5	0.0	15.6	15.6	15.6
D	190.9	435.8	611.1	0.0	10.5	10.5
E	741.8	993.9	1169.3	1165.3	0.0	562.9
F	549.9	0.0	716.4	712.8	711.1	710.3

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 11: 2030 DS PM DCC
1	B	8/1	C	10/1	33.69
2	C	11/1	D	13/1	20.61
3	B	8/1	D	13/1	38.69
4	A	5/3	F	17/1	286.72
5	B	8/2	B	6/2	479.05
6	B	8/2	F	17/1	-
7	C	11/1	F	17/1	32.61
8	B	8/2	A	4/2	-
9	C	11/1	B	6/2	-
10	D	14/1	F	17/1	23.49
11	C	11/1	A	4/2	-
12	D	14/1	F	17/1	23.49
13	C	11/1	E	16/1	28.61
14	C	11/1	C	10/1	-
15	D	14/1	E	16/1	19.49
16	D	14/1	B	6/2	472.75
18	D	14/1	A	4/2	-
19	E	18/1	A	4/1	764.81
20	A	5/3	A	4/2	-
21	C	11/1	B	6/1	-
23	E	18/1	A	4/2	-
24	E	18/1	F	17/1	567.94
25	F	1/2	A	4/2	559.22
26	D	14/1	B	6/1	472.75
27	E	18/1	B	6/1	1022.53
28	F	1/2	B	6/1	-
29	A	5/2	E	16/1	288.52
30	A	5/2	D	13/1	280.52
31	C	11/1	F	17/1	32.61
32	B	8/2	B	6/1	479.05
33	B	8/1	E	16/1	46.69
34	A	5/2	F	17/1	292.52
35	D	14/1	D	13/1	-
36	D	14/1	C	10/1	661.43
37	F	1/3	F	17/1	753.52
38	E	18/1	B	6/2	1022.53
39	F	1/2	A	4/1	558.66
40	E	18/1	D	13/1	1216.45
41	E	18/1	C	10/1	1211.45
42	F	1/2	B	6/2	-

Basic Results Summary

43	F	1/2	D	13/1	748.95
44	A	5/2	D	13/1	278.46
45	A	5/2	C	10/1	273.46
46	F	1/2	C	10/1	743.95
47	B	8/2	B	6/2	-
48	A	5/2	B	6/1	90.80
49	C	11/1	B	6/2	477.47
50	C	11/1	C	10/1	-
51	D	14/1	B	6/2	471.78
52	D	14/1	D	13/1	-
53	D	14/1	C	10/1	659.73
54	E	18/1	B	6/2	1022.18
55	E	18/1	D	13/1	1215.18
56	E	18/1	C	10/1	1210.18
57	F	1/3	B	6/2	-
58	F	1/3	D	13/1	749.00
59	F	1/3	C	10/1	744.00
60	B	8/1	F	17/1	-
63	F	1/3	F	17/1	755.61
64	D	14/1	D	13/1	-
65	D	14/1	D	13/1	-
66	E	18/1	E	16/1	-
67	E	18/1	D	13/1	1211.41
68	E	18/1	E	16/1	-
69	E	18/1	D	13/1	1210.05
70	F	1/3	E	16/1	751.61
71	F	1/3	D	13/1	743.61
72	F	1/2	E	16/1	751.56
73	F	1/2	D	13/1	743.56
74	F	1/2	F	17/1	755.56
75	A	5/3	A	4/1	502.70
76	B	8/2	A	4/1	230.58
77	C	11/1	A	4/1	224.60
78	D	14/1	A	4/1	221.87

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 11: 2030 DS PM DCC
1	B	8/1	C	10/1	28.69
2	C	11/1	D	13/1	15.61
3	B	8/1	D	13/1	28.69
4	A	5/3	F	17/1	251.72
5	B	8/2	B	6/2	434.05
6	B	8/2	F	17/1	-
7	C	11/1	F	17/1	15.61
8	B	8/2	A	4/2	-
9	C	11/1	B	6/2	-
10	D	14/1	F	17/1	10.49
11	C	11/1	A	4/2	-
12	D	14/1	F	17/1	10.49
13	C	11/1	E	16/1	15.61
14	C	11/1	C	10/1	-
15	D	14/1	E	16/1	10.49
16	D	14/1	B	6/2	436.75
18	D	14/1	A	4/2	-
19	E	18/1	A	4/1	741.81
20	A	5/3	A	4/2	-
21	C	11/1	B	6/1	-
23	E	18/1	A	4/2	-
24	E	18/1	F	17/1	562.94
25	F	1/2	A	4/2	550.22
26	D	14/1	B	6/1	436.75
27	E	18/1	B	6/1	994.53
28	F	1/2	B	6/1	-
29	A	5/2	E	16/1	257.52
30	A	5/2	D	13/1	257.52
31	C	11/1	F	17/1	15.61
32	B	8/2	B	6/1	434.05
33	B	8/1	E	16/1	28.69
34	A	5/2	F	17/1	257.52
35	D	14/1	D	13/1	-
36	D	14/1	C	10/1	612.43
37	F	1/3	F	17/1	709.52
38	E	18/1	B	6/2	994.53
39	F	1/2	A	4/1	549.66
40	E	18/1	D	13/1	1170.45
41	E	18/1	C	10/1	1170.45
42	F	1/2	B	6/2	-

Basic Results Summary

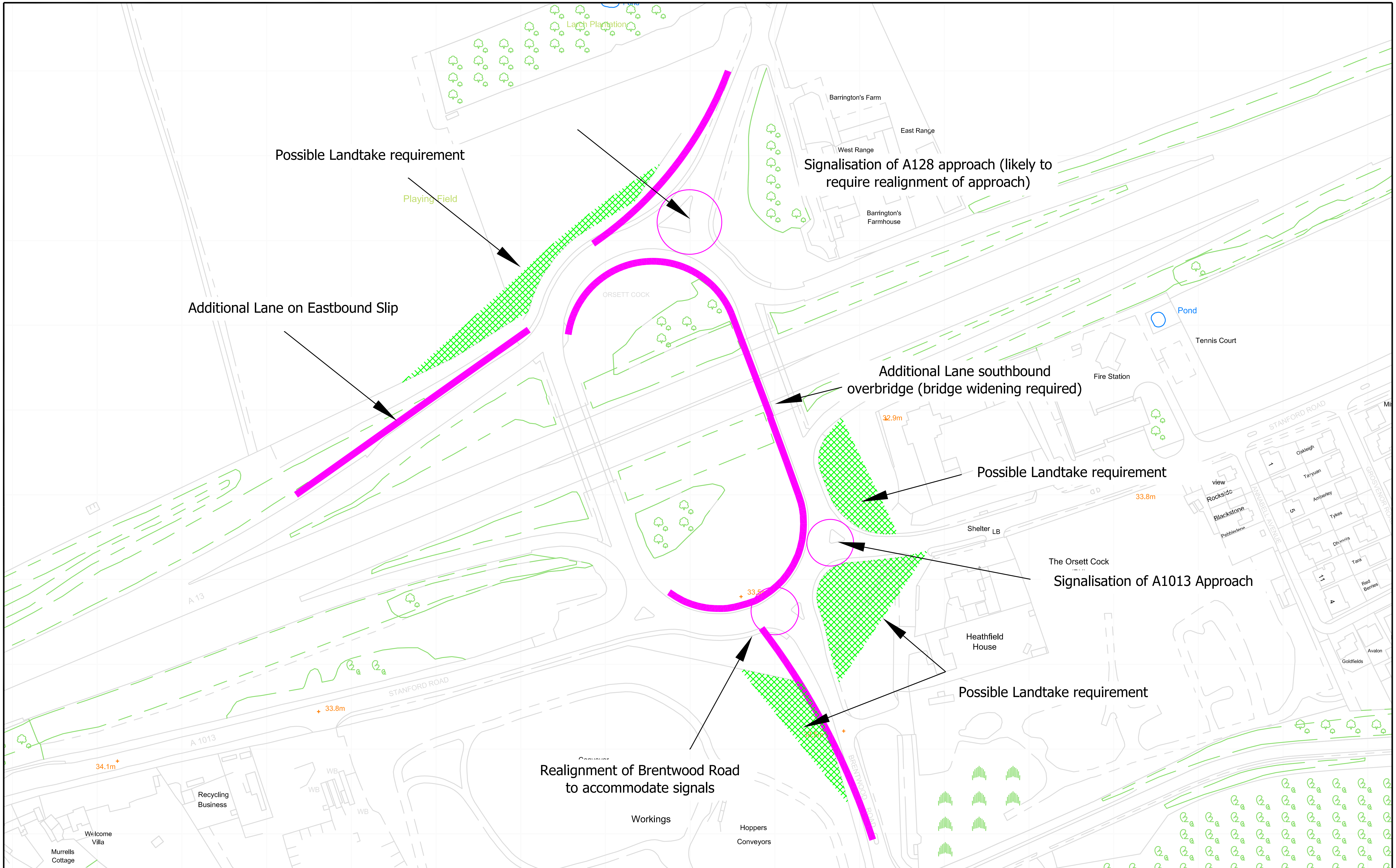
43	F	1/2	D	13/1	716.95
44	A	5/2	D	13/1	255.46
45	A	5/2	C	10/1	255.46
46	F	1/2	C	10/1	716.95
47	B	8/2	B	6/2	-
48	A	5/2	B	6/1	85.80
49	C	11/1	B	6/2	436.47
50	C	11/1	C	10/1	-
51	D	14/1	B	6/2	434.78
52	D	14/1	D	13/1	-
53	D	14/1	C	10/1	609.73
54	E	18/1	B	6/2	993.18
55	E	18/1	D	13/1	1168.18
56	E	18/1	C	10/1	1168.18
57	F	1/3	B	6/2	-
58	F	1/3	D	13/1	716.00
59	F	1/3	C	10/1	716.00
60	B	8/1	F	17/1	-
63	F	1/3	F	17/1	710.61
64	D	14/1	D	13/1	-
65	D	14/1	D	13/1	-
66	E	18/1	E	16/1	-
67	E	18/1	D	13/1	1165.41
68	E	18/1	E	16/1	-
69	E	18/1	D	13/1	1163.05
70	F	1/3	E	16/1	710.61
71	F	1/3	D	13/1	710.61
72	F	1/2	E	16/1	711.56
73	F	1/2	D	13/1	711.56
74	F	1/2	F	17/1	711.56
75	A	5/3	A	4/1	449.70
76	B	8/2	A	4/1	190.58
77	C	11/1	A	4/1	189.60
78	D	14/1	A	4/1	190.87

Traffic Flows, Actual

Actual Flow :

		Destination						
		A	B	C	D	E	F	Tot.
Origin	A	3	144	123	165	162	276	873
	B	71	2	19	166	302	0	560
	C	25	1	0	70	158	273	527
	D	46	317	18	0	43	72	496
	E	259	370	159	95	0	34	917
	F	766	0	921	302	50	1722	3761
	Tot.	1170	834	1240	798	715	2377	7134

Appendix E



Based upon the ORDNANCE SURVEY MAPS with the permission of THE CONTROLLER OF HER MAJESTY'S STATIONERY OFFICE

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DRAWING TITLE
Concept Highway Capacity Improvements

SCALE	DRAWN BY	DATE	DRAWING No	REVISION
1/2000	RM/ST	July 23	20491-04 App 158	

Appendix F

Lower Thames Crossing

Manorway
2030 & 2045 Operational Appraisal
Design Release 4.3 Operational Modelling

DATE: September 2022

Planning Inspectorate Scheme Ref: TR010032
Document Ref: HE540039-LTC-TTM-GEN-REP-DCO-00002

VERSION: 1.0

App 160

Lower Thames Crossing

Manorway 2030 & 2045 Operational Appraisal

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1 Introduction

1.1 Purpose of document

1.1.1 The purpose of this document is to present the findings from the traffic operation appraisal undertaken for Design Release 4.3 (DR4.3) of Manorway roundabout on the A13, A1014 The Manorway/ The Sorrells junction and Sorrells roundabout on the A1014, near DP World Gateway Port.

1.2 Modelling Software

1.2.1 Road traffic micro-simulation models represent individual vehicles travelling within the road network, providing realistic driver behaviour such as lane changing and overtaking. The micro-simulation software selected for the Lower Thames Crossing is VISSIM. The model has been developed in VISSIM version 11 (SP14).

1.3 The Project

1.3.1 The A122 Lower Thames Crossing (the Project) would provide a connection between the A2 and M2 in Kent, east of Gravesend, crossing under the River Thames through a tunnel, before joining the M25 south of junction 29. The Project route is presented in Plate 1-1.

Plate 1-1 Lower Thame Crossing route

1.3.2 The A122 road would be approximately 23km long, 4.25km of which would be in tunnel. On the south side of the River Thames, the Project route would link the tunnel to the A2 and M2. On the north side, it would link to the A13 and junction 29 of the M25. The tunnel entrances would be located to the east of the village of Chalk on the south of the River Thames and to the west of East Tilbury on the north side.

1.3.3 Junctions are proposed at the following locations:

a) New junction with the A2 to the south-east of Gravesend

b) Modified junction with the A13/ A1089 in Thurrock

c) New junction with the M25 between junctions 29 and 30

1.3.4 To align with NPSNN policy and to help the Project meet the Scheme Objectives, it is proposed that road user charges would be levied. Vehicles would be charged for using the new tunnel.

1.3.5 The Project route would be three lanes in both directions, except for:

a) link roads

b) stretches of the carriageway through junctions

c) the southbound carriageway from the M25 to the junction with the A13/ A1089, which would be two lanes

1.3.6 In common with other A-roads, the A122 would operate with no hard shoulder but would feature a 1m hard strip on either side of the carriageway. It would also feature technology including stopped vehicle and incident detection, lane control, variable speed limits and electronic signage and signalling. Our A122 road design outside of the tunnel includes emergency areas spaced at intervals between 800 metres and 1.6km (less than one mile). The tunnel would include a range of enhanced systems and response measures instead of emergency areas.

1.3.7 The A122 would be classified as an 'all-purpose trunk road' with green signs. For the benefit of safety, walkers, cyclists, horse-riders and slow-moving vehicles would be prohibited from using it.

1.3.8 The Project would include adjustment to a number of side roads. There would also be changes to a number of public rights of way, used by walkers, cyclists, and horse riders. Construction of the Project would also require the installation and diversion of a number of utilities, including gas pipelines, overhead power lines and underground electricity cables, as well as water supplies and telecommunications assets and associated infrastructure.

1.3.9 The Project has been developed to avoid or minimise significant effects on the environment. Some of the measures adopted include landscaping, noise mitigation, green bridges, floodplain compensation, new areas of ecological habitat and two new parks.

1.4 Structure of this report

1.4.1 The report provides the methodology of the modelling process including:

a) Chapter 2: Modelling Scope;

b) Chapter 3: VISSIM Model Development;

c) Chapter 4: Modelling Results;

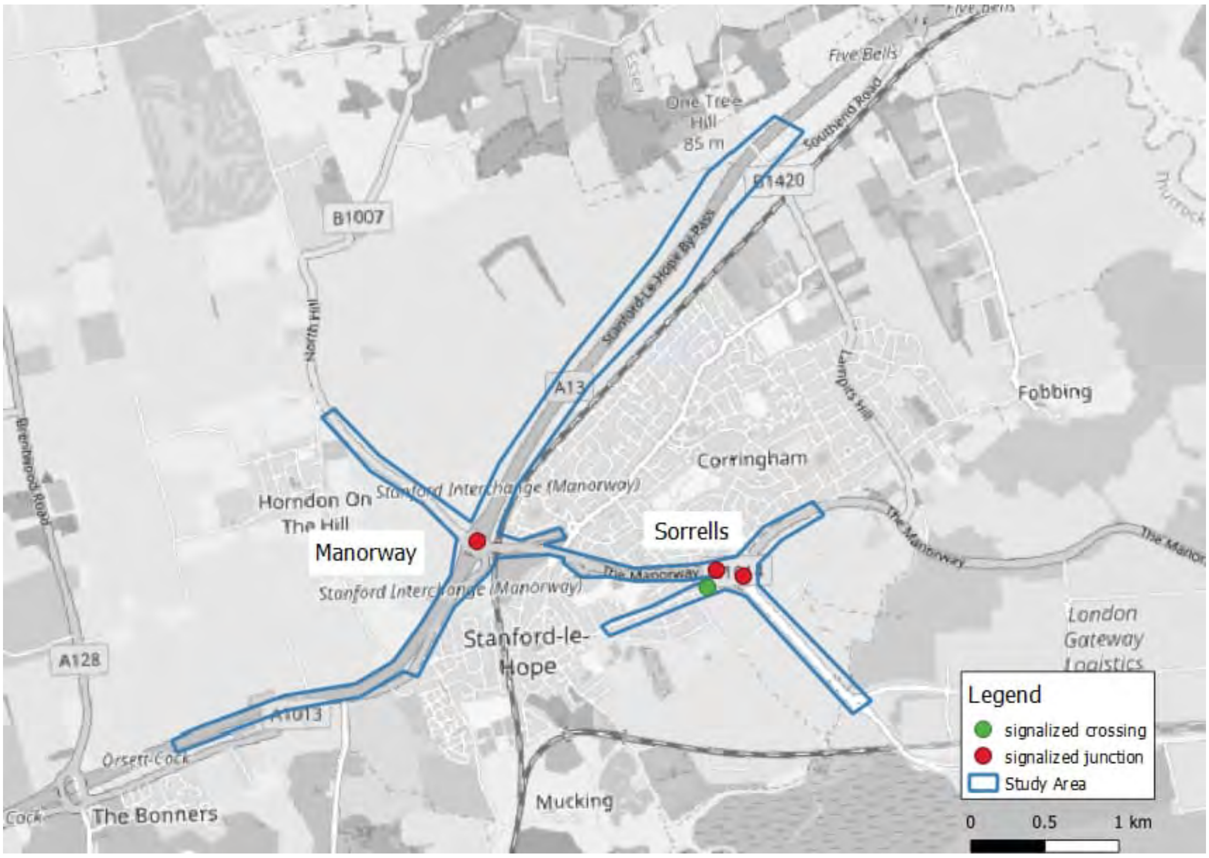
d) Chapter 5: Sensitivity Tests; and

e) Chapter 6: Conclusion.

2 Modelling Scope

2.1.1 The traffic operation study area is located north of Stanford-le-Hope and Plate 2-1 shows the extent of the study area covered by the VISSIM model. It includes three junctions and one signalised pedestrian crossing.

Plate 2-1 Traffic Operations Study Area



2.1.2 The list of junctions and the junction type included in the model is show in Table 2-1, and Table 2-2 lists the standalone signalised pedestrian crossing included the model.

Table 2-1 Modelled Junctions and Junction Type

Nr	Junction	Junction Type
1	Manorway roundabout	Signalised Roundabout
2	A1014 The Manorway/ The Sorrells	Signalised T-junction
3	Sorrells roundabout	Signalised Roundabout

Table 2-2 Modelled Signalised Pedestrian Crossings

A	Pedestrian Crossings on Corringham Rd (near Sorrells roundabout)

3 VISSIM Model Development

3.1 Technical Guidance

3.1.1 The Department for Transport's (DfT) Transport Analysis Guidance (TAG) has little guidance specific to micro-simulation models. Therefore, in accordance with industry best practice, this operational appraisal references the Transport for London (TfL) modelling guidelines which cover micro-simulation models in detail, in particular:

a) Traffic Modelling Guidelines, TfL, Version 4.0 (September 2021); and

b) Model Auditing Process (MAP) – Traffic Schemes in London Urban Network, TfL, Version 3.5.

3.2 Network Development

3.2.1 The Do Minimum (without LTC) and Do Something (with LTC) networks are the same, as there are no changes proposed to the network with LTC in operation.

3.2.2 The link structure for the network (Do Minimum and Do Something), including link lengths, connector turning movements, bus lanes and bus stop locations were coded using the latest available OS mapping, informed by Google Earth aerial photography.

3.2.3 Reduced speed areas were set up on all turning movements, with tighter turns having lower reduced speed values. Desired Speed decisions were used to set desired speeds on entry to the network and where there is a change in the posted speed limit. Vehicles attempt to travel in the model at this constant desired speed and will only adjust this speed if they approach a queue or are performing a lane change or enter a reduced speed area.

3.2.4 Priority rules have been used where one traffic movement has to give way to another traffic movement at priority junctions. The default values of a 5m headway and 3-second gap time were used.

3.2.5 Gap time and headway values were reviewed and updated as part of the model calibration process to replicate site conditions and these were then adjusted based upon considerations of geometry, position and the types of vehicles stopping. The gap times for heavy vehicles (buses and Heavy Goods Vehicles) are longer than for light vehicles (cars and Light Goods Vehicles). This reflects the fact that large vehicles have to wait for larger gaps in traffic than cars.

3.3 Signalised Junctions and Crossings

3.3.1 There are three signalised junctions in the study area and one signalised pedestrian crossing, as shown in Plate 2-1 above and listed in Table 2-1 and Table 2-2 respectively.

3.3.2 All signals within the VISSIM model were coded as fixed, apart from the one pedestrian crossing which was coded as demand dependant.

3.3.3 Intergreens were calculated and signal timings were optimised in relation to the traffic flows at the junctions.

3.3.4 All relevant PUA (interstage) files and VAP (controller logic) files accompany the VISSIM models.

3.4 Traffic Signals Optimisation

3.4.1 The operation of traffic signals in the Do Minimum and Do Something network were initially optimised using LinSIG models and then further fine-tuned in VISSIM to reflect the small changes in demand and arrival pattern of vehicles in the 15-minute intervals.

3.4.2 A cycle time of 60 seconds was used in the DM and DS models.

3.5 Traffic Demand Matrices

3.5.1 The model contains three vehicle classes:

- Cars;
- Light Goods Vehicles (LGVs); and
- Heavy Goods Vehicles (HGVs).

3.5.2 The hourly matrices for Cars, LGVs and HGVs were prepared using the actual flows directly from an LTAM cordon of the study area.

3.6 Public Transport

3.6.1 The following bus routes have been included in the model:

- 100
- 27
- Z4

3.6.2 Bus routes were coded separately from general traffic. They were coded using the VISSIM public transport lines feature, with a public transport line set up for each bus route. Bus route and frequency information was derived from bus timetable information that is publicly available on Thurrock Council website. For all bus routes and bus stops, a dwell time of 10 seconds with a 2 second standard deviation has been modelled.

3.6.3 A summary of the modelled bus routes and their frequency is presented in Table 3-1.

Table 3-1 Modelled Bus Routes and Frequency

Bus Route	AM (07:00 – 08:00)	PM (17:00 – 18:00)
100 (EB)	4 per hour	4 per hour
100 (WB)	4 per hour	4 per hour
27 (EB)	1 per hour	1 per hour
27 (WB)	1 per hour	1 per hour
Z4 (EB)	1 per hour	1 per hour
Z4 (WB)	1 per hour	1 per hour

3.7 Traffic Assignment

3.7.1 The traffic is assigned using 'dynamic assignment'. Origin-Destination (OD) matrices are used to connect all zones in the model area. As there is no route choice in the model, each OD pair has a unique route and converging the models was not required. Each model has 10x10 matrices for the warm-up period and the peak hour.

3.8 Number of Random Seed Records

3.8.1 Traffic conditions are variable and this affects:

a) **Overall traffic volumes,** accounted for in VISSIM by selecting a representative peak hour.

b) **Random Driver Behaviours,** with traffic conditions varying day-to-day as a result of random driver behaviours such as speed selection, lane changing, route choice and bus dwell times. The stochastic micro-simulation traffic model in VISSIM attempts to replicate this day-to-day random variability by altering individual driver decisions based on random numbers. The set of random numbers is generated from an initial 'seed' value specified at the start of a simulation run. A single set of random numbers, generated by a single seed value, therefore represents one potential outcome, or one particular day of traffic operation. The actual value of the seed has no significance, however the seeds for different runs must be different from each other in order to produce different outcomes. Based on industry best practice and modelling guidelines, the recommended number of random seed runs is a minimum of 20 (TfL Traffic Modelling Guidelines, Version 4.0).

3.8.2 Model outputs based on 20 runs with different random seeds were considered adequate for the Manorway operational appraisal. This is also consistent with the other VISSIM models developed for LTC.

4 Modelling Results

4.1 Journey Times

4.1.1 Eight key routes were identified for which journey time results were collected. The eight routes are listed below:

1. A13 South to A13 North
2. A13 North to A13 South
3. A13 South to Port Access
4. Port Access to A13 South
5. A13 North to Port Access
6. Port Access to A13 North
7. B1007 to Port Access
8. Port Access to B1007

4.1.2 The routes are shown schematically in the maps in Plate 4-1 to Plate 4-4.

Plate 4-1 Journey time routes 1 and 2

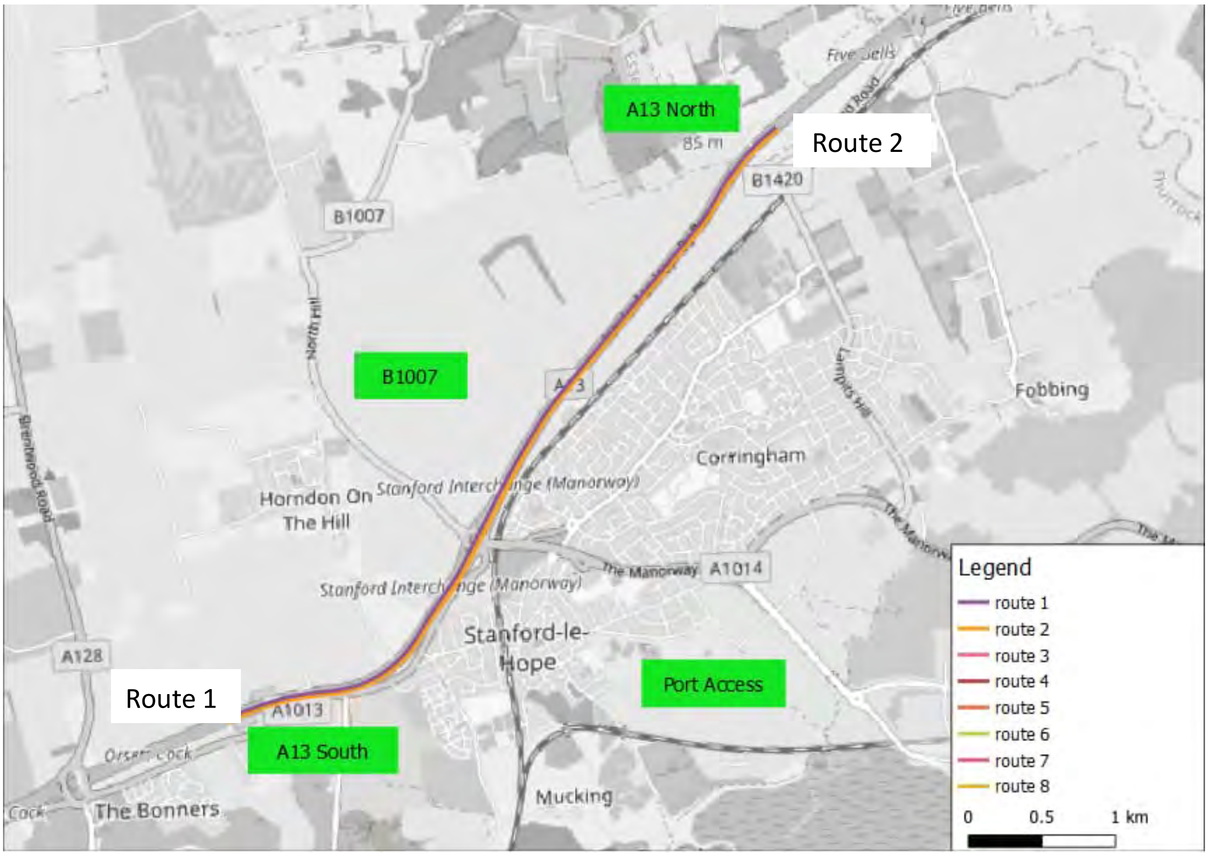


Plate 4-2 Journey time routes 3 and 4

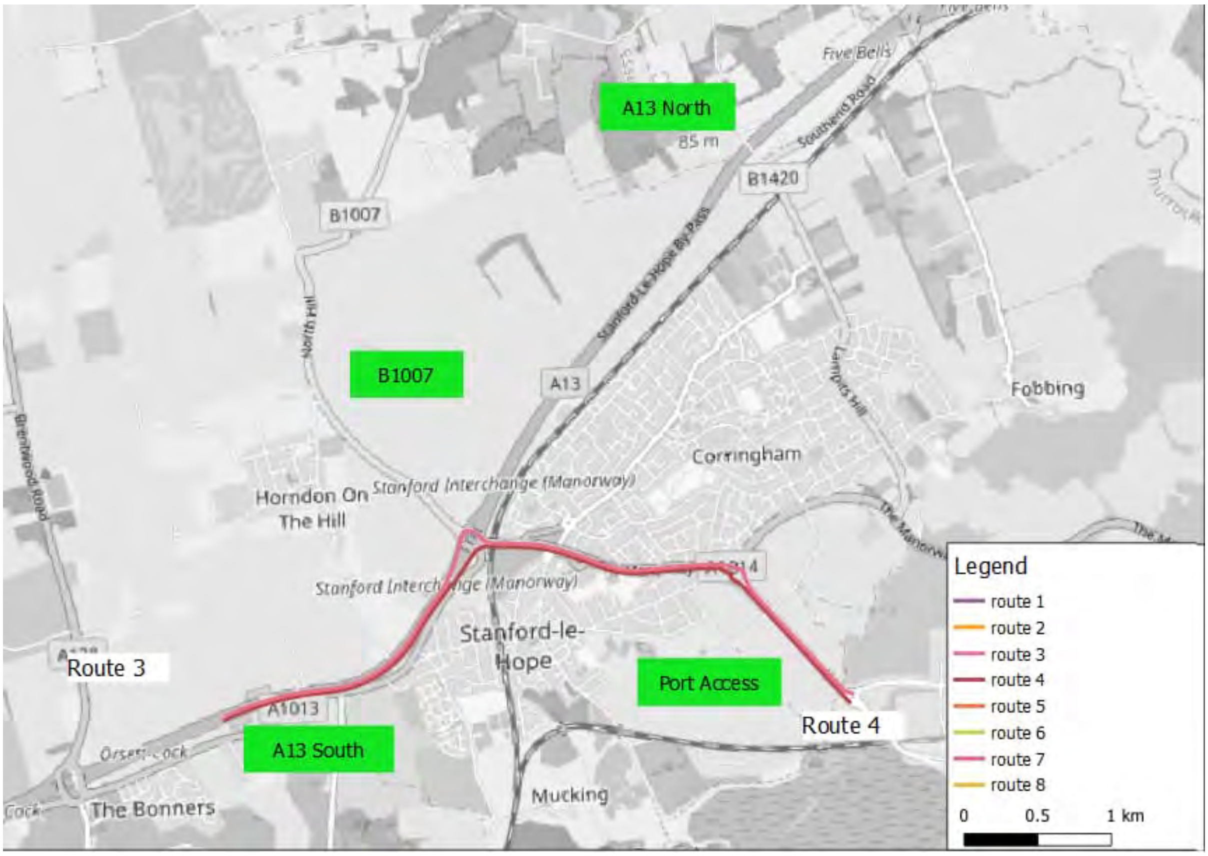


Plate 4-3 Journey time routes 5 and 6

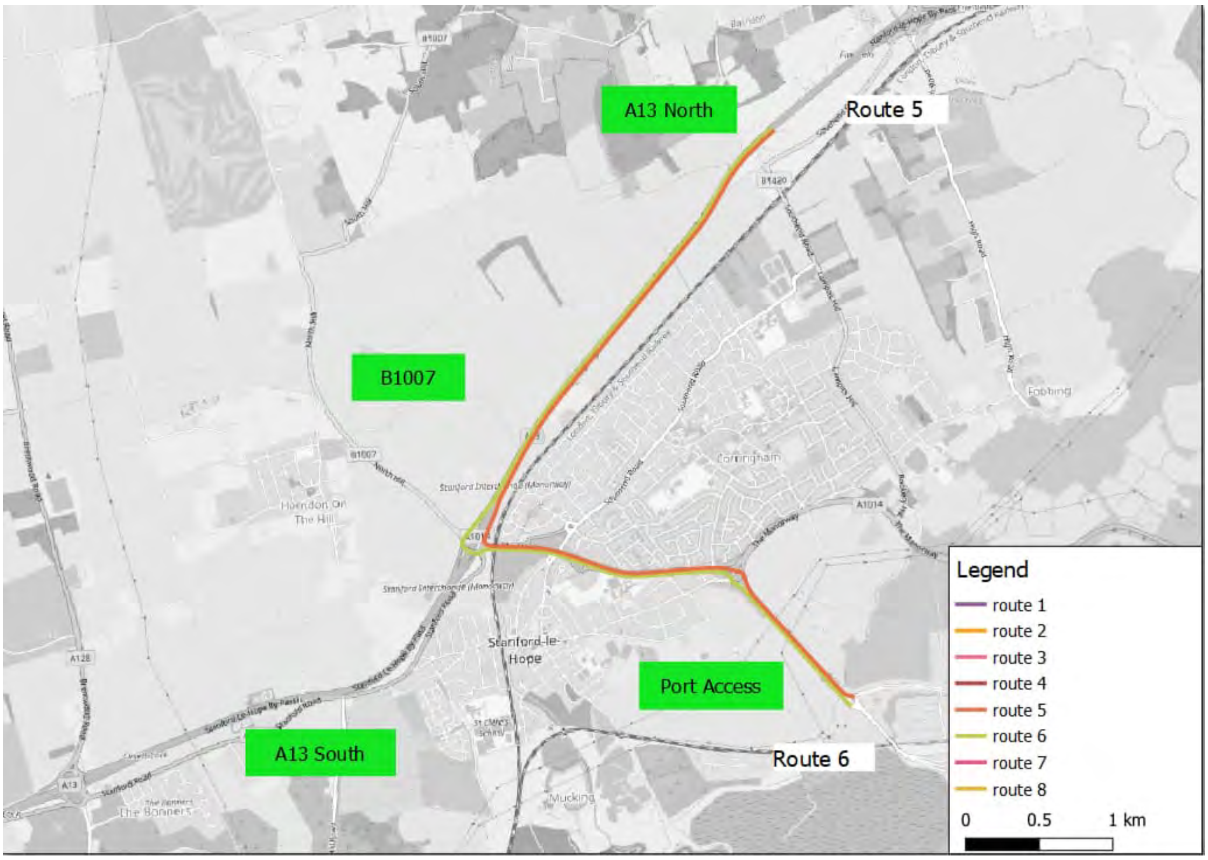
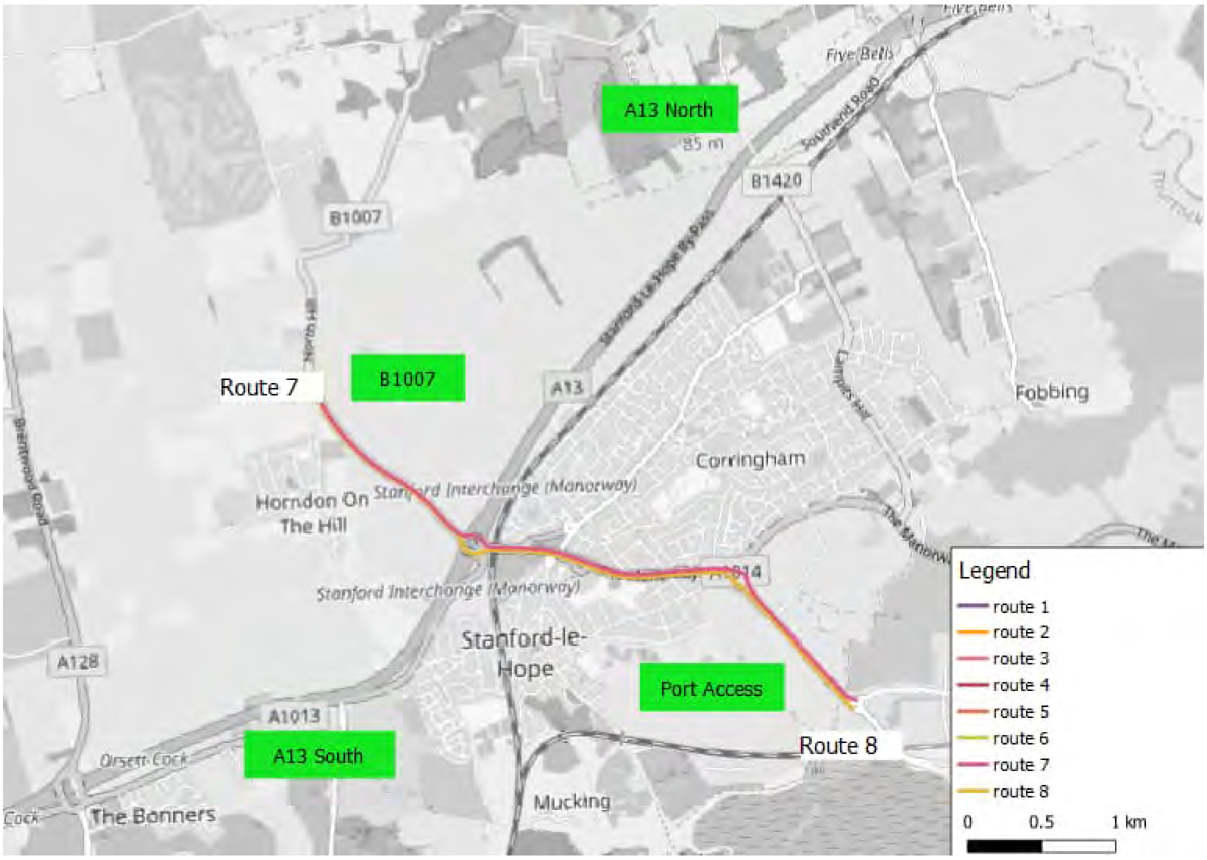


Plate 4-4 Journey time routes 7 and 8



4.1.3 The journey time comparisons between the Do Minimum (without LTC) and Do Something (with LTC) scenarios for the opening year 2030 and design year 2045 in the AM and PM peaks, are presented in Table 4-1 and Table 4-2 respectively.

Table 4-1 Journey times DM v DS – AM Peak

	Journey Times [s]					
	Do-Minimum		Do-Something		Difference (DS-DM)	
Route	2030 AM	2045 AM	2030 AM	2045 AM	2030 AM	2045 AM
1. A13 South to A13 North	103	105	104	106	2	1
2. A13 North to A13 South	111	114	126	135	15	21
3. A13 South to Port Access	238	240	244	242	7	2
4. Port Access to A13 South	225	221	231	239	5	18
5. A13 North to Port Access	205	206	207	213	2	7
6. Port Access to A13 North	258	265	258	264	-1	-2
7. B1007 to Port Access	205	208	209	207	4	0
8. Port Access to B1007	207	202	204	207	-2	5

4.1.4 In the AM peak the model predicts a journey time increase on the A13 southbound of 15 seconds in 2030 and 21 seconds in 2045. The journey time from the Port Access to the A13 South is also predicted to increase by 18 seconds in 2045. The rest of the routes show journey time differences of less than 10 seconds.

Table 4-2 Journey times DM v DS – PM Peak

	Journey Times [s]					
	Do-Minimum		Do-Something		Difference (DS-DM)	
Route	2030 PM	2045 PM	2030 PM	2045 PM	2030 PM	2045 PM
1. A13 South to A13 North	105	105	106	110	2	5
2. A13 North to A13 South	104	109	116	140	13	31
3. A13 South to Port Access	240	242	238	246	-2	3
4. Port Access to A13 South	217	224	232	246	15	22
5. A13 North to Port Access	204	206	207	221	3	15
6. Port Access to A13 North	282	290	276	281	-6	-9
7. B1007 to Port Access	206	211	203	203	-4	-8
8. Port Access to B1007	210	213	216	220	6	7

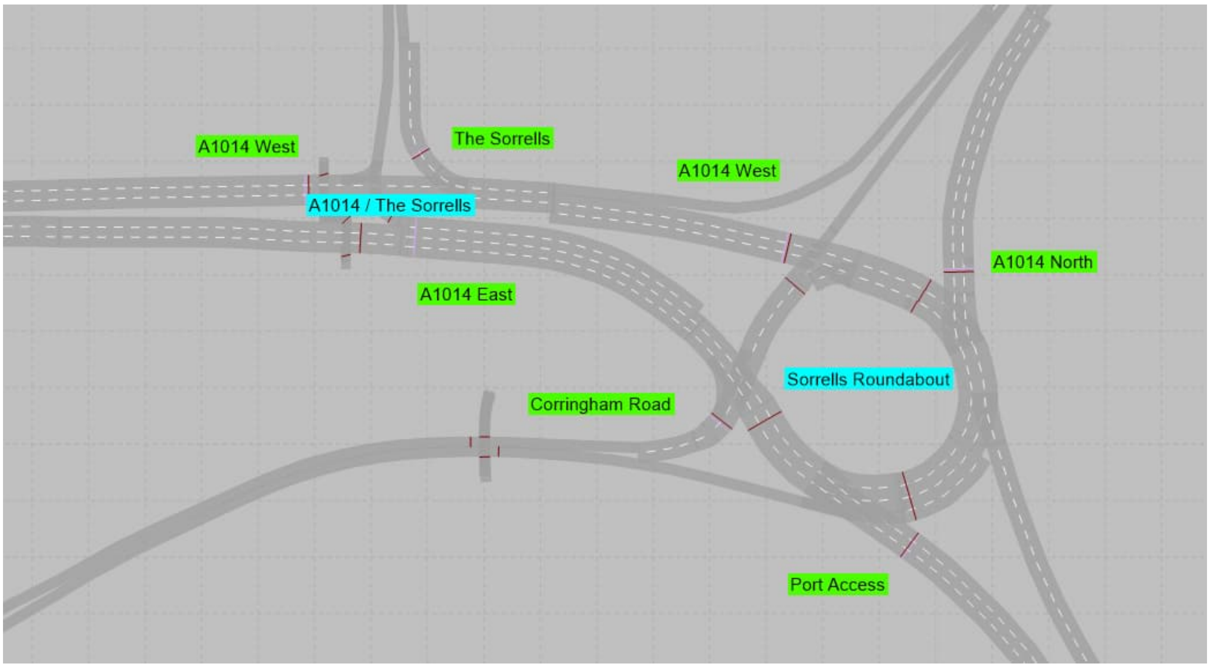
4.1.5 In the PM peak the model predicts a journey time increase on the A13 southbound of 13 seconds in 2030 and 31 seconds in 2045. The journey time from the Port Access to the A13 South is also predicted to increase by 15 seconds and 22 seconds in 2030 and 2045 respectively. Additionally, the journey time from the A13 North to the Port Access increase by 15 seconds. The rest of the routes show journey time differences of less than 10 seconds.

4.2 Queue Length Results

4.2.1 Queue length results have been collected for all junction approaches. The locations of queue counters at the Manorway roundabout are shown in Plate 4-5, and Plate 4-6 shows the locations of queue counters on the A1014 The Manorway and at Sorrells roundabout.

Plate 4-5 Queue counters – Manorway roundabout

Plate 4-6 Queue counters – A1014 The Manorway, The Sorrels & Sorrells roundabout



4.2.2 Queue counters have been located at the stop lines of each approach in the model. VISSIM considers a vehicle to be in a queue when its speed drops below 5kph and to have left a queue when its speed increases above 10kph and stops measuring the queue when there is a gap of more than 20m between two individual vehicles.

4.2.3 The queue length results from the 2030 and 2045 model runs are presented in Plate 4-7 and Plate 4-8 respectively. The graphs show the Mean Max Queue (MMQ) results which is the average of the maximum queue on each approach in 5-minute intervals.

4.2.4 The results indicate similar levels of queuing between Do Minimum (without LTC) and Do Something (with LTC) scenarios, with differences of less than four vehicles predicted at each of the individual approaches of all the three modelled junctions.

Plate 4-7 Mean Max Queue - 2030

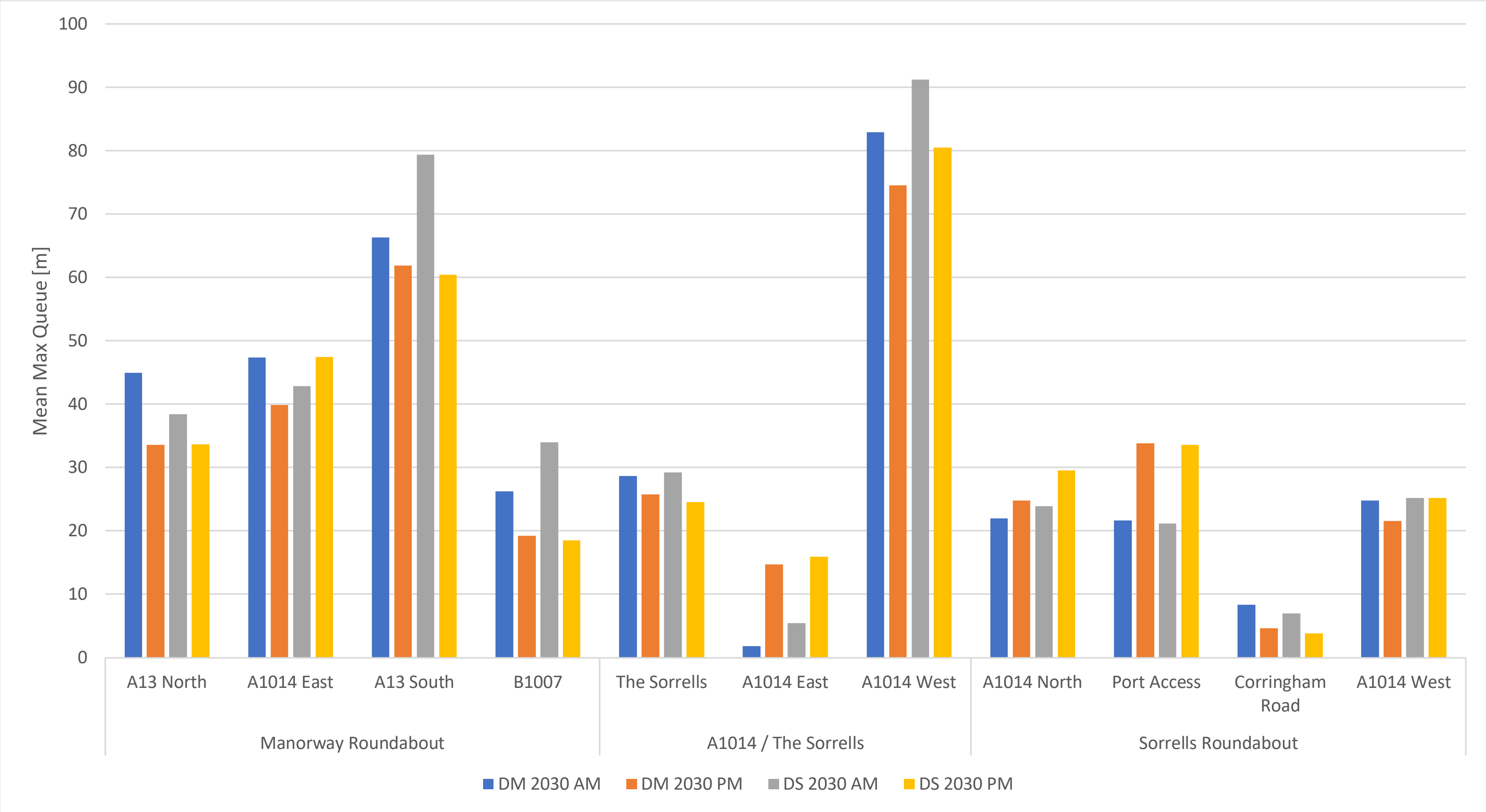
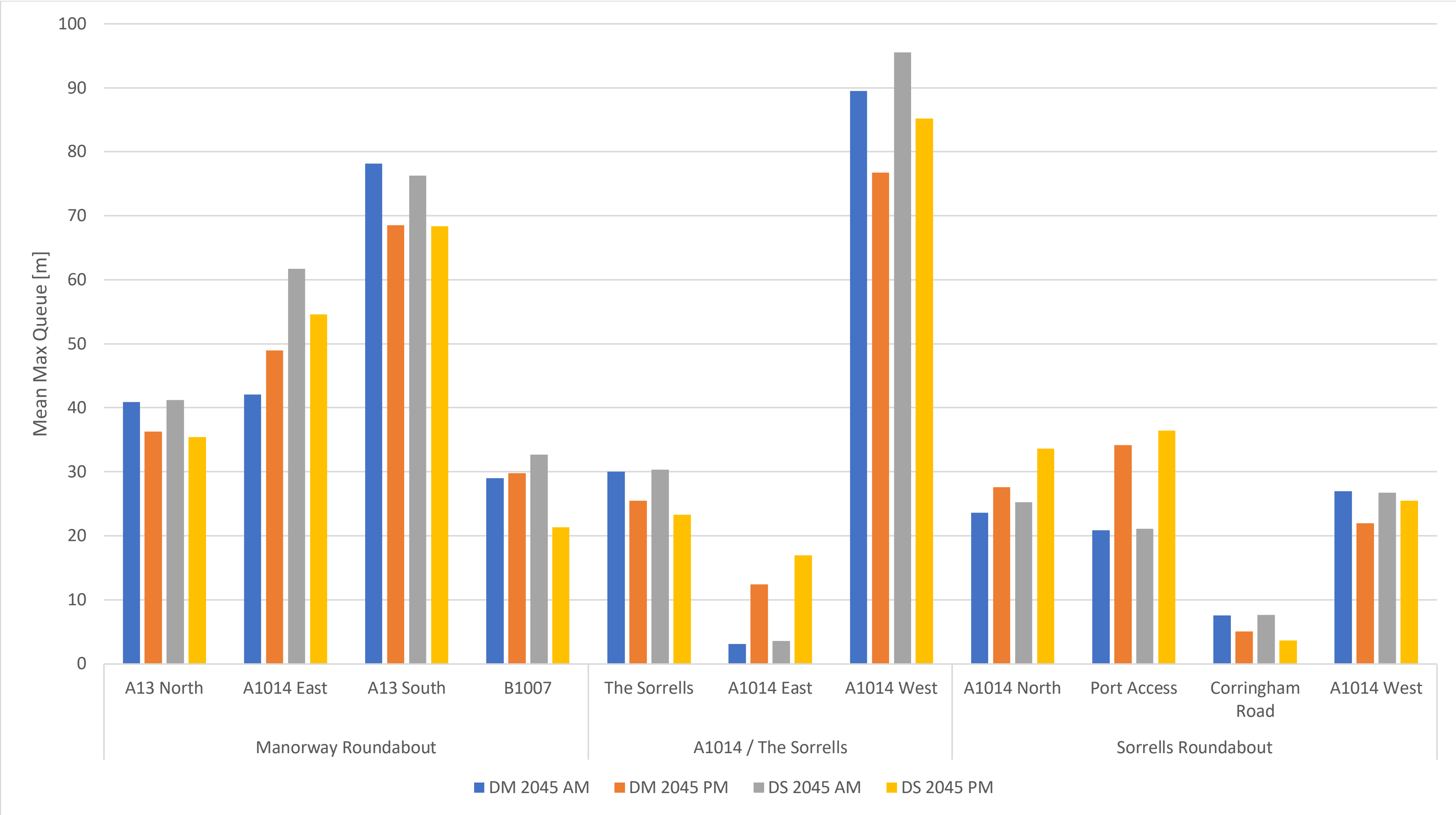


Plate 4-8 Mean Max Queue - 2045



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4.3 Junction Results

4.3.1 The node evaluation or predicted performance results at junctions for the 2030 Do Minimum and Do Something, and 2045 Do Minimum and Do Something scenarios, are shown in Table 4-3 and Table 4-4 respectively, and have been measured in terms of the difference (with LTC minus without LTC) of the following:

- Predicted total hourly throughput flow in vehicles;
- Average delay in seconds for each route from an approach; and
- Average approach delay which is the average of all delays originating from the approach along all possible routes.

4.3.2 The average values for flows and delays are the weighted average of all 20 random seed runs.

Table 4-3 Flows and Delays for 2030

			DM 2030 AM		DM 2030 PM		DS 2030 AM		DS 2030 PM		AM Difference		PM Difference	
Junction	Approach	To	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)
Manorway Roundabout	A13 North (off-slip)	A13 North (on-slip)	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		A1014 East	371	21.7	353	19.4	313	20.7	294	21.7	-58	-1.0	-59	2.3
		A1013 South	71	30.2	91	30.7	86	37.0	106	33.6	15	6.8	15	2.9
		B1007 West	15	48.6	11	50.5	11	49.2	10	55.8	-4	0.6	-1	5.3
		Average approach delay										2.2		3.5
	A1014 East	A1014 East	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		A1013 South	34	7.7	77	4.8	33	6.3	72	5.2	-1	-1.5	-5	0.5
		A13 South (on-slip)	1012	7.8	1206	4.6	1295	6.3	1628	5.7	283	-1.4	422	1.1
		B1007 West	81	12.1	428	14.6	75	12.8	351	19.5	-6	0.7	-77	4.9
		A13 North (on-slip)	418	14.0	563	13.9	365	13.1	228	16.0	-53	-0.9	-335	2.1
		Average approach delay										-0.8		2.1

			DM 2030 AM		DM 2030 PM		DS 2030 AM		DS 2030 PM		AM Difference		PM Difference	
Junction	Approach	To	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)
	A1013 South	A1013 South	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		A13 South (on-slip)	0	0.0	0	0.0	83	7.9	120	10.2	83	7.9	120	10.2
		B1007 West	38	17.5	74	24.5	31	20.7	107	33.7	-7	3.2	33	9.2
		A13 North (on-slip)	255	24.9	176	30.6	199	31.5	47	33.2	-56	6.6	-129	2.6
		A1014 East	77	29.9	31	34.1	80	35.2	46	35.1	3	5.2	15	1.0
		Average approach delay										5.7		5.7
	A13 South (off-slip)	A13 South (on-slip)	0	0.0	0	0.0	35	48.3	27	41.9	35	48.3	27	41.9
		B1007 West	408	13.9	452	14.5	415	13.9	408	10.2	7	-0.1	-44	-4.3
		A1014 East	1101	17.9	1012	17.6	1266	22.4	1197	13.8	165	4.5	185	-3.8
		A1013 South	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		Average approach delay										17.6		11.2
	B1007 West	B1007 West	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		A13 North (on-slip)	24	4.9	25	5.3	23	4.8	18	3.7	-1	-0.1	-7	-1.6
		A1014 East	184	11.9	257	12.4	69	12.1	225	8.9	-115	0.1	-32	-3.5
		A1013 South	50	42.3	30	41.2	41	48.7	45	36.6	-9	6.5	15	-4.5
		A13 South (on-slip)	318	39.8	209	40.3	443	45.3	237	34.7	125	5.5	28	-5.6
		Average approach delay										3.0		-3.8
A1014 / The Sorrells	The Sorrels	A1014 East	191	21.7	171	20.4	198	20.6	175	19.3	7	-1.2	4	-1.1
		Average approach delay										-1.2		-1.1
	A1014 East	A1014 West	907	1.2	1727	4.9	965	3.6	1671	5.0	58	2.4	-56	0.1
		The Sorrels	15	19.1	66	18.6	14	18.2	88	18.7	-1	-0.9	22	0.1
		Average approach delay										0.8		0.1
	A1014 West	The Sorrels	59	13.1	189	14.1	60	14.4	163	15.5	1	1.3	-26	1.4
		A1014 East	1347	10.4	739	11.2	1354	11.3	865	12.8	7	0.9	126	1.6
		Average approach delay										1.1		1.5

			DM 2030 AM		DM 2030 PM		DS 2030 AM		DS 2030 PM		AM Difference		PM Difference	
Junction	Approach	To	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)
Sorrells Roundabout	A1014 North	A1014 North	15	14.8	32	22.4	15	20.8	104	27.4	0	6.0	72	5.0
		Port Access	66	9.5	15	8.0	123	10.1	14	8.7	57	0.6	-1	0.8
		Corringham Rd	19	9.0	29	10.8	18	11.8	27	12.3	-1	2.8	-2	1.5
		A1014 West	487	10.7	773	19.3	547	18.4	796	20.6	60	7.7	23	1.3
		Average approach delay										4.3		2.1
	Port Access	Port Access	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		Corringham Rd	4	8.3	29	8.3	4	8.1	28	8.1	0	-0.2	-1	-0.2
		A1014 West	283	16.9	861	11.4	283	10.2	812	11.5	0	-6.7	-49	0.1
		A1014 North	16	28.7	40	24.4	16	24.2	87	26.4	0	-4.5	47	2.0
		Average approach delay										-3.8		0.6
	Corringham Rd	Corringham Rd	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		A1014 West	9	10.2	13	9.8	9	9.5	10	8.4	0	-0.7	-3	-1.4
		A1014 North	37	21.8	13	22.6	37	21.0	12	19.9	0	-0.9	-1	-2.7
		Port Access	22	29.6	2	33.5	20	33.3	2	32.4	-2	3.7	0	-1.1
		Average approach delay										0.7		-1.7
	A1014 West	A1014 West	144	24.7	149	38.6	140	33.4	144	38.9	-4	8.7	-5	0.4
		A1014 North	618	0.9	400	0.6	689	0.9	527	0.8	71	0.1	127	0.1
		Port Access	763	5.0	313	5.0	710	5.1	316	5.0	-53	0.1	3	-0.1
		Corringham Rd	13	28.6	47	18.0	12	29.8	52	18.8	-1	1.1	5	0.9
		Average approach delay										2.5		0.3

Table 4-4 Flows and Delays for 2045

			DM 2045 AM		DM 2045 PM		DS 2045 AM		DS 2045 PM		AM Difference		PM Difference	
Junction	Approach	To	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)
Manorway Roundabout	A13 North (off-slip)	A13 North (on-slip)	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		A1014 East	386	21.2	387	19.3	301	23.6	228	25.8	-85	2.5	-159	6.6
		A1013 South	89	32.0	108	32.6	106	31.8	98	33.1	17	-0.2	-10	0.6
		B1007 West	16	50.1	13	50.8	8	48.1	8	49.5	-8	-2.0	-5	-1.3
		Average approach delay										0.1		2.0
	A1014 East	A1014 East	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		A1013 South	41	6.0	100	5.7	47	8.9	109	6.5	6	2.8	9	0.8
		A13 South (on-slip)	1136	6.1	1300	5.7	1436	8.3	1704	6.9	300	2.2	404	1.2
		B1007 West	112	12.8	508	16.6	139	15.2	448	20.8	27	2.4	-60	4.2
		A13 North (on-slip)	397	13.4	558	15.4	233	13.3	93	17.5	-164	-0.1	-465	2.1
		Average approach delay										1.8		2.1
	A1013 South	A1013 South	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		A13 South (on-slip)	0	0.0	0	0.0	86	9.0	95	11.4	86	9.0	95	11.4
		B1007 West	51	17.6	91	27.1	58	26.2	111	32.3	7	8.6	20	5.1
		A13 North (on-slip)	307	31.2	119	32.0	154	32.2	41	29.7	-153	1.0	-78	-2.3
		A1014 East	98	37.6	39	34.7	86	34.7	80	30.8	-12	-2.9	41	-3.9
		Average approach delay										3.9		2.6
	A13 South (off-slip)	A13 South (on-slip)	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		B1007 West	481	14.5	438	14.4	360	11.4	416	11.8	-121	-3.1	-22	-2.6
		A1014 East	1196	19.3	1123	19.2	1381	20.2	1258	16.6	185	0.9	135	-2.7
		A1013 South	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		Average approach delay										-1.1		-2.6

Junction	Approach	To	DM 2045 AM Flow (veh)	DM 2045 AM Delay (s)	DM 2045 PM Flow (veh)	DM 2045 PM Delay (s)	DS 2045 AM Flow (veh)	DS 2045 AM Delay (s)	DS 2045 PM Flow (veh)	DS 2045 PM Delay (s)	AM Difference Flow (veh)	AM Difference Delay (s)	PM Difference Flow (veh)	PM Difference Delay (s)
	B1007 West	B1007 West	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		A13 North (on-slip)	29	5.8	28	6.1	23	4.2	17	3.5	-6	-1.6	-11	-2.6
		A1014 East	126	12.1	237	14.2	76	10.8	312	7.9	-50	-1.2	75	-6.3
		A1013 South	48	43.8	39	45.2	53	41.3	75	31.1	5	-2.5	36	-14.1
		A13 South (on-slip)	352	41.7	237	43.3	464	39.1	229	30.6	112	-2.7	-8	-12.8
		Average approach delay										-2.0		-8.9
A1014 / The Sorrells	The Sorrells	A1014 East	205	21.0	171	20.0	212	20.9	171	19.1	7	-0.1	0	-0.9
		Average approach delay										-0.1		-0.9
	A1014 East	A1014 West	950	3.0	1810	4.6	983	3.0	1654	5.1	33	0.0	-156	0.4
		The Sorrells	14	17.9	63	18.9	13	18.7	97	18.4	-1	0.8	34	-0.5
		Average approach delay										0.4		0.0
	A1014 West	The Sorrells	60	13.0	190	14.5	60	11.1	153	16.7	0	-2.0	-37	2.2
		A1014 East	1375	10.5	841	11.6	1488	9.5	1016	13.9	113	-1.0	175	2.3
		Average approach delay										-1.5		2.2
Sorrells Roundabout	A1014 North	A1014 North	16	20.1	33	25.6	44	21.1	158	27.6	28	1.0	125	2.0
		Port Access	86	9.5	15	8.0	107	9.7	14	9.0	21	0.2	-1	1.0
		Corringham Rd	22	11.5	31	12.4	19	11.8	28	11.6	-3	0.3	-3	-0.8
		A1014 West	532	17.6	854	20.2	559	17.6	842	19.9	27	0.1	-12	-0.3
		Average approach delay										0.4		0.5
	Port Access	Port Access	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		Corringham Rd	4	8.1	28	8.6	3	9.4	28	8.5	-1	1.2	0	-0.1
		A1014 West	282	10.0	858	11.7	284	10.8	768	12.8	2	0.7	-90	1.1
		A1014 North	16	20.6	41	17.9	15	20.7	128	29.3	-1	0.1	87	11.4
		Average approach delay										0.7		4.1

			DM 2045 AM		DM 2045 PM		DS 2045 AM		DS 2045 PM		AM Difference		PM Difference	
Junction	Approach	To	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)
	Corringham Rd	Corringham Rd	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		A1014 West	9	8.9	13	8.6	9	10.4	9	9.4	0	1.6	-4	0.7
		A1014 North	39	22.8	16	24.6	37	23.3	9	20.9	-2	0.5	-7	-3.7
		Port Access	21	33.1	2	39.0	20	33.4	2	32.5	-1	0.2	0	-6.5
		Average approach delay										0.8		-3.2
	A1014 West	A1014 West	141	34.6	150	37.1	145	34.6	136	39.1	4	0.0	-14	2.0
		A1014 North	697	1.0	439	0.7	803	1.0	613	0.9	106	0.1	174	0.2
		Port Access	729	5.9	303	6.5	706	6.1	307	5.0	-23	0.2	4	-1.5
		Corringham Rd	13	29.4	119	16.6	45	17.4	131	17.6	32	-12.0	12	1.0
		Average approach delay										-2.9		0.4

4.3.3 The junction results indicate similar levels of delay between the Do Minimum and Do Something scenarios for the 2030 and 2045 future years, in the AM and PM peak periods for the listed routes at the junctions.

4.3.4 In 2030 the modelling predicts that at the Manorway roundabout the A13 South approach (off-slip) would experience an increase in average approach delay of approx. 18 seconds in the AM and approx. 12 seconds in the PM. The respective average approach delays on all the other approaches vary between a maximum increase of approx. 6 seconds and a maximum reduction of approx. 4 seconds.

4.3.5 At the A1014 The Manorway/ The Sorrells junction in 2030, the respective average approach delays vary between a maximum increase of approx. 2 seconds and a maximum reduction of approx. 2 seconds. At Sorrells roundabout it varies between a maximum of 5 seconds increase and a maximum of 4 seconds reduction.

4.3.6 In 2045 the modelling predicts that at the Manorway roundabout the A1013 approach would experience an increase in average approach delay of approx. 4 seconds in the AM and approx. 3 seconds in the PM. The respective average approach delays on all the other approaches vary between a maximum increase of approx. 2-3 seconds and a maximum reduction of approx. 8-9 seconds.

4.3.7 At the A1014 The Manorway/ The Sorrells junction in 2045, the respective average approach delays vary between a maximum increase of approx. 3 seconds and a maximum reduction of approx. 2 seconds. At Sorrells roundabout it varies between a maximum of 5 seconds increase and a maximum of 4 seconds reduction.

5 Sensitivity Tests

5.1 Introduction

5.1.1 As shown in the modelling results analysis in the previous chapter, the VISSIM modelling is not predicting any noticeable changes to the delays with the introduction of the LTC scheme. Particularly in 2045 on the A13 North on-slip (northbound on-slip) the model predicts free-flow conditions both in the Do Minimum (without LTC) and Do Something (with LTC) scenarios, as shown in the relative delay plots in Plate A.7 and Plate A.8 in Appendix A.

5.1.2 LTAM in 2045 however, as shown in Plate 5-1 and Plate 5-2 respectively, predicts additional delays of 65s in the AM Peak and 210s in the PM Peak with the introduction of LTC compared to without LTC.

Plate 5-1 LTAM 2045 DS v DM Delay Difference – AM Peak

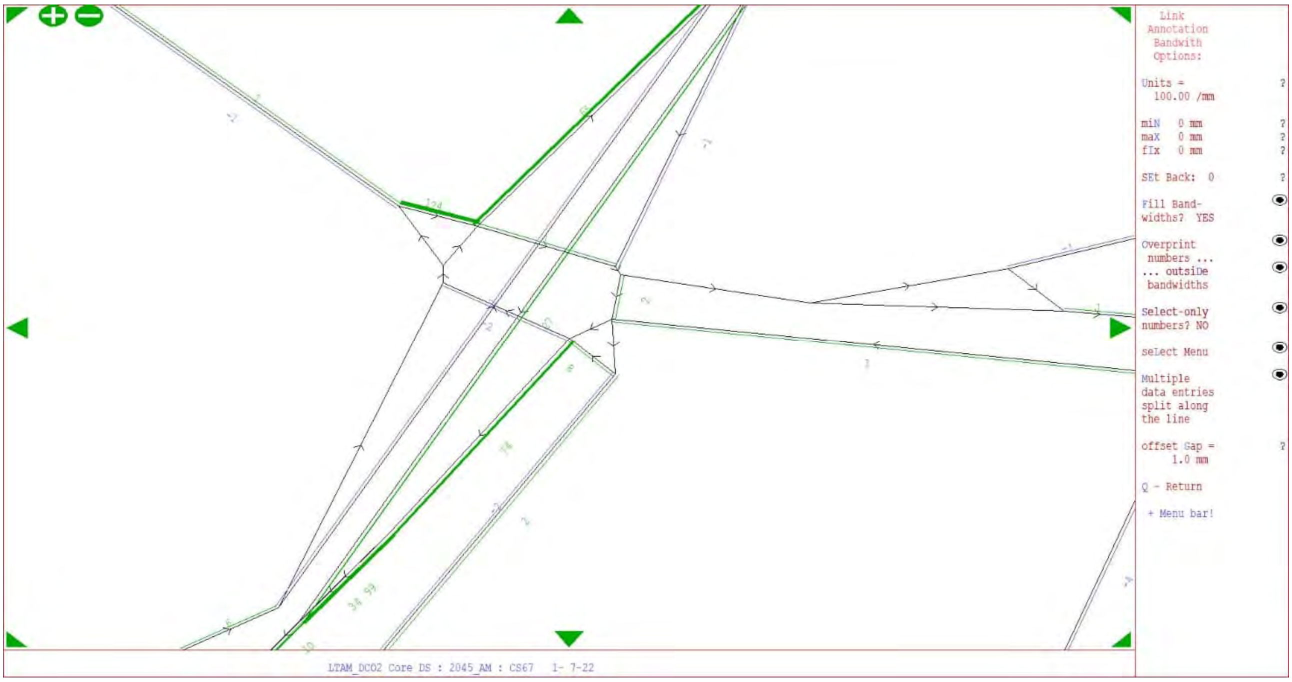
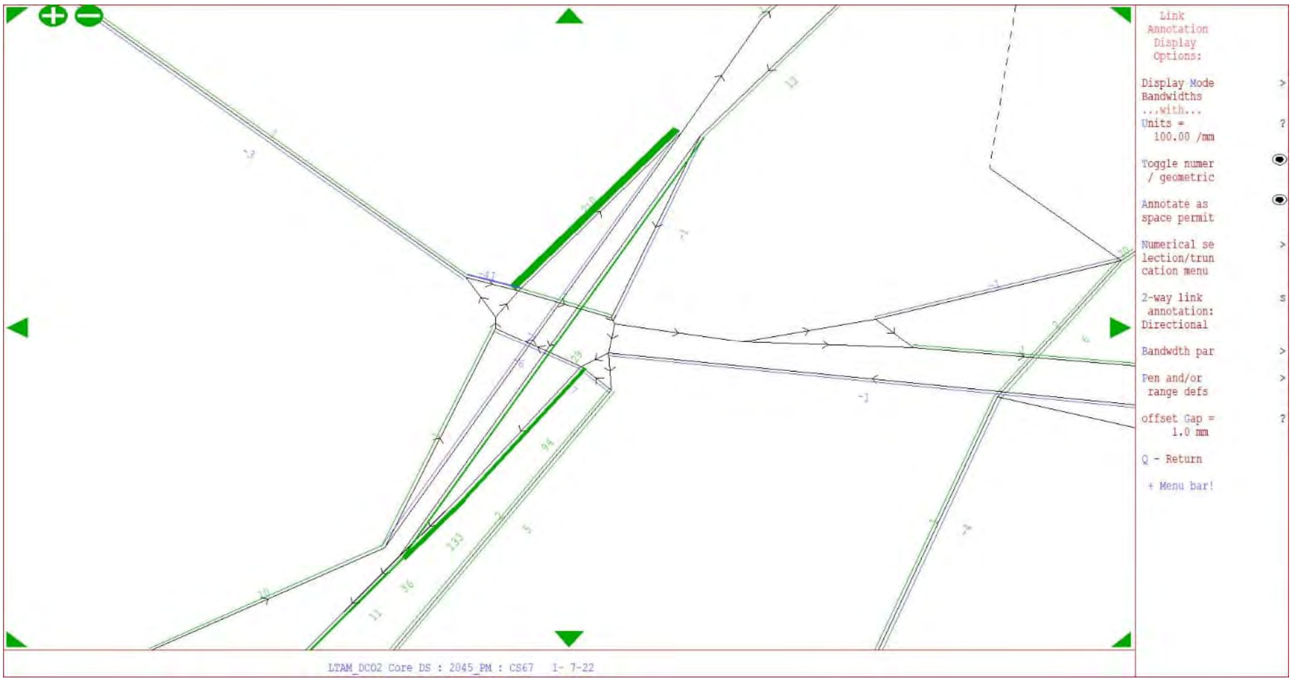


Plate 5-2 LTAM 2045 DS v DM Delay Difference – PM Peak



5.1.3 These delays on the A13 North on-slip suppress the flows accessing the A13 northbound via the slip road. Plate 5-3 and Plate 5-4 show the flow differences between Do Minimum and Do Something scenarios on A13 North on-slip specifically – the LTAM 2045 forecast shows approx. 400 less Passenger Car Units (PCU) in the AM peak and approx. 550 less PCUs in the PM peak in the Do Something model compared to the Do Minimum model.

Plate 5-3 LTAM 2045 DS v DM Flow Difference – AM Peak

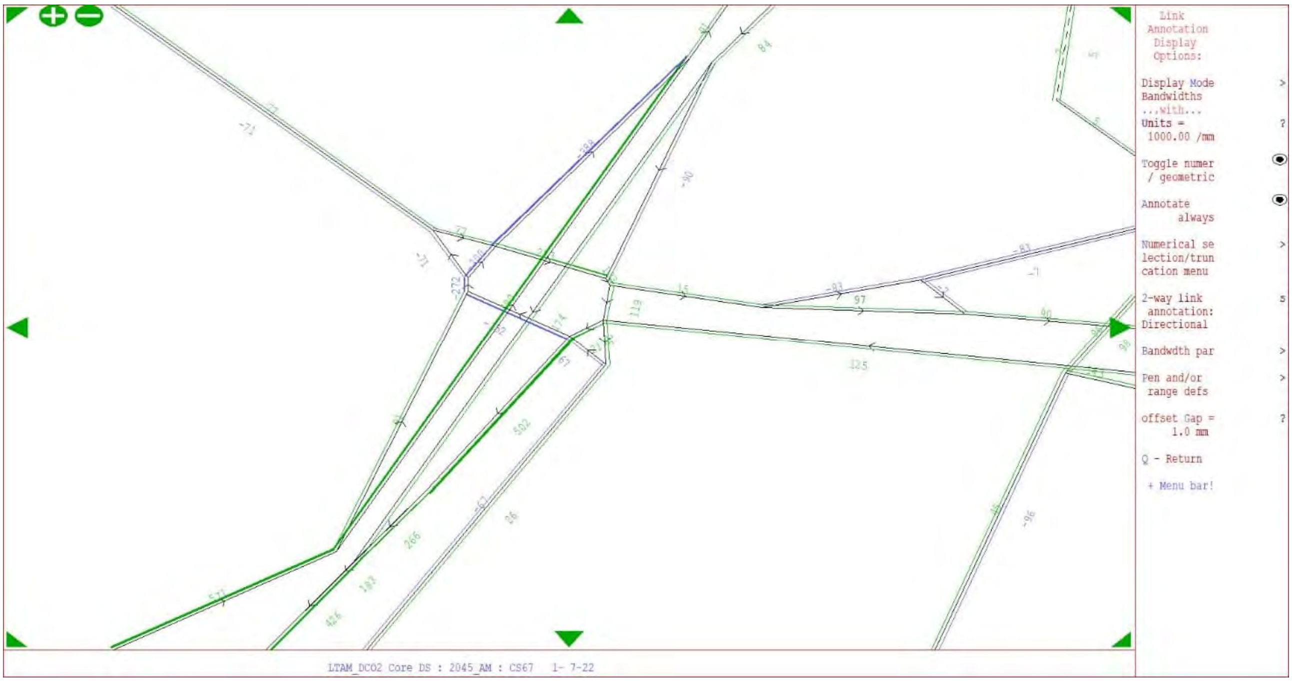


Plate 5-4 LTAM 2045 DS v DM Flow Difference – PM Peak

5.1.4 The traffic suppression in LTAM is caused by the delays observed on the A13 North on-slip, which leads to traffic seeking alternative routes. Since VISSIM is not predicting similar delays on the slip road, it can be anticipated that more traffic would use the slip road to access the A13 northbound.

5.1.5 Therefore, a number of sensitivity tests were carried out, incrementally increasing the traffic volume on the A13 North on-slip. The additional flows were applied as a proportion of the flow difference between the Do Minimum and Do Something scenarios on the A13 North on-slip, distributed to originate proportionally from all zones.

5.1.6 The additional traffic was implemented only for Cars as the flow differences in LGVs and HGVs between the Do Minimum and Do Something scenarios were negligible, indicating that it is the cars that mainly reroute to avoid the delay on the A13 North on-slip.

5.1.7 The sensitivity modelling scenarios tested are summarised below:

- DS 2045 AM +35% (approx. +130 PCUs)
- DS 2045 AM +70% (approx. +275 PCUs)
- DS 2045 PM +25% (approx. +150 PCUs)
- DS 2045 PM +50% (approx. +250 PCUs)
- DS 2045 PM +70% (approx. +400 PCUs)

5.1.8 This analysis has only been carried out for the design year 2045 as the forecast flows are higher, giving an upper limit.

5.2 Journey Time Results

5.2.1 The journey time results for the 8 key routes as defined in Section 4.1 and shown in Plate 5-5 below, are summarised in Table 5-1 and Table 5-2 for the AM and PM peaks respectively.

Plate 5-5 Key 8 Journey Time Routes

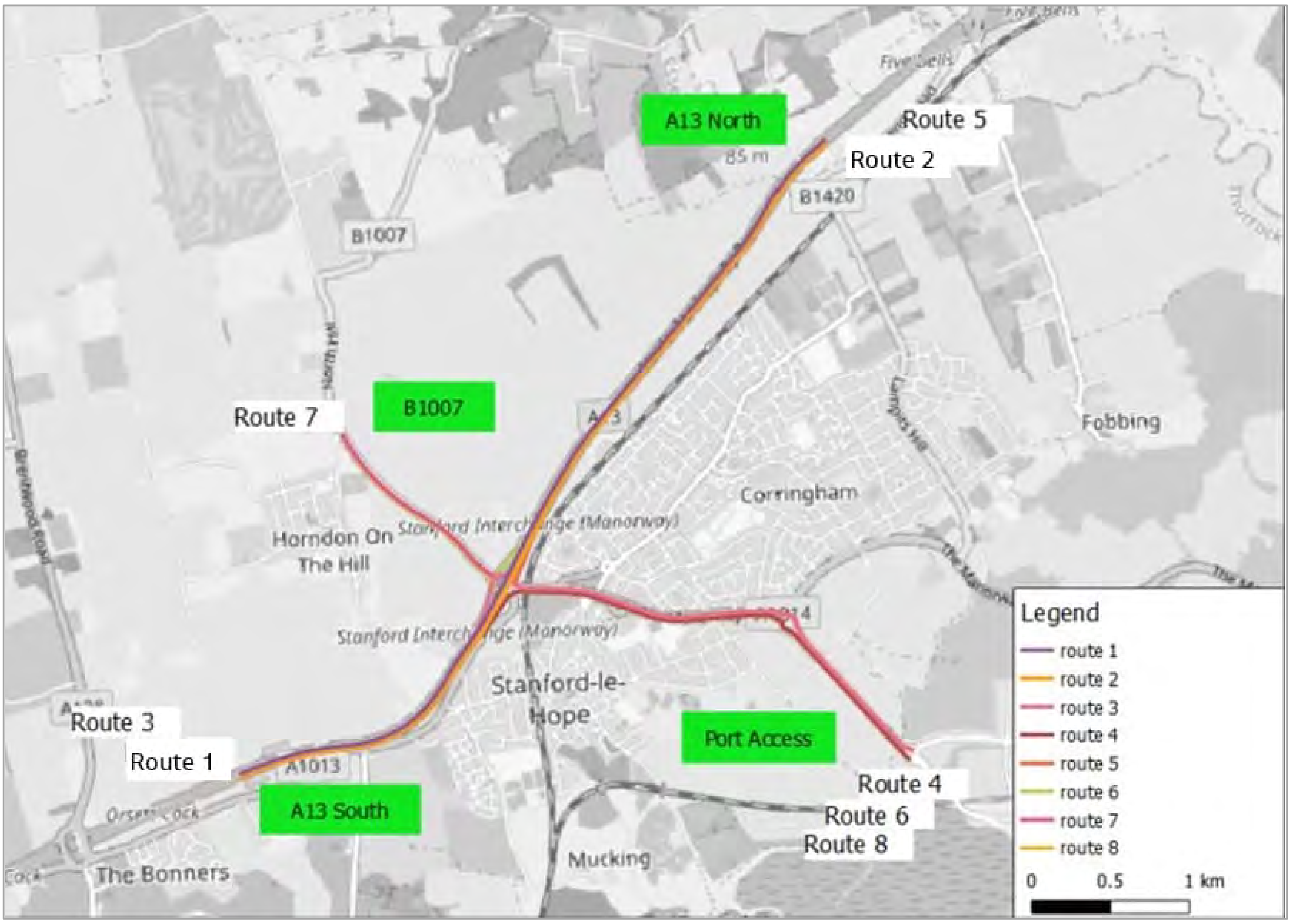


Table 5-1 Journey times – 2045 AM

	Journey Times [s]						
	Core Scenarios		Sensitivity Test		Difference		
Route	DM 2045 AM	DS 2045 AM	DS 2045 AM +35%	DS 2045 AM +70%	DS 2045 AM	DS 2045 AM +35%	DS 2045 AM +70%
1. A13 South to A13 North	105	106	106	108	1	1	3
2. A13 North to A13 South	114	135	135	131	21	21	17
3. A13 South to Port Access	240	242	243	246	2	2	6
4. Port Access to A13 South	221	239	239	240	18	18	19
5. A13 North to Port Access	206	213	213	211	7	7	6
6. Port Access to A13 North	265	264	262	386	-2	-4	121
7. B1007 to Port Access	208	207	208	259	0	0	52
8. Port Access to B1007	202	207	207	215	5	5	13

5.2.2 Table 5-1 shows the journey time results in the AM peak comparing the Do Minimum with the core Do Something, with the +35% Do Something sensitivity test and with the +70% Do Something sensitivity test.

5.2.3 The results indicate that the addition of the approx. 130 PCUs (in the Do Something +35% modelling scenario) has negligible changes to the journey times.

5.2.4 Doubling the amount of additional traffic (in the Do Something +70% modelling scenario) the journey time increases noticeably on route 6 (from the Port Access to the A13 North on-slip) by approx. 2 minutes, as vehicles are queueing on A13 North on-slip to access the A13 northbound. This is shown in the relative delay plot in Plate A.9. Noticeable delay is also observed on route 7 (from the B1007 to the Port Access) as the queue on A13 North on-slip is blocking back to the Manorway roundabout.

Table 5-2 Journey times – 2045 PM

	Journey Times [s]								
	Core Scenarios		Sensitivity Test			Difference			
Route	DM 2045 PM	DS 2045 PM	DS 2045 PM +25%	DS 2045 PM +50%	DS 2045 PM +70%	DS 2045 PM	DS 2045 PM +25%	DS 2045 PM +50%	DS 2045 PM +70%
1. A13 South to A13 North	105	110	109	111	112	5	4	6	7
2. A13 North to A13 South	109	140	133	133	131	31	24	25	22
3. A13 South to Port Access	242	246	244	246	257	3	2	4	15
4. Port Access to A13 South	224	246	247	248	328	22	24	25	104
5. A13 North to Port Access	206	221	218	219	215	15	12	13	9
6. Port Access to A13 North	290	281	289	423	726	-9	-1	133	436
7. B1007 to Port Access	211	203	204	225	304	-8	-8	14	93
8. Port Access to B1007	213	220	221	223	332	7	8	10	119

5.2.5 In the PM peak, three sensitivity tests have been carried out, adding approx. 150, 250 and 400 PCUs respectively to the core Do Something flows.

5.2.6 In the Do Something +25% modelling scenario the results are similar to the core Do Something scenario, while in the Do Something +50% modelling scenario there is a noticeable journey time increase in route 6 of more than 2 minutes. Similar to the AM peak the additional traffic on the A13 North on-slip is causing the delay. This is shown in the relative delay plot in Appendix A.

5.2.7 In the final sensitivity test, the Do Something +70% modelling scenario, the delay increases considerably, with route 6 showing an increase in journey time compared to the Do Minimum scenario of over 7 minutes, while routes 7 and 8 (from the Port Access to the B1007 and vice versa) also show journey time increases of approx. 1.5 minutes and approx. 2 minutes respectively. This occurs as the queue on the A13 North on-slip blocks back to Manorway roundabout. This is demonstrated in the relative delay plot in Plate A.13.

5.2.8 The queue and delay results for all the sensitivity tests are shown in Appendix B.

6 Conclusion

6.1.1 This report describes the development of the 2030 and 2045 Do Minimum (without LTC) and Do Something (with LTC) VISSIM operational assessment of the Manorway study area, which includes the Manorway roundabout.

6.1.2 The results of the models are analysed in comparison, evaluating the impact of the introduction of the LTC scheme on the network traffic conditions.

6.1.3 The journey time results show modest journey time increases on the A13 southbound mainline and the A13 South on-slip (southbound on-slip) in 2030 and 2045, in both the AM and PM peak hours. The journey time from the A13 South off-slip to the Port Access also increases in 2045 in the PM peak by 15 seconds. All other routes show little journey time changes.

6.1.4 The LTAM model suppress traffic using the A13 North on-slip to access the A13 northbound mainline due to predicted congestion on the slip road in the model – the LTAM 2045 forecast diverts approx. 400 Passenger Car Units (PCUs) or cars in the AM peak and approx. 550 PCUs (cars) in the PM peak away from the A13 North on-slip. The remaining PCUs on the A13 North on-slip are HGVs.

6.1.5 However, the VISSIM modelling predicts that the slip road is not congested and can accommodate more traffic using the slip road to access the A13 northbound mainline.

6.1.6 A series of sensitivity tests (in VISSIM) have been carried out to introduce additional traffic on the A13 North on-slip in the Do Something scenario.

6.1.7 The sensitivity tests carried out (for 2045 only) show that adding 275 PCUs in the AM peak and 250 PCUs in the PM peak results in the slip road operating at capacity with delays of similar magnitude as suggested in LTAM. This is less than the LTAM predicted diverted traffic from the A13 North on-slip (LTAM 2045 Do Minimum – Do Something forecast).

Appendix A – Relative Delay Plots

Plate A.1 DM 2030 AM

Plate A.2 DM 2030 PM

Plate A.3 DM 2045 AM

Plate A.4 DM 2045 PM

Plate A.5 DS 2030 AM

Plate A.6 DS 2030 PM

Plate A.7 DS 2045 AM

Plate A.8 DS 2045 PM

Plate A.9 Sensitivity Test DS 2045 AM +35%

Plate A.10 Sensitivity Test DS 2045 AM +70%

Plate A.11 Sensitivity Test DS 2045 PM +25%

Plate A.12 Sensitivity Test DS 2045 PM +50%

Plate A.13 Sensitivity Test DS 2045 PM +70%

Appendix B – Sensitivity Tests Queue and Junction Results

Plate B.1 Sensitivity Tests – Mean Max Queue AM Peak

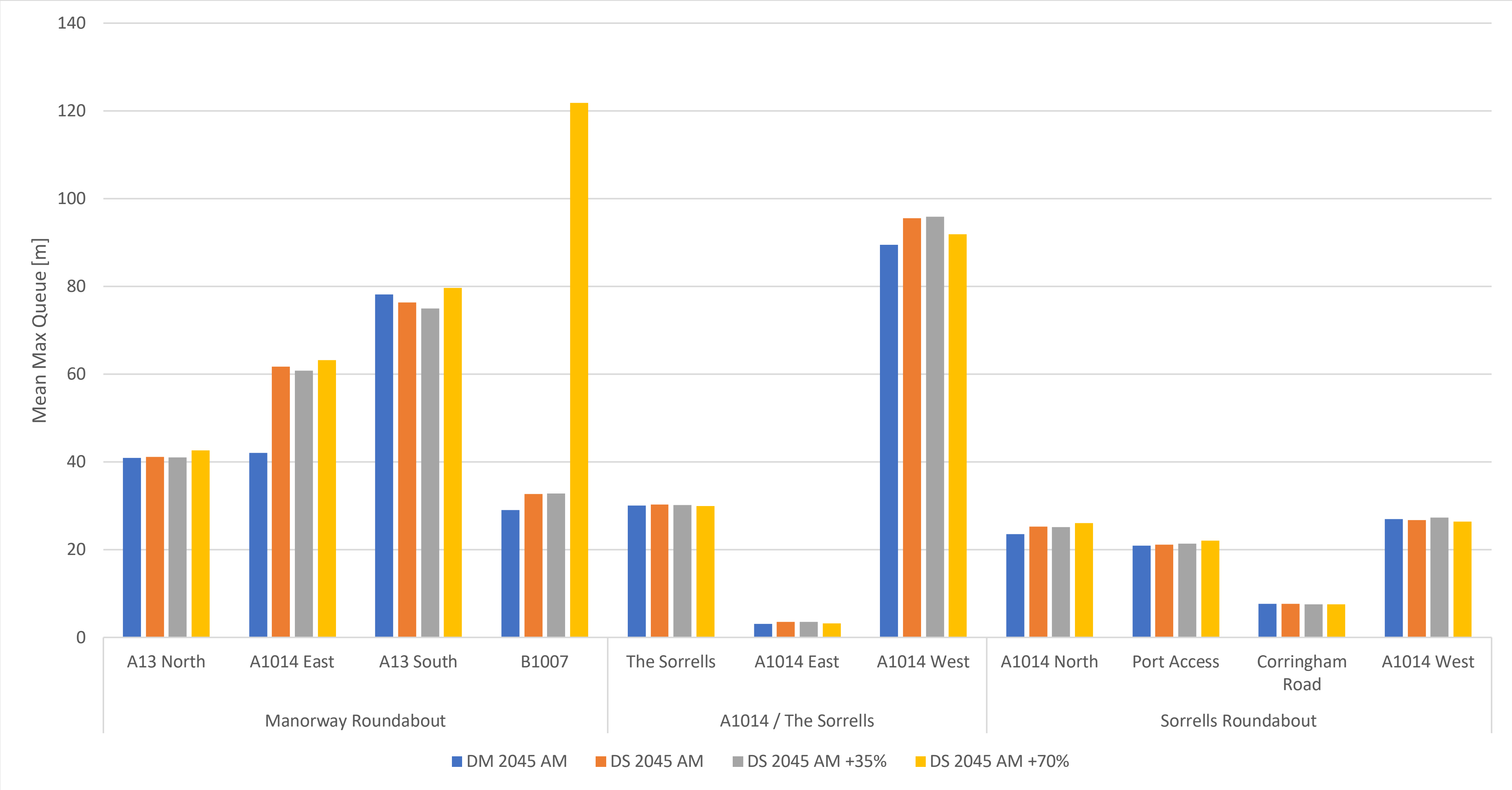


Plate B.2 Sensitivity Tests – Mean Max Queue PM Peak

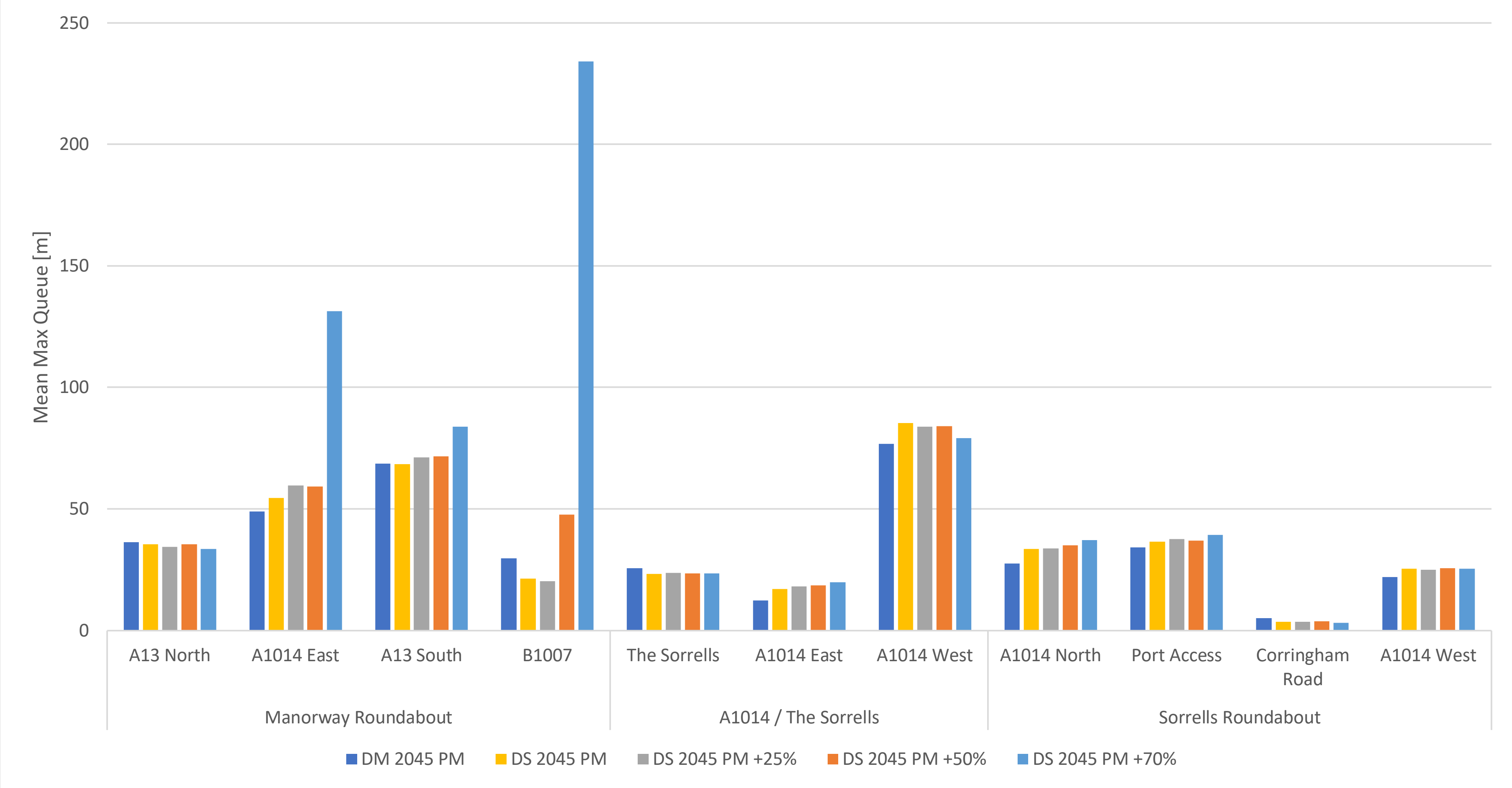


Table B.1 Sensitivity Tests Flows and Delays – 2045 AM

			DM 2045 AM		DS 2045 AM		DS 2045 AM +35%		DS 2045 AM +70%		Difference with DM: DS 2045 AM		Difference with DM: DS 2045 AM +35%		Difference with DM: DS 2045 AM +70%	
Junction	Approach	To	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)
Manorway Roundabout	A13 North (off-slip)	A13 North (on-slip)	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		A1014 East	386	21.2	301	23.6	301	23.6	302	24.1	-85	2.5	-85	2.4	-84	2.9
		A1013 South	89	32.0	106	31.8	106	31.5	107	32.0	17	-0.2	17	-0.5	18	-0.1
		B1007 West	16	50.1	8	48.1	8	48.5	8	42.0	-8	-2.0	-8	-1.6	-8	-8.1
	A1014 East	A1014 East	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		A1013 South	41	6.0	47	8.9	47	8.7	47	9.3	6	2.8	6	2.6	6	3.3
		A13 South (on-slip)	1136	6.1	1436	8.3	1436	8.3	1426	9.7	300	2.2	300	2.2	290	3.6
		B1007 West	112	12.8	139	15.2	139	15.1	139	21.9	27	2.4	27	2.3	27	9.1
		A13 North (on-slip)	397	13.4	233	13.3	232	13.4	352	50.1	-164	-0.1	-165	0.1	-45	36.8
	A1013 South	A1013 South	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		A13 South (on-slip)	0	0.0	86	9.0	85	8.9	86	10.3	86	9.0	85	8.9	86	10.3
		B1007 West	51	17.6	58	26.2	58	26.8	57	28.6	7	8.6	7	9.3	6	11.0
		A13 North (on-slip)	307	31.2	154	32.2	154	32.4	288	70.7	-153	1.0	-153	1.2	-19	39.5
		A1014 East	98	37.6	86	34.7	86	34.6	84	63.1	-12	-2.9	-12	-3.0	-14	25.5
	A13 South (off-slip)	A13 South (on-slip)	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		B1007 West	481	14.5	360	11.4	360	11.5	362	12.0	-121	-3.1	-121	-3.0	-119	-2.5
		A1014 East	1196	19.3	1381	20.2	1381	20.4	1369	24.8	185	0.9	185	1.1	173	5.5
		A1013 South	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	B1007 West	B1007 West	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		A13 North (on-slip)	29	5.8	23	4.2	23	4.4	22	28.7	-6	-1.6	-6	-1.4	-7	22.9
		A1014 East	126	12.1	76	10.8	76	11.0	60	28.2	-50	-1.2	-50	-1.0	-66	16.2
		A1013 South	48	43.8	53	41.3	53	41.6	39	64.8	5	-2.5	5	-2.3	-9	20.9

			DM 2045 AM		DS 2045 AM		DS 2045 AM +35%		DS 2045 AM +70%		Difference with DM: DS 2045 AM		Difference with DM: DS 2045 AM +35%		Difference with DM: DS 2045 AM +70%	
Junction	Approach	To	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)
		A13 South (on-slip)	352	41.7	464	39.1	463	39.3	359	79.7	112	-2.7	111	-2.5	7	37.9
A1014 / The Sorrells	The Sorrels	A1014 East	205	21.0	212	20.9	211	21.0	211	20.7	7	-0.1	6	0.0	6	-0.3
	A1014 East	A1014 West	950	3.0	983	3.0	983	3.0	1020	3.0	33	0.0	33	0.0	70	0.0
		The Sorrels	14	17.9	13	18.7	13	18.8	13	18.9	-1	0.8	-1	0.8	-1	0.9
	A1014 West	The Sorrels	60	13.0	60	11.1	59	11.1	59	10.6	0	-2.0	-1	-1.9	-1	-2.4
		A1014 East	1375	10.5	1488	9.5	1488	9.6	1471	9.3	113	-1.0	113	-0.9	96	-1.2
Sorrells Roundabout	A1014 North	A1014 North	16	20.1	44	21.1	44	21.5	45	21.5	28	1.0	28	1.4	29	1.4
		Port Access	86	9.5	107	9.7	107	9.8	108	10.0	21	0.2	21	0.3	22	0.5
		Corringham Rd	22	11.5	19	11.8	19	11.6	20	12.0	-3	0.3	-3	0.1	-2	0.5
		A1014 West	532	17.6	559	17.6	559	17.6	590	17.8	27	0.1	27	0.1	58	0.2
	Port Access	Port Access	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		Corringham Rd	4	8.1	3	9.4	3	8.7	3	10.0	-1	1.2	-1	0.6	-1	1.8
		A1014 West	282	10.0	284	10.8	284	10.8	290	11.1	2	0.7	2	0.8	8	1.1
		A1014 North	16	20.6	15	20.7	15	21.3	16	20.9	-1	0.1	-1	0.6	0	0.2
	Corringham Rd	Corringham Rd	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		A1014 West	9	8.9	9	10.4	9	10.2	9	9.6	0	1.6	0	1.3	0	0.7
		A1014 North	39	22.8	37	23.3	37	23.3	37	23.3	-2	0.5	-2	0.5	-2	0.5
		Port Access	21	33.1	20	33.4	20	33.4	20	33.4	-1	0.2	-1	0.3	-1	0.3
	A1014 West	A1014 West	141	34.6	145	34.6	144	34.3	145	34.4	4	0.0	3	-0.3	4	-0.2
		A1014 North	697	1.0	803	1.0	803	1.1	795	1.0	106	0.1	106	0.1	98	0.0
		Port Access	729	5.9	706	6.1	706	6.2	695	6.1	-23	0.2	-23	0.3	-34	0.2
		Corringham Rd	13	29.4	45	17.4	44	17.7	43	17.5	32	-12.0	31	-11.7	30	-11.9

Table B.2 Sensitivity Tests Flows and Delays – 2045 PM

													Difference with DM							
			DM 2045 PM		DS 2045 PM		DS 2045 PM +25%		DS 2045 PM +50%		DS 2045 PM +70%		DS 2045 PM		DS 2045 PM +25%		DS 2045 PM +50%		DS 2045 PM +70%	
Junction	Approach	To	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)
Manorway Roundabout	A13 North (off-slip)	A13 North (on-slip)	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		A1014 East	387	19.3	228	25.8	229	25.8	229	26.2	229	24.9	-159	6.6	-158	6.5	-158	7.0	-158	5.6
		A1013 South	108	32.6	98	33.1	98	32.2	98	32.8	99	34.0	-10	0.6	-10	-0.3	-10	0.3	-9	1.5
		B1007 West	13	50.8	8	49.5	8	44.6	9	47.7	8	86.9	-5	-1.3	-5	-6.2	-4	-3.0	-5	36.2
	A1014 East	A1014 East	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		A1013 South	100	5.7	109	6.5	109	6.8	109	6.9	96	15.5	9	0.8	9	1.1	9	1.2	-4	9.7
		A13 South (on-slip)	1300	5.7	1704	6.9	1704	7.3	1703	7.4	1497	20.0	404	1.2	404	1.6	403	1.7	197	14.4
		B1007 West	508	16.6	448	20.8	449	21.2	448	21.9	375	72.6	-60	4.2	-59	4.7	-60	5.4	-133	56.0
		A13 North (on-slip)	558	15.4	93	17.5	206	18.7	312	35.3	344	187.8	-465	2.1	-352	3.3	-246	19.9	-214	172.4
	A1013 South	A1013 South	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		A13 South (on-slip)	0	0.0	95	11.4	95	12.1	94	13.0	94	18.4	95	11.4	95	12.1	94	13.0	94	18.4
		B1007 West	91	27.1	111	32.3	112	32.4	112	33.0	109	50.5	20	5.1	21	5.2	21	5.9	18	23.4
		A13 North (on-slip)	119	32.0	41	29.7	40	30.0	64	46.5	75	208.8	-78	-2.3	-79	-2.0	-55	14.5	-44	176.8
		A1014 East	39	34.7	80	30.8	80	31.1	80	38.8	69	167.7	41	-3.9	41	-3.6	41	4.1	30	132.9
	A13 South (off-slip)	A13 South (on-slip)	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		B1007 West	438	14.4	416	11.8	418	11.8	418	12.0	416	13.4	-22	-2.6	-20	-2.6	-20	-2.4	-22	-1.0
		A1014 East	1123	19.2	1258	16.6	1263	16.7	1260	19.1	1252	31.7	135	-2.7	140	-2.6	137	-0.1	129	12.5
		A1013 South	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	B1007 West	B1007 West	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

			DM 2045 PM		DS 2045 PM		DS 2045 PM +25%		DS 2045 PM +50%		DS 2045 PM +70%		Difference with DM: DS 2045 PM		Difference with DM: DS 2045 PM +25%		Difference with DM: DS 2045 PM +50%		Difference with DM: DS 2045 PM +70%	
Junction	Approach	To	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)	Flow (veh)	Delay (s)
		A13 North (on-slip)	28	6.1	17	3.5	10	3.8	15	25.7	10	111.8	-11	-2.6	-18	-2.3	-13	19.6	-18	105.7
		A1014 East	237	14.2	312	7.9	313	8.3	288	20.0	152	66.3	75	-6.3	76	-5.8	51	5.8	-85	52.1
		A1013 South	39	45.2	75	31.1	75	32.6	68	44.7	34	80.7	36	-14.1	36	-12.5	29	-0.4	-5	35.5
		A13 South (on-slip)	237	43.3	229	30.6	229	32.2	209	42.7	108	97.3	-8	-12.8	-8	-11.1	-28	-0.7	-129	53.9
A1014 / The Sorrells	The Sorrels	A1014 East	171	20.0	171	19.1	172	19.1	173	19.3	174	19.0	0	-0.9	1	-0.9	2	-0.8	3	-1.0
	A1014 East	A1014 West	1810	4.6	1654	5.1	1734	5.2	1814	5.4	1891	5.8	-156	0.4	-76	0.6	4	0.7	81	1.1
		The Sorrels	63	18.9	97	18.4	97	18.5	96	17.8	97	18.5	34	-0.5	34	-0.4	33	-1.1	34	-0.5
	A1014 West	The Sorrels	190	14.5	153	16.7	153	16.2	149	16.0	143	14.7	-37	2.2	-37	1.7	-41	1.5	-47	0.2
		A1014 East	841	11.6	1016	13.9	1017	13.8	1013	13.6	968	12.4	175	2.3	176	2.2	172	2.1	127	0.8
Sorrells Roundabout	A1014 North	A1014 North	33	25.6	158	27.6	159	28.3	160	30.2	161	32.1	125	2.0	126	2.7	127	4.6	128	6.5
		Port Access	15	8.0	14	9.0	15	9.1	15	9.4	15	9.2	-1	1.0	0	1.1	0	1.3	0	1.2
		Corringham Rd	31	12.4	28	11.6	28	12.2	28	12.0	28	12.2	-3	-0.8	-3	-0.2	-3	-0.4	-3	-0.2
		A1014 West	854	20.2	842	19.9	888	20.2	933	20.7	978	21.6	-12	-0.3	34	0.0	79	0.6	124	1.5
	Port Access	Port Access	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		Corringham Rd	28	8.6	28	8.5	27	9.0	28	8.9	27	9.0	0	-0.1	-1	0.4	0	0.3	-1	0.4
		A1014 West	858	11.7	768	12.8	802	13.2	835	13.7	869	14.6	-90	1.1	-56	1.5	-23	2.0	11	2.9
		A1014 North	41	17.9	128	29.3	128	30.0	128	30.3	128	30.6	87	11.4	87	12.1	87	12.3	87	12.7
	Corringham Rd	Corringham Rd	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		A1014 West	13	8.6	9	9.4	8	9.7	8	8.7	8	9.4	-4	0.7	-5	1.1	-5	0.0	-5	0.8
		A1014 North	16	24.6	9	20.9	10	22.4	10	21.3	10	20.1	-7	-3.7	-6	-2.2	-6	-3.3	-6	-4.5

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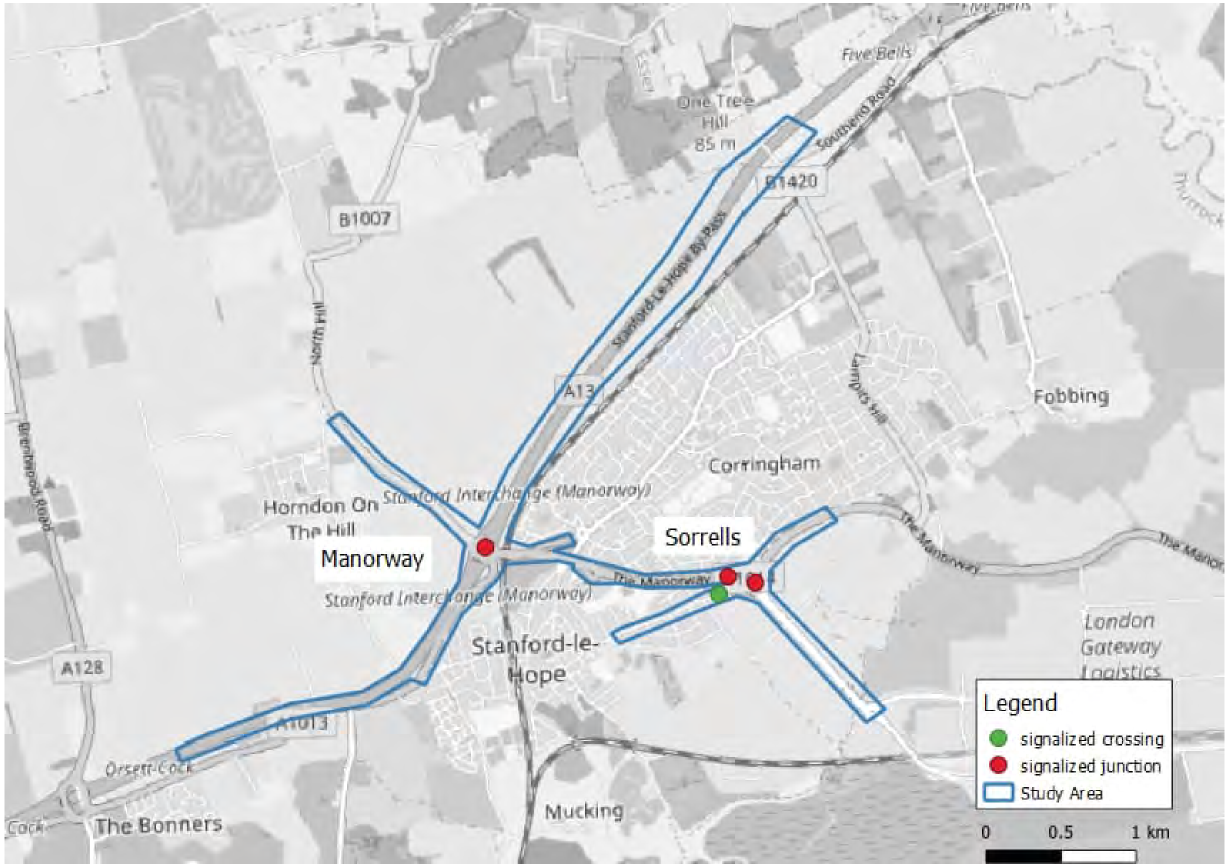
Manorway VISSIM Model

21 September 2022

VISSIM Model Extent



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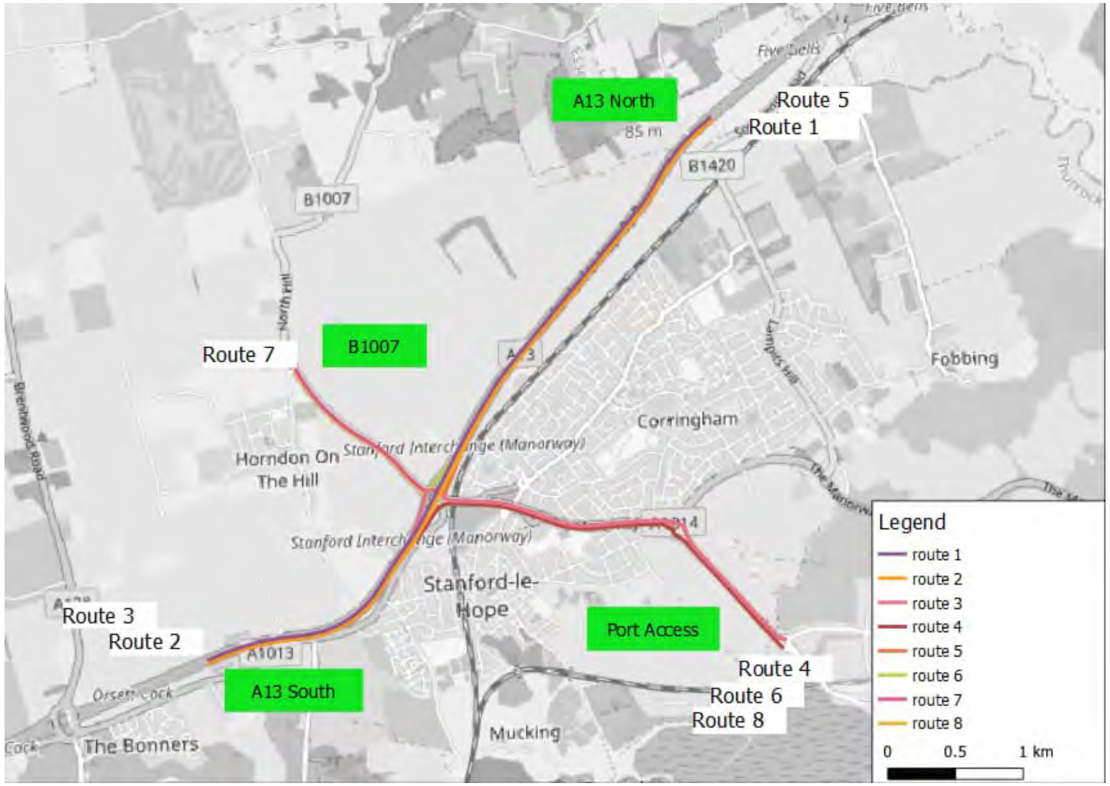
VISSIM Journey Time Results



Route	Journey Times [s]					
	Do-Minimum		Do-Something		Difference (DS-DM)	
	2030 AM	2045 AM	2030 AM	2045 AM	2030 AM	2045 AM
1. A13 South to A13 North	103	105	104	106	2	1
2. A13 North to A13 South	111	114	126	135	15	21
3. A13 South to Port Access	238	240	244	242	7	2
4. Port Access to A13 South	225	221	231	239	5	18
5. A13 North to Port Access	205	206	207	213	2	7
6. Port Access to A13 North	258	265	258	264	-1	-2
7. B1007 to Port Access	205	208	209	207	4	0
8. Port Access to B1007	207	202	204	207	-2	5

Route	Journey Times [s]					
	Do-Minimum		Do-Something		Difference (DS-DM)	
	2030 PM	2045 PM	2030 PM	2045 PM	2030 PM	2045 PM
1. A13 South to A13 North	105	105	106	110	2	5
2. A13 North to A13 South	104	109	116	140	13	31
3. A13 South to Port Access	240	242	238	246	-2	3
4. Port Access to A13 South	217	224	232	246	15	22
5. A13 North to Port Access	204	206	207	221	3	15
6. Port Access to A13 North	282	290	276	281	-6	-9
7. B1007 to Port Access	206	211	203	203	-4	-8
8. Port Access to B1007	210	213	216	220	6	7

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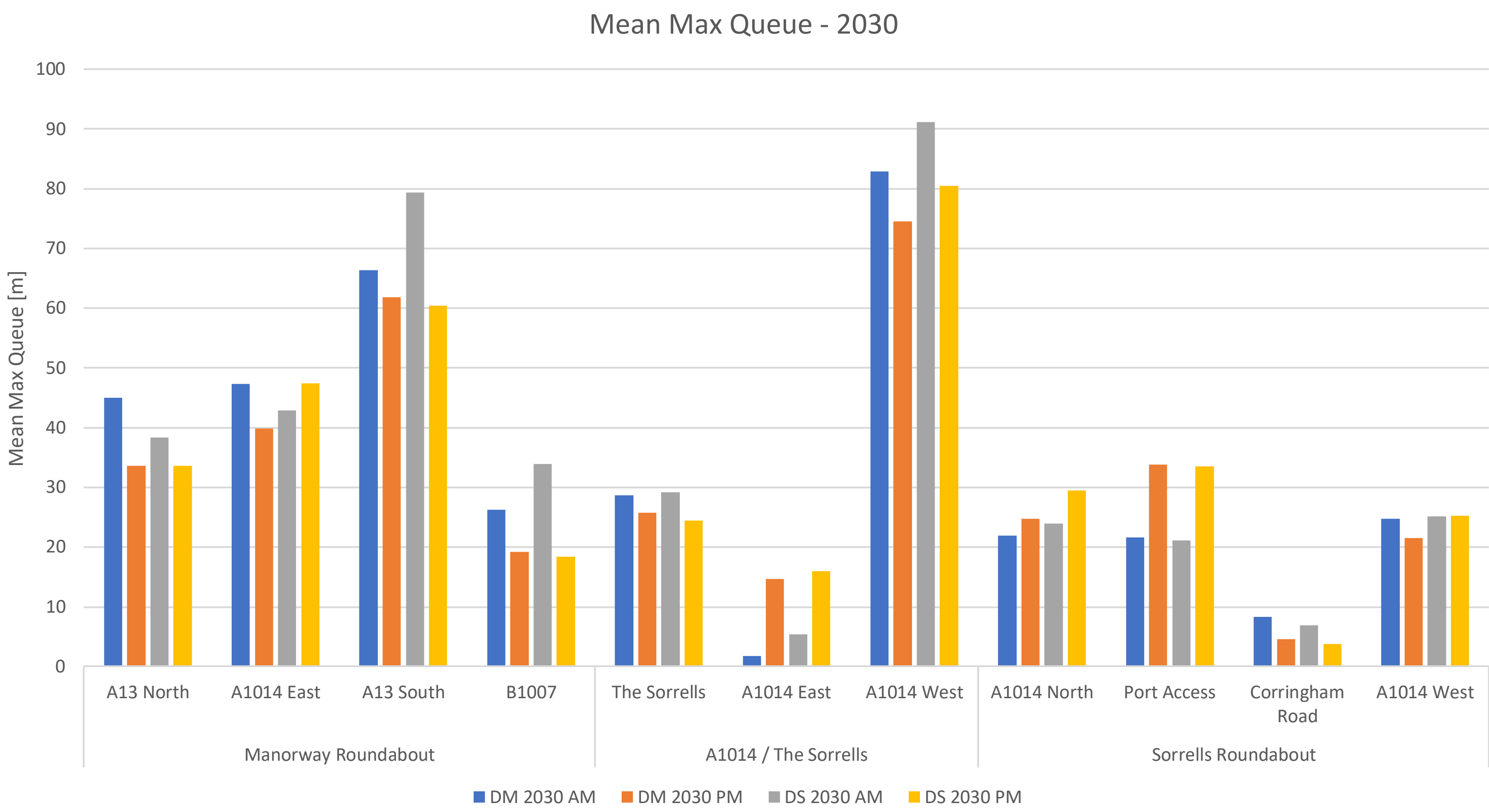
VISSIM Queue Results 2030



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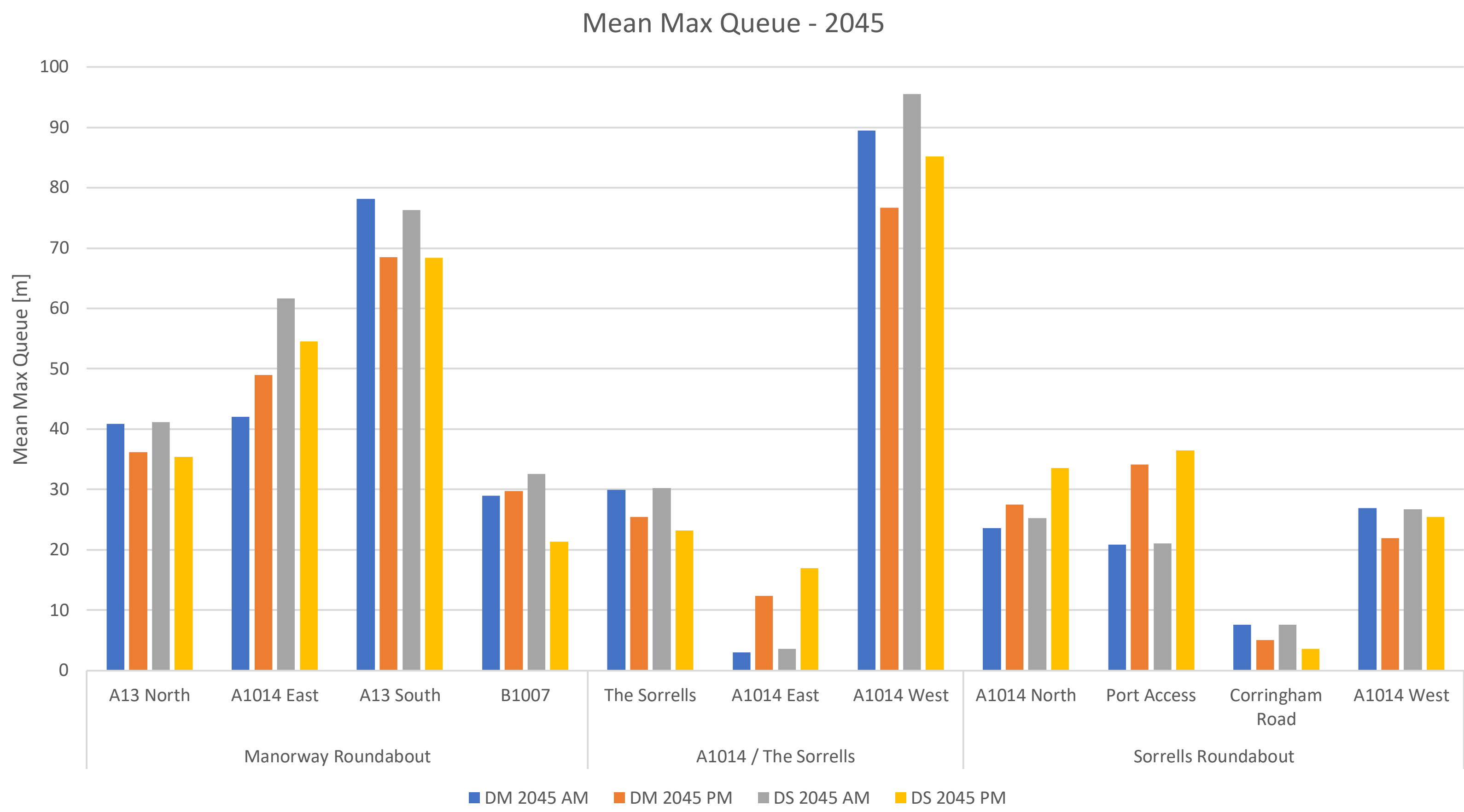
VISSIM Queue Results 2045



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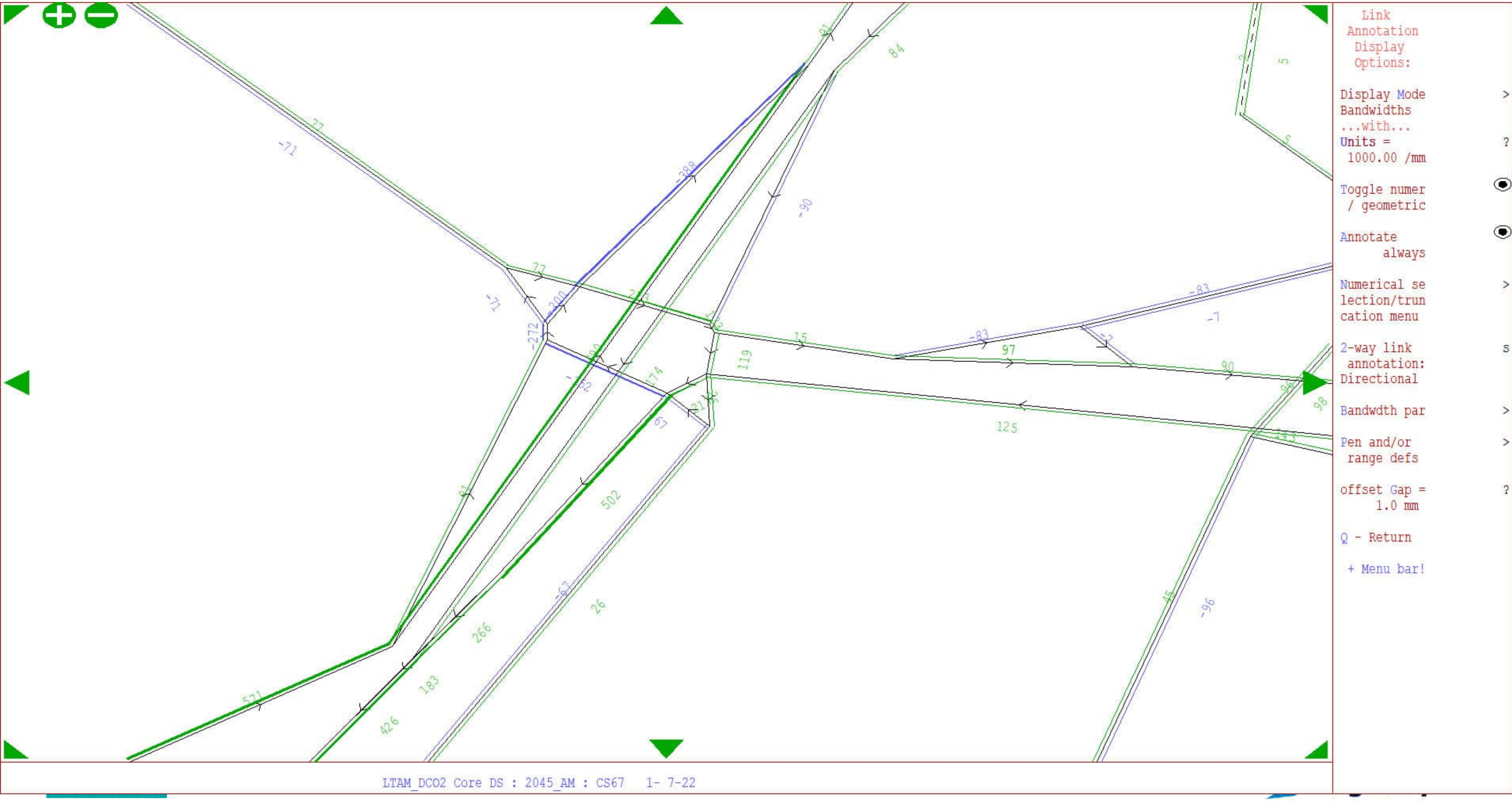
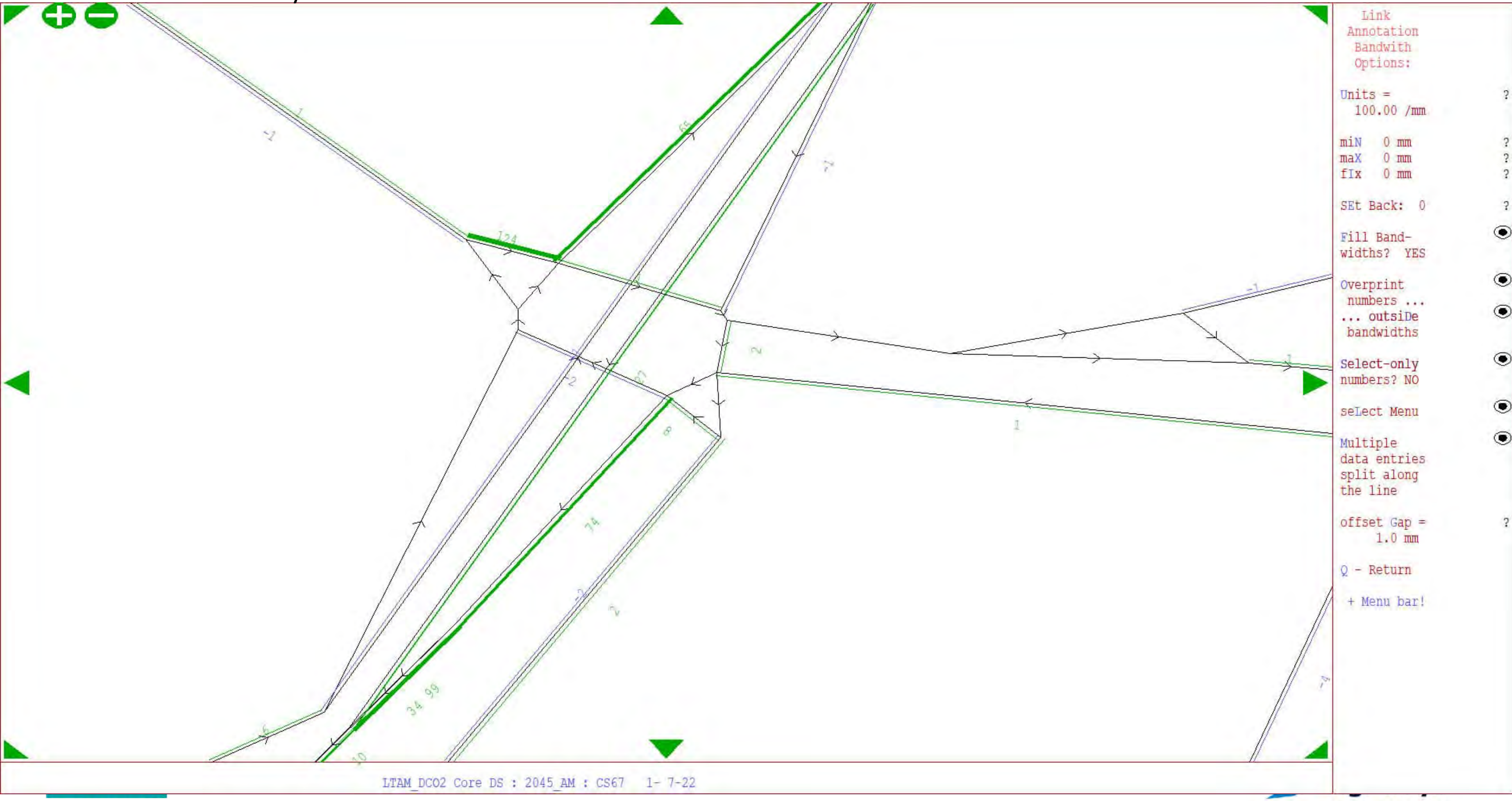
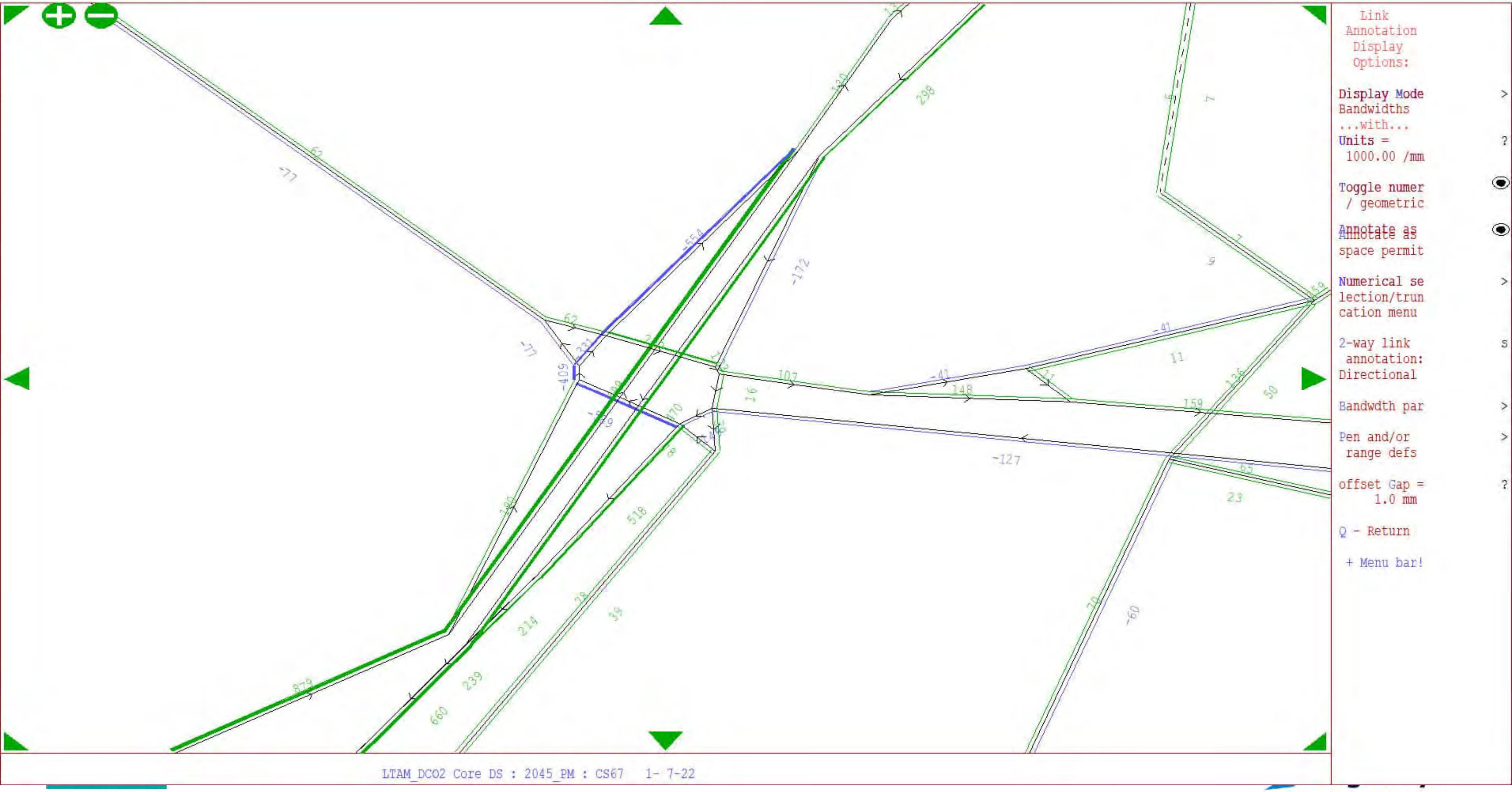
2045 AM DS-DM Flow Difference Plot



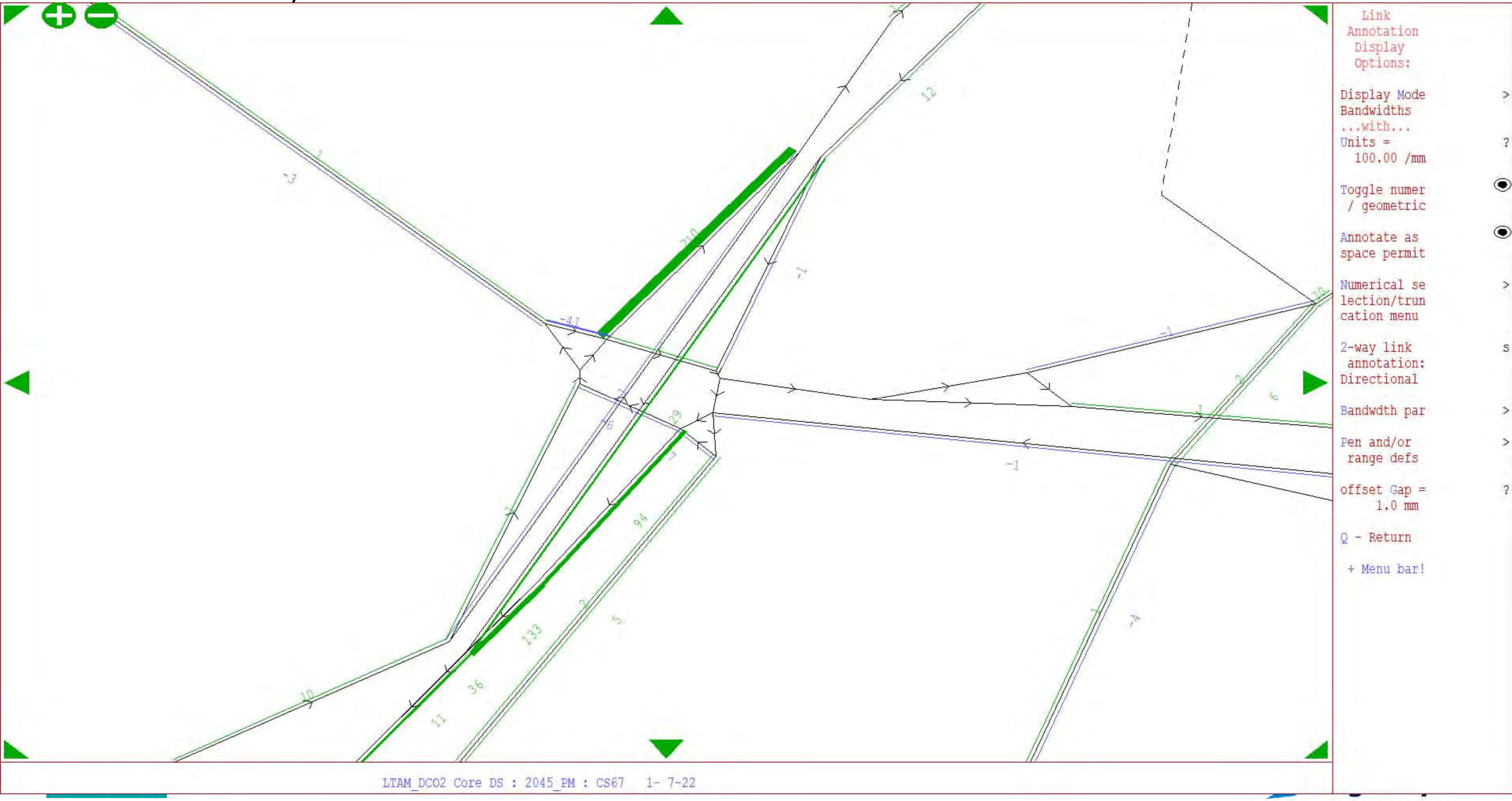
2045 AM DS-DM Delay Difference Plot



2045 PM DS-DM Flow Difference Plot

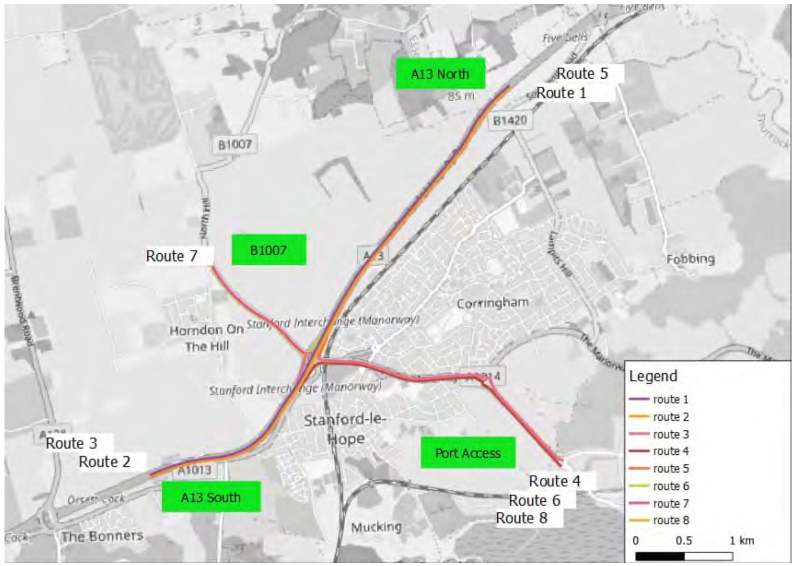


2045 PM DS-DM Delay Difference Plot



VISSIM Sensitivity Tests – Journey Times

- DS 2045 AM +35% (approx. +130 PCUs)
- DS 2045 AM +70% (approx. +275 PCUs)
- DS 2045 PM +25% (approx. +150 PCUs)
- DS 2045 PM +50% (approx. +250 PCUs)
- DS 2045 PM +70% (approx. +400 PCUs)



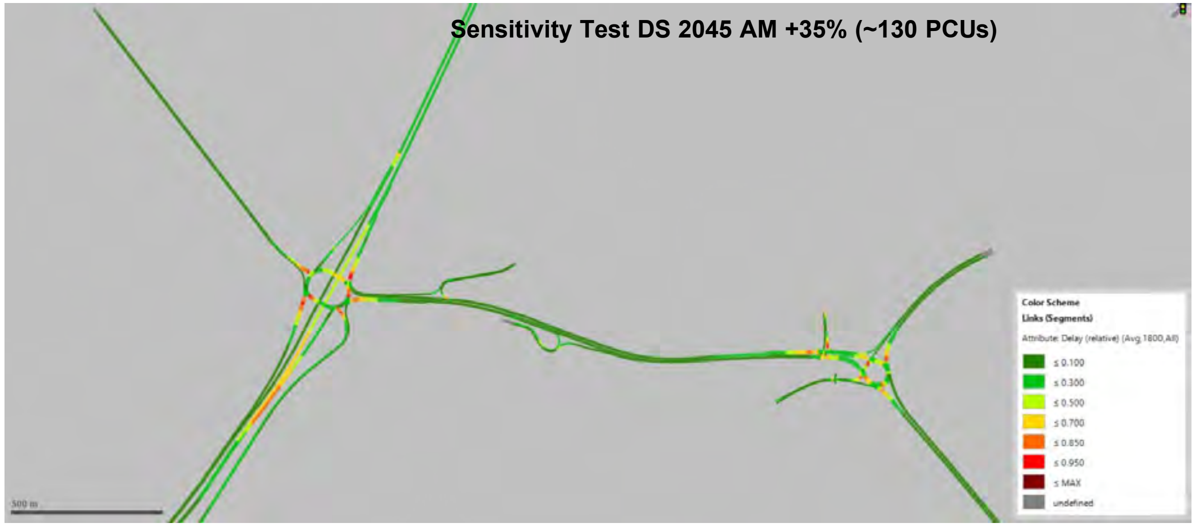
Route	Journey Times [s] – Core Scenarios: DM 2045 AM	Core Scenarios: DS 2045 AM	Sensitivity Test: DS 2045 AM +35%	Sensitivity Test: DS 2045 AM +70%	Difference: DS 2045 AM	Difference: DS 2045 AM +35%	Difference: DS 2045 AM +70%
1. A13 South to A13 North	105	106	106	108	1	1	3
2. A13 North to A13 South	114	135	135	131	21	21	17
3. A13 South to Port Access	240	242	243	246	2	2	6
4. Port Access to A13 South	221	239	239	240	18	18	19
5. A13 North to Port Access	206	213	213	211	7	7	6
6. Port Access to A13 North	265	264	262	386	-2	-4	121
7. B1007 to Port Access	208	207	208	259	0	0	52
8. Port Access to B1007	202	207	207	215	5	5	13

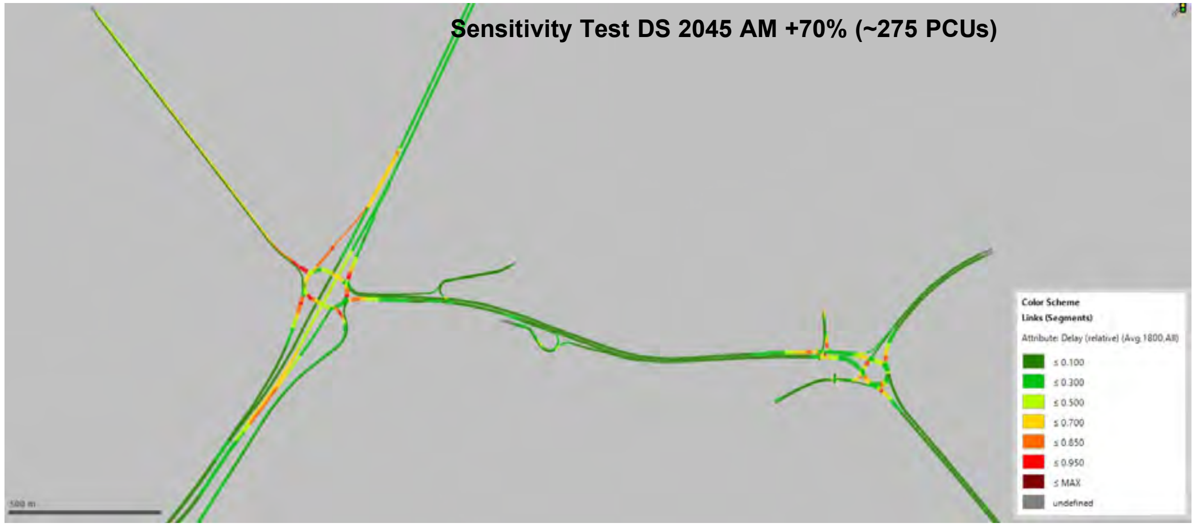
Route	Journey Times [s] – Core Scenarios: DM 2045 PM	Core Scenarios: DS 2045 PM	Sensitivity Test: DS 2045 PM +25%	Sensitivity Test: DS 2045 PM +50%	Sensitivity Test: DS 2045 PM +70%	Difference: DS 2045 PM	Difference: DS 2045 PM +25%	Difference: DS 2045 PM +50%	Difference: DS 2045 PM +70%
1. A13 South to A13 North	105	110	109	111	112	5	4	6	7
2. A13 North to A13 South	109	140	133	133	131	31	24	25	22
3. A13 South to Port Access	242	246	244	246	257	3	2	4	15
4. Port Access to A13 South	224	246	247	248	328	22	24	25	104
5. A13 North to Port Access	206	221	218	219	215	15	12	13	9
6. Port Access to A13 North	290	281	289	423	726	-9	-1	133	436
7. B1007 to Port Access	211	203	204	225	304	-8	-8	14	93
8. Port Access to B1007	213	220	221	223	332	7	8	10	119

Lower Thames Crossing

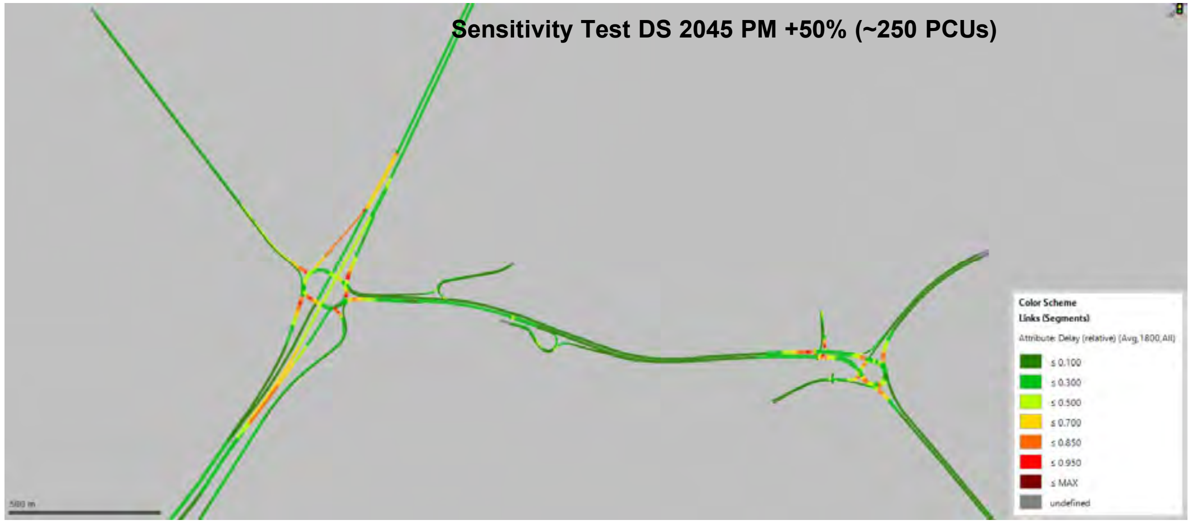
national highways

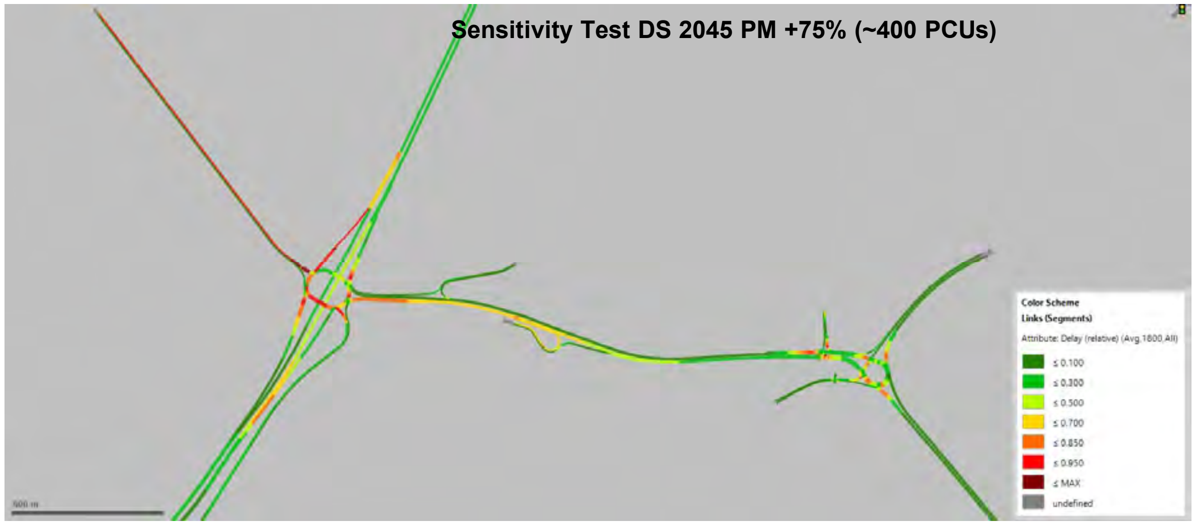
VISSIM Sensitivity Test Heatmaps – AM Peak





VISSIM Sensitivity Test Heatmaps – PM Peak





Appendix G

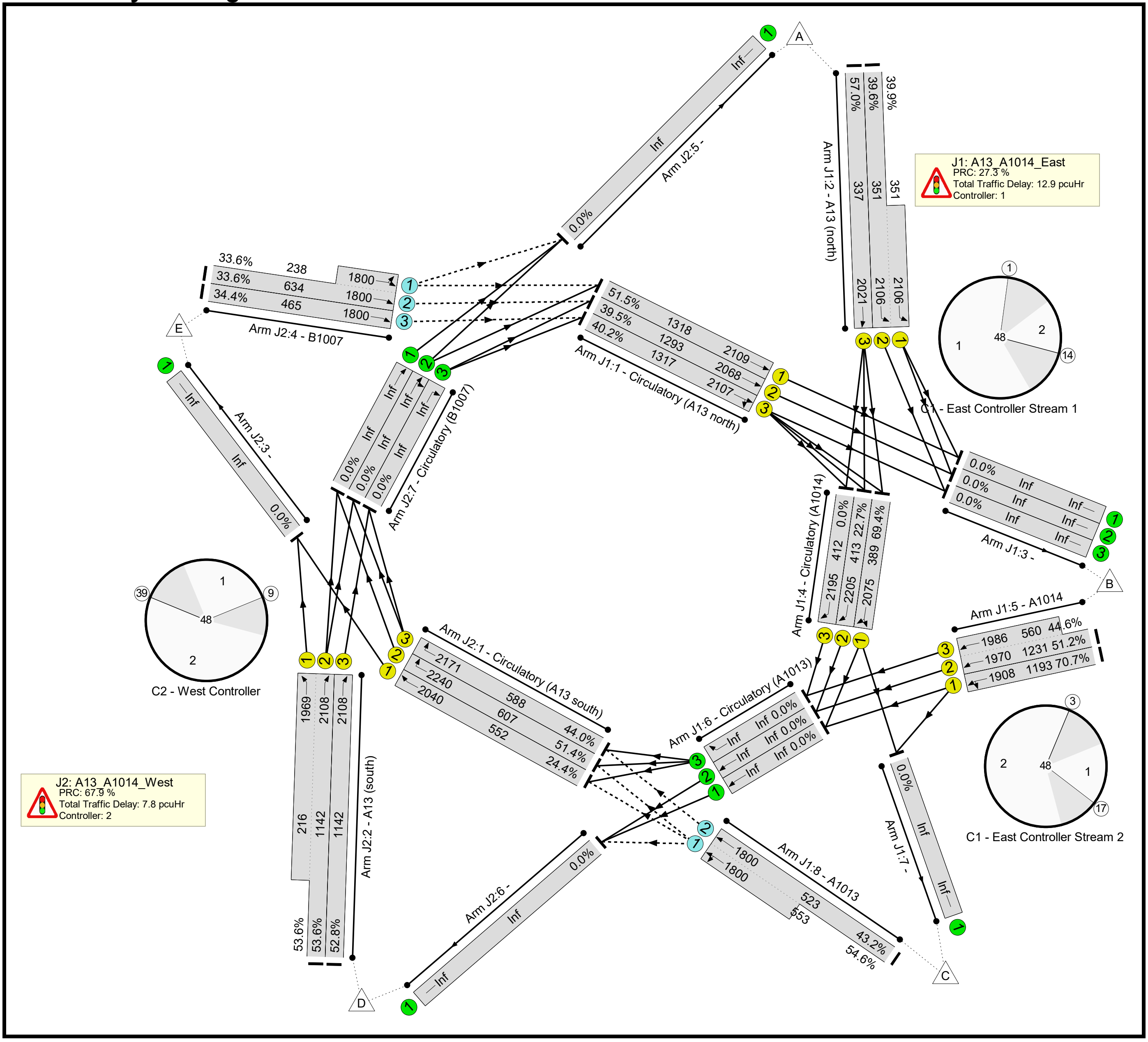
Basic Results Summary
Basic Results Summary

User and Project Details

Project:	**London GAteway**
Title:	**A13/A1014**
Location:	
Additional detail:	
File name:	Manorway v3.lsg3x
Author:	RM
Company:	DTA
Address:	Henley in Arden

Scenario 1: 'AM Base + Com (Demand)' (FG1: 'AM Base + Com (Demand)', 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: A13/A1014	-	-	-		-	-	-	-	-	-	**70.7%**	**1802**	**0**	**0**	**20.7**	-	-
J1: A13_A1014_East	-	-	-		-	-	-	-	-	-	**70.7%**	**1056**	**0**	**0**	**12.9**	-	-
1/1	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	679	2109	1318	51.5%	-	-	-	0.7	3.7	1.2
1/2	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	511	2068	1293	39.5%	-	-	-	0.7	4.7	2.1
1/3	Circulatory (A13 north) Ahead Right	U	C1:A		1	29	-	529	2107	1317	40.2%	-	-	-	0.6	4.3	1.8
2/2+2/1	A13 (north) Left	U	C1:B		1	7	-	279	2106:2106	351+351	39.6 : 39.9%	-	-	-	1.7 (0.9+0.9)	22.1 (22.1:22.1)	2.0
2/3	A13 (north) Ahead	U	C1:B		1	7	-	192	2021	337	57.0%	-	-	-	1.6	30.7	3.0
4/1	Circulatory (A1014) Right Ahead	U	C1:C		1	8	-	270	2075	389	69.4%	-	-	-	1.8	23.9	2.4
4/2	Circulatory (A1014) Right	U	C1:C		1	8	-	94	2205	413	22.7%	-	-	-	0.7	27.1	1.4
4/3	Circulatory (A1014) Right	U	C1:C		1	8	-	0	2195	412	0.0%	-	-	-	0.0	0.0	0.0
5/1	A1014 Ahead Left	U	C1:D		1	29	-	843	1908	1193	70.7%	-	-	-	2.6	11.2	8.7
5/2+5/3	A1014 Ahead	U	C1:D		1	29	-	881	1970:1986	1231+560	51.2 : 44.6%	-	-	-	1.6 (1.2+0.4)	6.6 (6.9:5.9)	5.0
8/2+8/1	A1013 Ahead Left	O	-		-	-	-	528	1800:1800	523+553	43.2 : 54.6%	1056	0	0	0.9 (0.4+0.5)	5.8 (5.6:6.0)	2.4
J2: A13_A1014_West	-	-	-		-	-	-	-	-	-	**53.6%**	**746**	**0**	**0**	**7.8**	-	-
1/1	Circulatory (A13 south) Ahead	U	C2:A		1	12	-	135	2040	552	24.4%	-	-	-	0.6	17.0	1.2

Basic Results Summary

1/2	Circulatory (A13 south) Right	U	C2:A		1	12	-	312	2240	607	51.4%	-	-	-	1.5	17.8	3.8
1/3	Circulatory (A13 south) Right	U	C2:A		1	12	-	259	2171	588	44.0%	-	-	-	1.3	18.0	2.6
2/2+2/1	A13 (south) Ahead Ahead2	U	C2:B		1	25	-	728	2108:1969	1142+216	53.6 : 53.6%	-	-	-	2.0 (1.7+0.3)	9.7 (10.0:8.2)	5.7
2/3	A13 (south) Ahead	U	C2:B		1	25	-	603	2108	1142	52.8%	-	-	-	1.7	10.4	5.6
4/2+4/1	B1007 Left Ahead	O	-		-	-	-	293	1800:1800	634+238	33.6 : 33.6%	586	0	0	0.3 (0.2+0.1)	3.3 (3.4:3.3)	0.7
4/3	B1007 Ahead	O	-		-	-	-	160	1800	465	34.4%	160	0	0	0.3	7.5	0.8

C1 - East Controller Stream: 1 PRC for Signalled Lanes (%): 57.9 Total Delay for Signalled Lanes (pcuHr): 5.34 Cycle Time (s): 48
C1 - East Controller Stream: 2 PRC for Signalled Lanes (%): 27.3 Total Delay for Signalled Lanes (pcuHr): 6.74 Cycle Time (s): 48
C2 - West Controller PRC for Signalled Lanes (%): 67.9 Total Delay for Signalled Lanes (pcuHr): 7.17 Cycle Time (s): 48
PRC Over All Lanes (%): 27.3 Total Delay Over All Lanes(pcuHr): 20.70

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E
A	0.0	27.1	59.6	0.0	0.0
B	42.9	0.0	16.2	18.9	0.0
C	39.4	55.8	0.0	11.0	32.9
D	0.0	28.2	68.2	0.0	13.2
E	8.3	19.4	64.9	60.4	0.0

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E
A	0.0	22.1	49.6	0.0	0.0
B	22.9	0.0	11.2	8.9	0.0
C	24.4	35.8	0.0	6.0	22.9
D	0.0	13.2	48.2	0.0	8.2
E	3.3	9.4	49.9	40.4	0.0

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 1: AM Base + Com (Demand)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	13.25
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	60.45
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	8.25
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	42.98
12	D	J2:2/3	B	J1:3/2	28.16
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	19.40
17	D	J2:2/3	B	J1:3/3	28.14
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	21.16
22	A	J1:2/2	B	J1:3/2	27.12
23	C	J1:8/2	A	J2:5/1	40.22
24	B	J1:5/2	A	J2:5/1	42.07
27	C	J1:8/2	B	J1:3/2	55.91
28	A	J1:2/2	B	J1:3/1	27.12
30	A	J1:2/2	B	J1:3/3	27.11
31	D	J2:2/2	B	J1:3/1	28.22
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	19.59
34	B	J1:5/2	D	J2:6/1	16.95
35	D	J2:2/3	C	J1:7/1	68.21
36	E	J2:4/3	C	J1:7/1	64.94
37	A	J1:2/3	C	J1:7/1	59.57
38	B	J1:5/1	C	J1:7/1	16.16
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	38.85
43	C	J1:8/2	C	J1:7/1	-
44	C	J1:8/2	B	J1:3/3	55.71

Basic Results Summary

45	C	J1:8/2	B	J1:3/1	55.66
46	C	J1:8/2	E	J2:3/1	32.94
47	C	J1:8/2	D	J2:6/1	10.96

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 1: AM Base + Com (Demand)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	8.25
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	40.45
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	3.25
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	22.98
12	D	J2:2/3	B	J1:3/2	13.16
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	9.40
17	D	J2:2/3	B	J1:3/3	13.14
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	11.16
22	A	J1:2/2	B	J1:3/2	22.12
23	C	J1:8/2	A	J2:5/1	25.22
24	B	J1:5/2	A	J2:5/1	22.07
27	C	J1:8/2	B	J1:3/2	35.91
28	A	J1:2/2	B	J1:3/1	22.12
30	A	J1:2/2	B	J1:3/3	22.11
31	D	J2:2/2	B	J1:3/1	13.22
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	9.59
34	B	J1:5/2	D	J2:6/1	6.95
35	D	J2:2/3	C	J1:7/1	48.21
36	E	J2:4/3	C	J1:7/1	49.94
37	A	J1:2/3	C	J1:7/1	49.57
38	B	J1:5/1	C	J1:7/1	11.16
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	23.85
43	C	J1:8/2	C	J1:7/1	-
44	C	J1:8/2	B	J1:3/3	35.71

Basic Results Summary

45	C	J1:8/2	B	J1:3/1	35.66
46	C	J1:8/2	E	J2:3/1	22.94
47	C	J1:8/2	D	J2:6/1	5.96

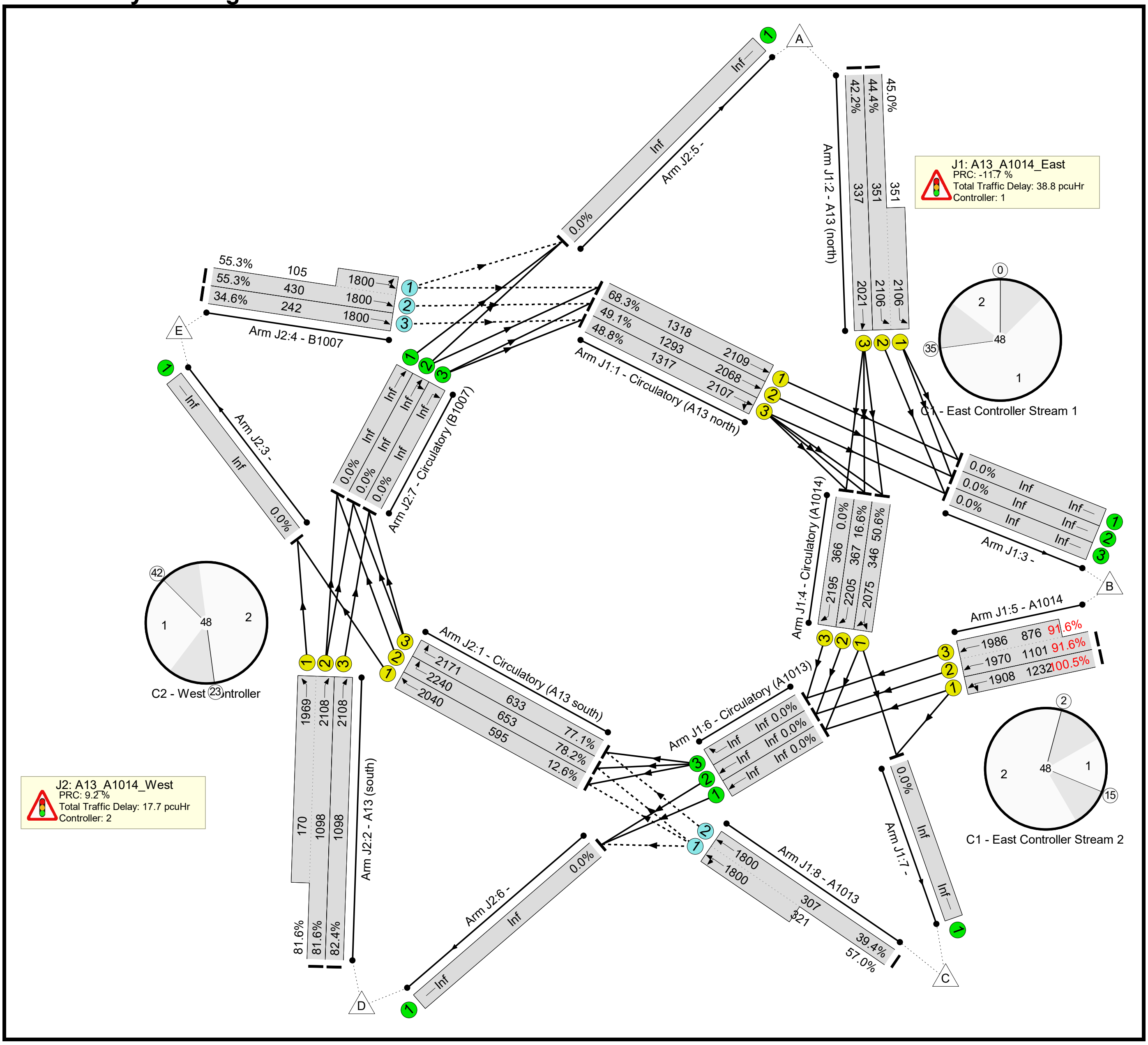
Traffic Flows, Actual

Actual Flow :

		Destination					
		A	B	C	D	E	Tot.
Origin	A	0	279	192	0	0	471
	B	250	0	283	1191	0	1724
	C	243	78	0	72	135	528
	D	0	1203	12	0	116	1331
	E	27	266	66	94	0	453
	Tot.	520	1826	553	1357	251	4507

Scenario 2: 'I/P Base + Com (Demand)' (FG2: 'I/P Base + Com (Demand)', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

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: A13/A1014	-	-	-		-	-	-	-	-	-	**100.5%**	**1284**	**0**	**0**	**56.5**	-	-
J1: A13_A1014_East	-	-	-		-	-	-	-	-	-	**100.5%**	**608**	**0**	**0**	**38.8**	-	-
1/1	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	900	2109	1318	68.3%	-	-	-	1.1	4.5	1.3
1/2	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	635	2068	1293	49.1%	-	-	-	0.7	4.0	1.9
1/3	Circulatory (A13 north) Ahead Right	U	C1:A		1	29	-	643	2107	1317	48.8%	-	-	-	0.7	3.7	1.4
2/2+2/1	A13 (north) Left	U	C1:B		1	7	-	314	2106:2106	351+351	44.4 : 45.0%	-	-	-	2.0 (1.0+1.0)	22.7 (22.7:22.7)	2.3
2/3	A13 (north) Ahead	U	C1:B		1	7	-	142	2021	337	42.2%	-	-	-	1.1	27.1	2.1
4/1	Circulatory (A1014) Right Ahead	U	C1:C		1	7	-	175	2075	346	50.6%	-	-	-	1.0	21.5	2.7
4/2	Circulatory (A1014) Right	U	C1:C		1	7	-	61	2205	367	16.6%	-	-	-	0.3	17.3	0.5
4/3	Circulatory (A1014) Right	U	C1:C		1	7	-	0	2195	366	0.0%	-	-	-	0.0	0.0	0.0
5/1	A1014 Ahead Left	U	C1:D		1	30	-	1239	1908	1232	100.5%	-	-	-	22.5	65.4	36.0
5/2+5/3	A1014 Ahead	U	C1:D		1	30	-	1810	1970:1986	1101+876	91.6 : 91.6%	-	-	-	8.0 (4.6+3.4)	15.8 (16.3:15.2)	14.6
8/2+8/1	A1013 Ahead Left	O	-		-	-	-	304	1800:1800	307+321	39.4 : 57.0%	608	0	0	1.5 (0.6+0.9)	17.5 (17.1:17.7)	2.4
J2: A13_A1014_West	-	-	-		-	-	-	-	-	-	**82.4%**	**676**	**0**	**0**	**17.7**	-	-
1/1	Circulatory (A13 south) Ahead	U	C2:A		1	13	-	75	2040	595	12.6%	-	-	-	0.3	12.9	1.0

Basic Results Summary

1/2	Circulatory (A13 south) Right	U	C2:A		1	13	-	511	2240	653	78.2%	-	-	-	3.5	24.5	7.0
1/3	Circulatory (A13 south) Right	U	C2:A		1	13	-	488	2171	633	77.1%	-	-	-	3.3	24.5	7.1
2/2+2/1	A13 (south) Ahead Ahead2	U	C2:B		1	24	-	1035	2108:1969	1098+170	81.6 : 81.6%	-	-	-	4.8 (4.3+0.5)	16.7 (17.2:13.5)	12.1
2/3	A13 (south) Ahead	U	C2:B		1	24	-	905	2108	1098	82.4%	-	-	-	4.7	18.8	12.3
4/2+4/1	B1007 Left Ahead	O	-		-	-	-	296	1800:1800	430+105	55.3 : 55.3%	592	0	0	0.8 (0.6+0.1)	9.2 (9.4:8.5)	1.7
4/3	B1007 Ahead	O	-		-	-	-	84	1800	242	34.6%	84	0	0	0.4	16.7	0.8

C1 - East Controller Stream: 1 PRC for Signalled Lanes (%): 31.8 Total Delay for Signalled Lanes (pcuHr): 5.55 Cycle Time (s): 48
C1 - East Controller Stream: 2 PRC for Signalled Lanes (%): -11.7 Total Delay for Signalled Lanes (pcuHr): 31.79 Cycle Time (s): 48
C2 - West Controller PRC for Signalled Lanes (%): 9.2 Total Delay for Signalled Lanes (pcuHr): 16.58 Cycle Time (s): 48
PRC Over All Lanes (%): -11.7 Total Delay Over All Lanes(pcuHr): 56.54

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E
A	0.0	27.7	57.4	0.0	0.0
B	59.4	0.0	70.4	50.8	0.0
C	58.1	76.0	0.0	22.7	40.6
D	0.0	36.7	79.1	0.0	18.5
E	13.5	24.3	59.4	59.7	0.0

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E
A	0.0	22.7	47.4	0.0	0.0
B	39.4	0.0	65.4	40.8	0.0
C	43.1	56.0	0.0	17.7	30.6
D	0.0	21.7	59.1	0.0	13.5
E	8.5	14.3	44.4	39.7	0.0

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 2: I/P Base + Com (Demand)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	18.53
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	59.72
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	13.55
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	59.49
12	D	J2:2/3	B	J1:3/2	36.72
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	24.34
17	D	J2:2/3	B	J1:3/3	36.65
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	75.36
22	A	J1:2/2	B	J1:3/2	27.67
23	C	J1:8/2	A	J2:5/1	58.16
24	B	J1:5/2	A	J2:5/1	59.29
27	C	J1:8/2	B	J1:3/2	76.16
28	A	J1:2/2	B	J1:3/1	27.67
30	A	J1:2/2	B	J1:3/3	27.65
31	D	J2:2/2	B	J1:3/1	36.65
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	25.37
34	B	J1:5/2	D	J2:6/1	26.32
35	D	J2:2/3	C	J1:7/1	79.09
36	E	J2:4/3	C	J1:7/1	59.39
37	A	J1:2/3	C	J1:7/1	57.41
38	B	J1:5/1	C	J1:7/1	70.36
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	57.98
43	C	J1:8/2	C	J1:7/1	-
44	C	J1:8/2	B	J1:3/3	75.80

Basic Results Summary

45	C	J1:8/2	B	J1:3/1	77.27
46	C	J1:8/2	E	J2:3/1	40.61
47	C	J1:8/2	D	J2:6/1	22.70

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 2: I/P Base + Com (Demand)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	13.53
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	39.72
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	8.55
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	39.49
12	D	J2:2/3	B	J1:3/2	21.72
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	14.34
17	D	J2:2/3	B	J1:3/3	21.65
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	65.36
22	A	J1:2/2	B	J1:3/2	22.67
23	C	J1:8/2	A	J2:5/1	43.16
24	B	J1:5/2	A	J2:5/1	39.29
27	C	J1:8/2	B	J1:3/2	56.16
28	A	J1:2/2	B	J1:3/1	22.67
30	A	J1:2/2	B	J1:3/3	22.65
31	D	J2:2/2	B	J1:3/1	21.65
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	15.37
34	B	J1:5/2	D	J2:6/1	16.32
35	D	J2:2/3	C	J1:7/1	59.09
36	E	J2:4/3	C	J1:7/1	44.39
37	A	J1:2/3	C	J1:7/1	47.41
38	B	J1:5/1	C	J1:7/1	65.36
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	42.98
43	C	J1:8/2	C	J1:7/1	-
44	C	J1:8/2	B	J1:3/3	55.80

Basic Results Summary

45	C	J1:8/2	B	J1:3/1	57.27
46	C	J1:8/2	E	J2:3/1	30.61
47	C	J1:8/2	D	J2:6/1	17.70

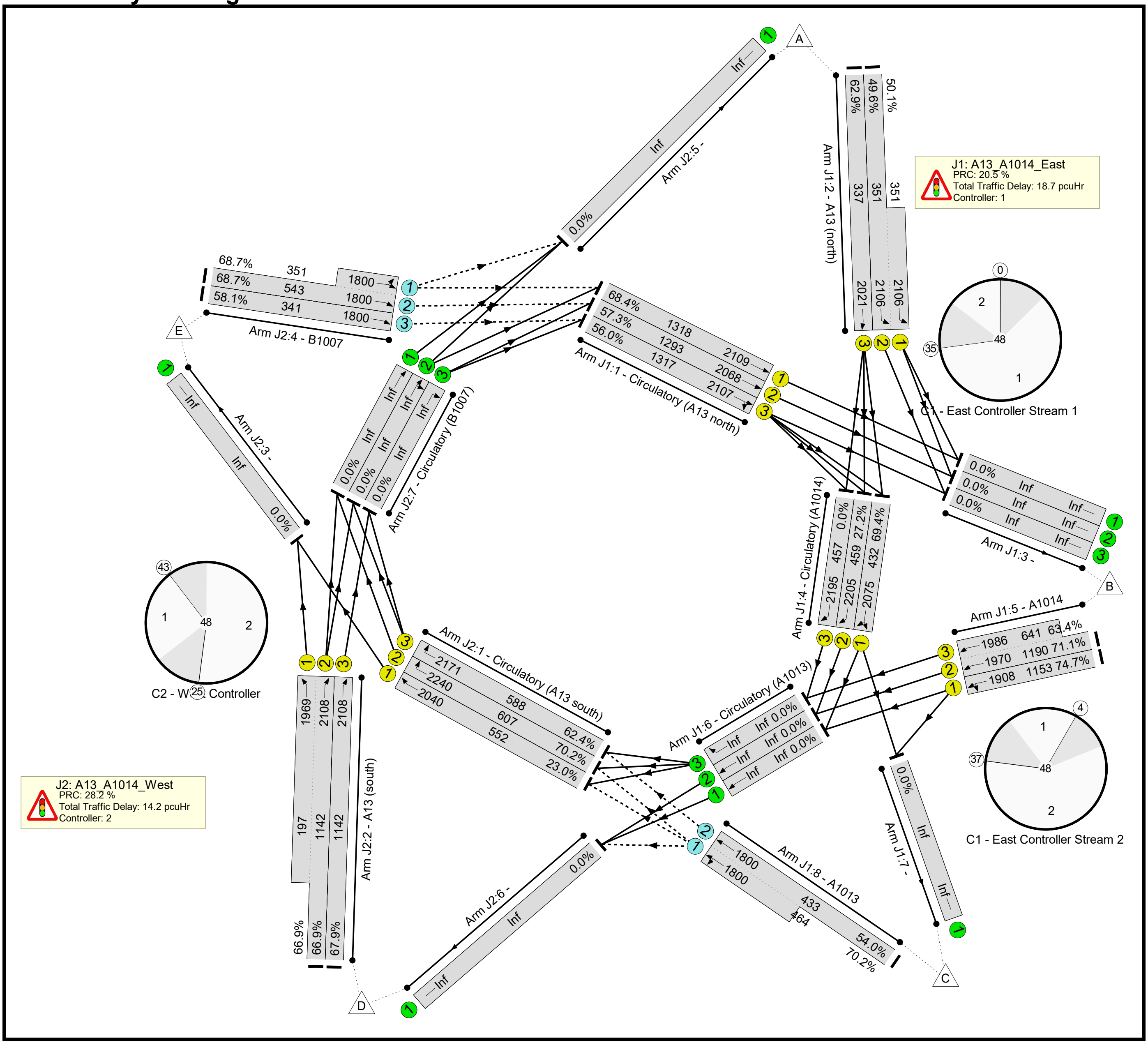
Traffic Flows, Actual

Actual Flow :

		Destination					
		A	B	C	D	E	Tot.
Origin	A	0	314	142	0	0	456
	B	802	0	237	2010	0	3049
	C	144	53	0	32	75	304
	D	0	1791	10	0	139	1940
	E	56	240	23	61	0	380
	Tot.	1002	2398	412	2103	214	6129

Scenario 3: 'PM Base + Com (Demand)' (FG3: 'PM Base + Com (Demand)', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

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: A13/A1014	-	-	-		-	-	-	-	-	-	**74.7%**	**2546**	**0**	**0**	**32.9**	-	-
J1: A13_A1014_East	-	-	-		-	-	-	-	-	-	**74.7%**	**1120**	**0**	**0**	**18.7**	-	-
1/1	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	902	2109	1318	68.4%	-	-	-	1.3	5.3	4.6
1/2	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	740	2068	1293	57.3%	-	-	-	1.2	6.1	4.4
1/3	Circulatory (A13 north) Ahead Right	U	C1:A		1	29	-	737	2107	1317	56.0%	-	-	-	1.1	5.5	3.3
2/2+2/1	A13 (north) Left	U	C1:B		1	7	-	350	2106:2106	351+351	49.6 : 50.1%	-	-	-	2.3 (1.1+1.1)	23.3 (23.3:23.3)	2.6
2/3	A13 (north) Ahead	U	C1:B		1	7	-	212	2021	337	62.9%	-	-	-	1.9	32.9	3.4
4/1	Circulatory (A1014) Right Ahead	U	C1:C		1	9	-	300	2075	432	69.4%	-	-	-	1.7	21.0	2.5
4/2	Circulatory (A1014) Right	U	C1:C		1	9	-	125	2205	459	27.2%	-	-	-	0.9	25.3	1.8
4/3	Circulatory (A1014) Right	U	C1:C		1	9	-	0	2195	457	0.0%	-	-	-	0.0	0.0	0.0
5/1	A1014 Ahead Left	U	C1:D		1	28	-	861	1908	1153	74.7%	-	-	-	3.1	13.0	9.6
5/2+5/3	A1014 Ahead	U	C1:D		1	28	-	1252	1970:1986	1190+641	71.1 : 63.4%	-	-	-	3.2 (2.3+0.9)	9.1 (9.7:7.8)	8.8
8/2+8/1	A1013 Ahead Left	O	-		-	-	-	560	1800:1800	433+464	54.0 : 70.2%	1120	0	0	1.8 (0.8+1.1)	11.9 (11.6:12.1)	4.1
J2: A13_A1014_West	-	-	-		-	-	-	-	-	-	**70.2%**	**1426**	**0**	**0**	**14.2**	-	-
1/1	Circulatory (A13 south) Ahead	U	C2:A		1	12	-	127	2040	552	23.0%	-	-	-	0.9	24.3	1.5

Basic Results Summary

1/2	Circulatory (A13 south) Right	U	C2:A		1	12	-	426	2240	607	70.2%	-	-	-	2.9	24.8	6.2
1/3	Circulatory (A13 south) Right	U	C2:A		1	12	-	367	2171	588	62.4%	-	-	-	2.6	25.8	4.9
2/2+2/1	A13 (south) Ahead Ahead2	U	C2:B		1	25	-	896	2108:1969	1142+197	66.9 : 66.9%	-	-	-	2.9 (2.5+0.3)	11.6 (12.0:9.5)	8.2
2/3	A13 (south) Ahead	U	C2:B		1	25	-	775	2108	1142	67.9%	-	-	-	2.8	12.9	8.4
4/2+4/1	B1007 Left Ahead	O	-		-	-	-	614	1800:1800	543+351	68.7 : 68.7%	1228	0	0	1.2 (0.8+0.5)	7.3 (7.5:7.0)	2.5
4/3	B1007 Ahead	O	-		-	-	-	198	1800	341	58.1%	198	0	0	0.9	16.7	2.0

C1 - East Controller Stream: 1 PRC for Signalled Lanes (%): 31.5 Total Delay for Signalled Lanes (pcuHr): 7.92 Cycle Time (s): 48
C1 - East Controller Stream: 2 PRC for Signalled Lanes (%): 20.5 Total Delay for Signalled Lanes (pcuHr): 8.89 Cycle Time (s): 48
C2 - West Controller PRC for Signalled Lanes (%): 28.2 Total Delay for Signalled Lanes (pcuHr): 12.08 Cycle Time (s): 48
PRC Over All Lanes (%): 20.5 Total Delay Over All Lanes(pcuHr): 32.90

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E
A	0.0	28.3	58.8	0.0	0.0
B	48.9	0.0	18.0	21.1	0.0
C	57.0	74.3	0.0	17.1	46.4
D	0.0	31.6	69.0	0.0	14.5
E	12.0	24.4	71.8	68.9	0.0

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E
A	0.0	23.3	48.8	0.0	0.0
B	28.9	0.0	13.0	11.1	0.0
C	42.0	54.3	0.0	12.1	36.4
D	0.0	16.6	49.0	0.0	9.5
E	7.0	14.4	56.8	48.9	0.0

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 3: PM Base + Com (Demand)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	14.48
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	68.87
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	11.97
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	49.49
12	D	J2:2/3	B	J1:3/2	31.69
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	24.41
17	D	J2:2/3	B	J1:3/3	31.45
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	22.96
22	A	J1:2/2	B	J1:3/2	28.31
23	C	J1:8/2	A	J2:5/1	57.66
24	B	J1:5/2	A	J2:5/1	47.75
27	C	J1:8/2	B	J1:3/2	74.54
28	A	J1:2/2	B	J1:3/1	28.31
30	A	J1:2/2	B	J1:3/3	28.29
31	D	J2:2/2	B	J1:3/1	31.74
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	24.54
34	B	J1:5/2	D	J2:6/1	19.69
35	D	J2:2/3	C	J1:7/1	69.04
36	E	J2:4/3	C	J1:7/1	71.80
37	A	J1:2/3	C	J1:7/1	58.75
38	B	J1:5/1	C	J1:7/1	17.96
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	55.70
43	C	J1:8/2	C	J1:7/1	-
44	C	J1:8/2	B	J1:3/3	74.13

Basic Results Summary

45	C	J1:8/2	B	J1:3/1	74.59
46	C	J1:8/2	E	J2:3/1	46.44
47	C	J1:8/2	D	J2:6/1	17.11

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 3: PM Base + Com (Demand)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	9.48
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	48.87
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	6.97
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	29.49
12	D	J2:2/3	B	J1:3/2	16.69
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	14.41
17	D	J2:2/3	B	J1:3/3	16.45
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	12.96
22	A	J1:2/2	B	J1:3/2	23.31
23	C	J1:8/2	A	J2:5/1	42.66
24	B	J1:5/2	A	J2:5/1	27.75
27	C	J1:8/2	B	J1:3/2	54.54
28	A	J1:2/2	B	J1:3/1	23.31
30	A	J1:2/2	B	J1:3/3	23.29
31	D	J2:2/2	B	J1:3/1	16.74
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	14.54
34	B	J1:5/2	D	J2:6/1	9.69
35	D	J2:2/3	C	J1:7/1	49.04
36	E	J2:4/3	C	J1:7/1	56.80
37	A	J1:2/3	C	J1:7/1	48.75
38	B	J1:5/1	C	J1:7/1	12.96
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	40.70
43	C	J1:8/2	C	J1:7/1	-
44	C	J1:8/2	B	J1:3/3	54.13

Basic Results Summary

45	C	J1:8/2	B	J1:3/1	54.59
46	C	J1:8/2	E	J2:3/1	36.44
47	C	J1:8/2	D	J2:6/1	12.11

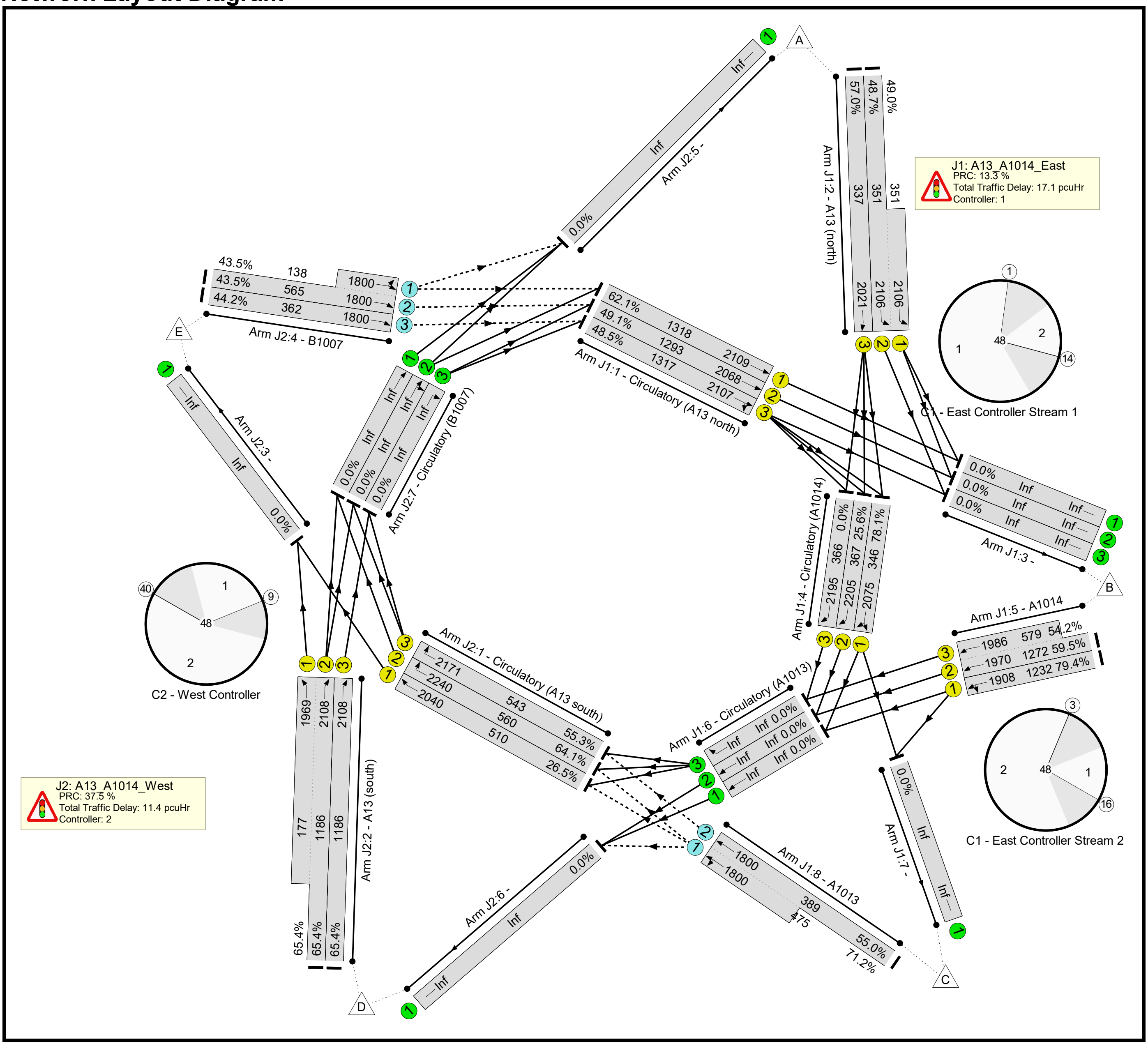
Traffic Flows, Actual

Actual Flow :

	Destination						
		A	B	C	D	E	Tot.
Origin	A	0	350	212	0	0	562
	B	406	0	225	1482	0	2113
	C	236	151	0	46	127	560
	D	0	1524	15	0	132	1671
	E	123	491	73	125	0	812
	Tot.	765	2516	525	1653	259	5718

Scenario 4: 'AM Base + Com + Dev Worst Case (Demand)' (FG4: 'AM Base + Com + Dev Worst Case (Demand)', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

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: A13/A1014	-	-	-		-	-	-	-	-	-	**79.4%**	**1876**	**0**	**0**	**28.5**	-	-
J1: A13_A1014_East	-	-	-		-	-	-	-	-	-	**79.4%**	**1104**	**0**	**0**	**17.1**	-	-
1/1	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	818	2109	1318	62.1%	-	-	-	1.0	4.5	2.0
1/2	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	635	2068	1293	49.1%	-	-	-	0.9	5.2	2.9
1/3	Circulatory (A13 north) Ahead Right	U	C1:A		1	29	-	639	2107	1317	48.5%	-	-	-	0.8	4.7	2.3
2/2+2/1	A13 (north) Left	U	C1:B		1	7	-	343	2106:2106	351+351	48.7 : 49.0%	-	-	-	2.2 (1.1+1.1)	23.2 (23.2:23.2)	2.5
2/3	A13 (north) Ahead	U	C1:B		1	7	-	192	2021	337	57.0%	-	-	-	1.6	30.7	3.0
4/1	Circulatory (A1014) Right Ahead	U	C1:C		1	7	-	270	2075	346	78.1%	-	-	-	2.5	33.2	3.2
4/2	Circulatory (A1014) Right	U	C1:C		1	7	-	94	2205	367	25.6%	-	-	-	0.7	26.6	1.4
4/3	Circulatory (A1014) Right	U	C1:C		1	7	-	0	2195	366	0.0%	-	-	-	0.0	0.0	0.0
5/1	A1014 Ahead Left	U	C1:D		1	30	-	979	1908	1232	79.4%	-	-	-	3.6	13.2	11.2
5/2+5/3	A1014 Ahead	U	C1:D		1	30	-	1071	1970:1986	1272+579	59.5 : 54.2%	-	-	-	2.0 (1.5+0.5)	6.8 (7.2:5.9)	6.4
8/2+8/1	A1013 Ahead Left	O	-		-	-	-	552	1800:1800	389+475	55.0 : 71.2%	1104	0	0	1.7 (0.6+1.1)	11.3 (10.5:11.8)	4.1
J2: A13_A1014_West	-	-	-		-	-	-	-	-	-	**65.4%**	**772**	**0**	**0**	**11.4**	-	-
1/1	Circulatory (A13 south) Ahead	U	C2:A		1	11	-	135	2040	510	26.5%	-	-	-	0.9	23.7	1.5

Basic Results Summary

1/2	Circulatory (A13 south) Right	U	C2:A		1	11	-	359	2240	560	64.1%	-	-	-	2.4	24.2	5.0
1/3	Circulatory (A13 south) Right	U	C2:A		1	11	-	300	2171	543	55.3%	-	-	-	2.0	23.5	3.7
2/2+2/1	A13 (south) Ahead Ahead2	U	C2:B		1	26	-	892	2108:1969	1186+177	65.4 : 65.4%	-	-	-	2.7 (2.4+0.3)	10.8 (11.1:8.7)	8.1
2/3	A13 (south) Ahead	U	C2:B		1	26	-	775	2108	1186	65.4%	-	-	-	2.5	11.6	8.0
4/2+4/1	B1007 Left Ahead	O	-		-	-	-	306	1800:1800	565+138	43.5 : 43.5%	612	0	0	0.4 (0.3+0.1)	4.9 (5.0:4.7)	1.0
4/3	B1007 Ahead	O	-		-	-	-	160	1800	362	44.2%	160	0	0	0.5	12.1	1.3

C1 - East Controller Stream: 1 PRC for Signalled Lanes (%): 45.0 Total Delay for Signalled Lanes (pcuHr): 6.61 Cycle Time (s): 48
C1 - East Controller Stream: 2 PRC for Signalled Lanes (%): 13.3 Total Delay for Signalled Lanes (pcuHr): 8.80 Cycle Time (s): 48
C2 - West Controller PRC for Signalled Lanes (%): 37.5 Total Delay for Signalled Lanes (pcuHr): 10.43 Cycle Time (s): 48
PRC Over All Lanes (%): 13.3 Total Delay Over All Lanes(pcuHr): 28.53

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E
A	0.0	28.2	69.9	0.0	0.0
B	47.2	0.0	18.2	20.0	0.0
C	53.0	67.3	0.0	16.8	45.5
D	0.0	30.2	77.2	0.0	13.7
E	9.7	21.5	76.7	64.9	0.0

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E
A	0.0	23.2	59.9	0.0	0.0
B	27.2	0.0	13.2	10.0	0.0
C	38.0	47.3	0.0	11.8	35.5
D	0.0	15.2	57.2	0.0	8.7
E	4.7	11.5	61.7	44.9	0.0

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 4: AM Base + Com + Dev Worst Case (Demand)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	13.72
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	64.93
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	9.70
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	47.73
12	D	J2:2/3	B	J1:3/2	30.05
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	21.48
17	D	J2:2/3	B	J1:3/3	29.95
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	23.19
22	A	J1:2/2	B	J1:3/2	28.18
23	C	J1:8/2	A	J2:5/1	55.13
24	B	J1:5/2	A	J2:5/1	45.88
27	C	J1:8/2	B	J1:3/2	67.52
28	A	J1:2/2	B	J1:3/1	28.18
30	A	J1:2/2	B	J1:3/3	28.17
31	D	J2:2/2	B	J1:3/1	30.33
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	21.87
34	B	J1:5/2	D	J2:6/1	17.20
35	D	J2:2/3	C	J1:7/1	77.16
36	E	J2:4/3	C	J1:7/1	76.70
37	A	J1:2/3	C	J1:7/1	69.88
38	B	J1:5/1	C	J1:7/1	18.19
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	50.41
43	C	J1:8/2	C	J1:7/1	-

Basic Results Summary

44	C	J1:8/2	B	J1:3/3	67.06
45	C	J1:8/2	B	J1:3/1	67.33
46	C	J1:8/2	E	J2:3/1	45.47
47	C	J1:8/2	D	J2:6/1	16.78

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 4: AM Base + Com + Dev Worst Case (Demand)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	8.72
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	44.93
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	4.70
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	27.73
12	D	J2:2/3	B	J1:3/2	15.05
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	11.48
17	D	J2:2/3	B	J1:3/3	14.95
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	13.19
22	A	J1:2/2	B	J1:3/2	23.18
23	C	J1:8/2	A	J2:5/1	40.13
24	B	J1:5/2	A	J2:5/1	25.88
27	C	J1:8/2	B	J1:3/2	47.52
28	A	J1:2/2	B	J1:3/1	23.18
30	A	J1:2/2	B	J1:3/3	23.17
31	D	J2:2/2	B	J1:3/1	15.33
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	11.87
34	B	J1:5/2	D	J2:6/1	7.20
35	D	J2:2/3	C	J1:7/1	57.16
36	E	J2:4/3	C	J1:7/1	61.70
37	A	J1:2/3	C	J1:7/1	59.88
38	B	J1:5/1	C	J1:7/1	13.19
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	35.41
43	C	J1:8/2	C	J1:7/1	-

Basic Results Summary

44	C	J1:8/2	B	J1:3/3	47.06
45	C	J1:8/2	B	J1:3/1	47.33
46	C	J1:8/2	E	J2:3/1	35.47
47	C	J1:8/2	D	J2:6/1	11.78

Traffic Flows, Actual

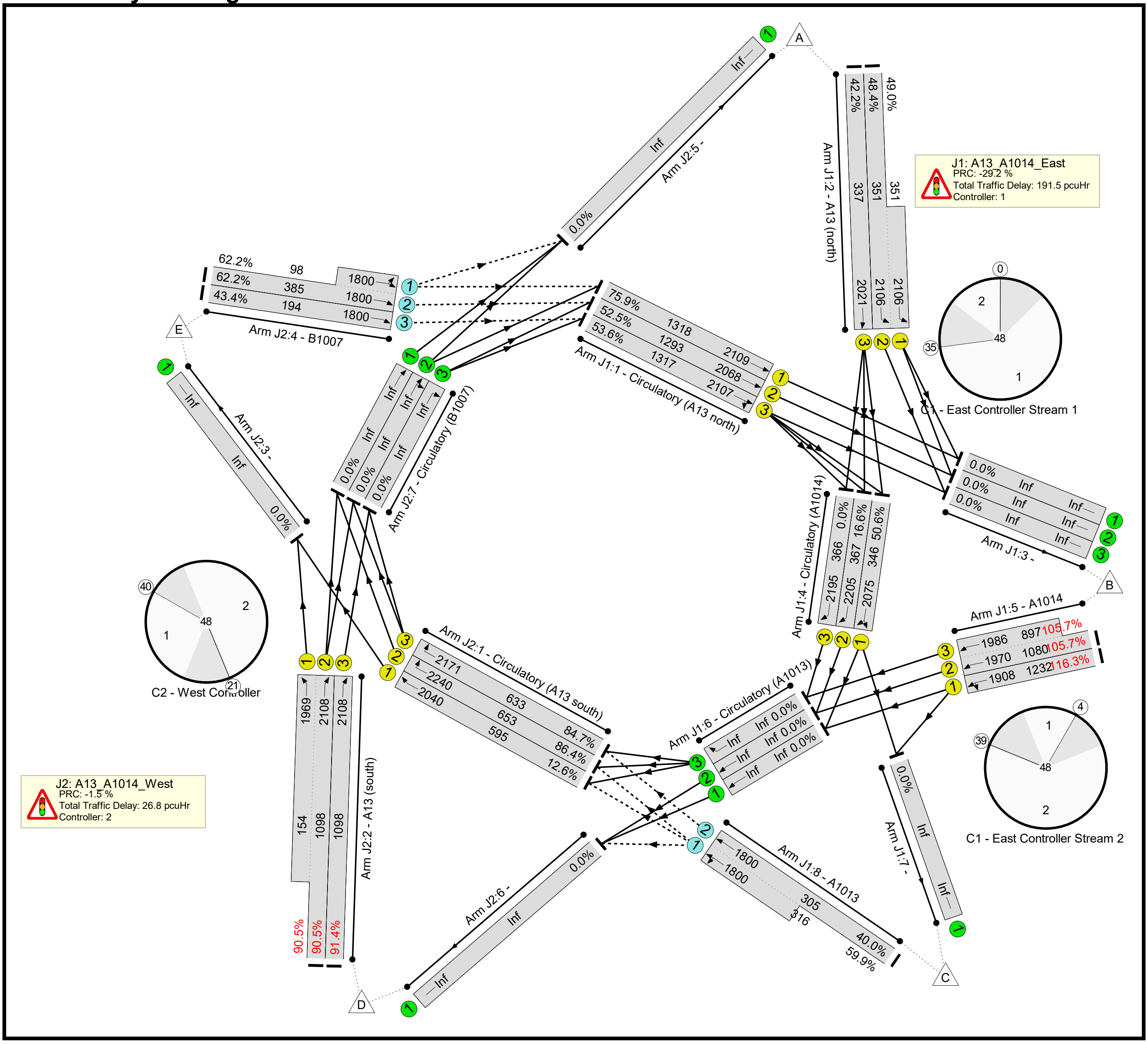
Actual Flow :

	Destination						
		A	B	C	D	E	Tot.
Origin	A	0	343	192	0	0	535
	B	314	0	293	1443	0	2050
	C	243	102	0	72	135	552
	D	0	1539	12	0	116	1667
	E	27	279	66	94	0	466
	Tot.	584	2263	563	1609	251	5270

Basic Results Summary

Scenario 5: 'I/P Base + Com + Dev Worst Case (Demand)' (FG5: 'I/P Base + Com + Dev Worst Case (Demand)', 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: A13/A1014	-	-	-		-	-	-	-	-	-	**116.3%**	**1306**	**0**	**0**	**218.3**	-	-
J1: A13_A1014_East	-	-	-		-	-	-	-	-	-	**116.3%**	**622**	**0**	**0**	**191.5**	-	-
1/1	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	1000	2109	1318	75.9%	-	-	-	1.6	5.7	4.5
1/2	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	679	2068	1293	52.5%	-	-	-	0.8	4.4	3.0
1/3	Circulatory (A13 north) Ahead Right	U	C1:A		1	29	-	706	2107	1317	53.6%	-	-	-	0.8	4.0	1.9
2/2+2/1	A13 (north) Left	U	C1:B		1	7	-	342	2106:2106	351+351	48.4 : 49.0%	-	-	-	2.2 (1.1+1.1)	23.2 (23.1:23.2)	2.5
2/3	A13 (north) Ahead	U	C1:B		1	7	-	142	2021	337	42.2%	-	-	-	1.1	27.1	2.1
4/1	Circulatory (A1014) Right Ahead	U	C1:C		1	7	-	175	2075	346	50.6%	-	-	-	0.8	16.0	1.3
4/2	Circulatory (A1014) Right	U	C1:C		1	7	-	61	2205	367	16.6%	-	-	-	0.4	26.5	0.9
4/3	Circulatory (A1014) Right	U	C1:C		1	7	-	0	2195	366	0.0%	-	-	-	0.0	0.0	0.0
5/1	A1014 Ahead Left	U	C1:D		1	30	-	1433	1908	1232	116.3%	-	-	-	111.4	279.9	125.9
5/2+5/3	A1014 Ahead	U	C1:D		1	30	-	2090	1970:1986	1080+897	105.7 : 105.7%	-	-	-	70.8 (38.8+31.9)	121.9 (122.4:121.3)	117.3
8/2+8/1	A1013 Ahead Left	O	-		-	-	-	311	1800:1800	305+316	40.0 : 59.9%	622	0	0	1.6 (0.6+1.0)	18.1 (17.4:18.5)	2.5
J2: A13_A1014_West	-	-	-		-	-	-	-	-	-	**91.4%**	**684**	**0**	**0**	**26.8**	-	-

Basic Results Summary

1/1	Circulatory (A13 south) Ahead	U	C2:A		1	13	-	75	2040	595	12.6%	-	-	-	0.4	21.3	1.1
1/2	Circulatory (A13 south) Right	U	C2:A		1	13	-	592	2240	653	86.4%	-	-	-	4.9	31.4	10.1
1/3	Circulatory (A13 south) Right	U	C2:A		1	13	-	560	2171	633	84.7%	-	-	-	4.7	31.2	9.4
2/2+2/1	A13 (south) Ahead Ahead2	U	C2:B		1	24	-	1133	2108:1969	1098+154	90.5 : 90.5%	-	-	-	7.6 (6.8+0.8)	24.0 (24.6:20.1)	16.3
2/3	A13 (south) Ahead	U	C2:B		1	24	-	1003	2108	1098	91.4%	-	-	-	7.7	27.7	16.8
4/2+4/1	B1007 Left Ahead	O	-		-	-	-	300	1800:1800	385+98	62.2 : 62.2%	600	0	0	1.0 (0.8+0.2)	11.8 (11.9:11.1)	1.9
4/3	B1007 Ahead	O	-		-	-	-	84	1800	194	43.4%	84	0	0	0.6	23.9	1.0

C1 - East Controller Stream: 1 PRC for Signalled Lanes (%): 18.6 Total Delay for Signalled Lanes (pcuHr): 6.48 Cycle Time (s): 48
C1 - East Controller Stream: 2 PRC for Signalled Lanes (%): -29.2 Total Delay for Signalled Lanes (pcuHr): 183.42 Cycle Time (s): 48
C2 - West Controller PRC for Signalled Lanes (%): -1.5 Total Delay for Signalled Lanes (pcuHr): 25.31 Cycle Time (s): 48
PRC Over All Lanes (%): -29.2 Total Delay Over All Lanes(pcuHr): 218.31

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E
A	0.0	28.2	49.6	0.0	0.0
B	170.9	0.0	284.9	212.1	0.0
C	71.9	92.8	0.0	23.5	49.8
D	0.0	45.6	82.2	0.0	25.1
E	16.1	27.0	76.1	76.7	0.0

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E
A	0.0	23.2	39.6	0.0	0.0
B	150.9	0.0	279.9	202.1	0.0
C	56.9	72.8	0.0	18.5	39.8
D	0.0	30.6	62.2	0.0	20.1
E	11.1	17.0	61.1	56.7	0.0

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 5: I/P Base + Com + Dev Worst Case (Demand)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	25.09
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	76.73
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	16.13
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	171.48
12	D	J2:2/3	B	J1:3/2	45.90
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	26.93
17	D	J2:2/3	B	J1:3/3	45.83
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	289.86
22	A	J1:2/2	B	J1:3/2	28.16
23	C	J1:8/2	A	J2:5/1	72.42
24	B	J1:5/2	A	J2:5/1	170.30
27	C	J1:8/2	B	J1:3/2	92.89
28	A	J1:2/2	B	J1:3/1	28.16
30	A	J1:2/2	B	J1:3/3	28.15
31	D	J2:2/2	B	J1:3/1	45.27
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	28.97
34	B	J1:5/2	D	J2:6/1	132.44
35	D	J2:2/3	C	J1:7/1	82.23
36	E	J2:4/3	C	J1:7/1	76.09
37	A	J1:2/3	C	J1:7/1	49.64
38	B	J1:5/1	C	J1:7/1	284.86
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	71.27
43	C	J1:8/2	C	J1:7/1	-

Basic Results Summary

44	C	J1:8/2	B	J1:3/3	92.70
45	C	J1:8/2	B	J1:3/1	95.33
46	C	J1:8/2	E	J2:3/1	49.79
47	C	J1:8/2	D	J2:6/1	23.47

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 5: I/P Base + Com + Dev Worst Case (Demand)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	20.09
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	56.73
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	11.13
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	151.48
12	D	J2:2/3	B	J1:3/2	30.90
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	16.93
17	D	J2:2/3	B	J1:3/3	30.83
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	279.86
22	A	J1:2/2	B	J1:3/2	23.16
23	C	J1:8/2	A	J2:5/1	57.42
24	B	J1:5/2	A	J2:5/1	150.30
27	C	J1:8/2	B	J1:3/2	72.89
28	A	J1:2/2	B	J1:3/1	23.16
30	A	J1:2/2	B	J1:3/3	23.15
31	D	J2:2/2	B	J1:3/1	30.27
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	18.97
34	B	J1:5/2	D	J2:6/1	122.44
35	D	J2:2/3	C	J1:7/1	62.23
36	E	J2:4/3	C	J1:7/1	61.09
37	A	J1:2/3	C	J1:7/1	39.64
38	B	J1:5/1	C	J1:7/1	279.86
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	56.27
43	C	J1:8/2	C	J1:7/1	-

Basic Results Summary

44	C	J1:8/2	B	J1:3/3	72.70
45	C	J1:8/2	B	J1:3/1	75.33
46	C	J1:8/2	E	J2:3/1	39.79
47	C	J1:8/2	D	J2:6/1	18.47

Traffic Flows, Actual

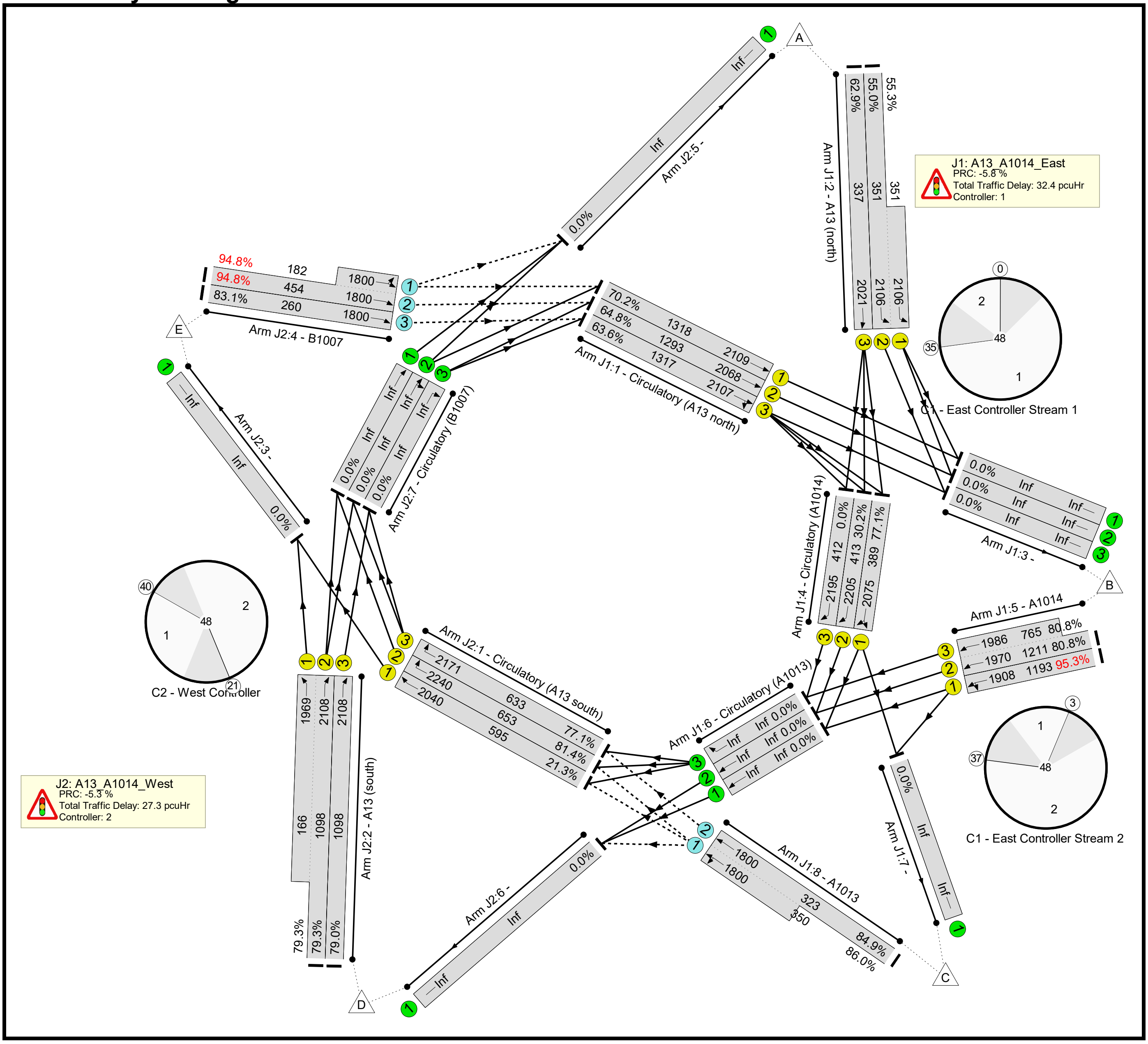
Actual Flow :

	Destination						
		A	B	C	D	E	Tot.
Origin	A	0	342	142	0	0	484
	B	948	0	264	2311	0	3523
	C	144	60	0	32	75	311
	D	0	1987	10	0	139	2136
	E	56	244	23	61	0	384
	Tot.	1148	2633	439	2404	214	6838

Basic Results Summary

Scenario 6: 'PM Base + Com + Dev Worst Case (Demand)' (FG6: 'PM Base + Com + Dev Worst Case (Demand)', 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: A13/A1014	-	-	-		-	-	-	-	-	-	**95.3%**	**2572**	**0**	**0**	**59.7**	-	-
J1: A13_A1014_East	-	-	-		-	-	-	-	-	-	**95.3%**	**1150**	**0**	**0**	**32.4**	-	-
1/1	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	925	2109	1318	70.2%	-	-	-	1.2	4.9	5.3
1/2	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	838	2068	1293	64.8%	-	-	-	1.7	7.3	6.3
1/3	Circulatory (A13 north) Ahead Right	U	C1:A		1	29	-	837	2107	1317	63.6%	-	-	-	1.5	6.7	6.2
2/2+2/1	A13 (north) Left	U	C1:B		1	7	-	387	2106:2106	351+351	55.0 : 55.3%	-	-	-	2.6 (1.3+1.3)	24.0 (24.0:24.1)	3.0
2/3	A13 (north) Ahead	U	C1:B		1	7	-	212	2021	337	62.9%	-	-	-	1.9	32.9	3.4
4/1	Circulatory (A1014) Right Ahead	U	C1:C		1	8	-	300	2075	389	77.1%	-	-	-	2.4	28.4	3.4
4/2	Circulatory (A1014) Right	U	C1:C		1	8	-	125	2205	413	30.2%	-	-	-	0.9	25.6	1.9
4/3	Circulatory (A1014) Right	U	C1:C		1	8	-	0	2195	412	0.0%	-	-	-	0.0	0.0	0.0
5/1	A1014 Ahead Left	U	C1:D		1	29	-	1136	1908	1193	95.3%	-	-	-	10.5	33.3	21.7
5/2+5/3	A1014 Ahead	U	C1:D		1	29	-	1596	1970:1986	1211+765	80.8 : 80.8%	-	-	-	4.7 (3.1+1.6)	10.7 (11.4:9.6)	11.6
8/2+8/1	A1013 Ahead Left	O	-		-	-	-	575	1800:1800	323+350	84.9 : 86.0%	1150	0	0	4.9 (2.3+2.5)	30.4 (30.9:30.0)	6.4
J2: A13_A1014_West	-	-	-		-	-	-	-	-	-	**94.8%**	**1422**	**0**	**0**	**27.3**	-	-
1/1	Circulatory (A13 south) Ahead	U	C2:A		1	13	-	127	2040	595	21.3%	-	-	-	0.8	23.2	1.8

Basic Results Summary

1/2	Circulatory (A13 south) Right	U	C2:A		1	13	-	532	2240	653	81.4%	-	-	-	4.2	28.3	8.8
1/3	Circulatory (A13 south) Right	U	C2:A		1	13	-	488	2171	633	77.1%	-	-	-	4.0	29.5	7.9
2/2+2/1	A13 (south) Ahead Ahead2	U	C2:B		1	24	-	1003	2108:1969	1098+166	79.3 : 79.3%	-	-	-	4.4 (3.9+0.5)	15.7 (16.2:12.7)	11.3
2/3	A13 (south) Ahead	U	C2:B		1	24	-	867	2108	1098	79.0%	-	-	-	4.1	17.0	11.2
4/2+4/1	B1007 Left Ahead	O	-		-	-	-	603	1800:1800	454+182	94.8 : 94.8%	1206	0	0	7.2 (5.3+1.9)	43.0 (44.1:40.1)	11.8
4/3	B1007 Ahead	O	-		-	-	-	216	1800	260	83.1%	216	0	0	2.7	44.6	3.9

C1 - East Controller	Stream: 1	PRC for Signalled Lanes (%):	28.2	Total Delay for Signalled Lanes (pcuHr):	9.01	Cycle Time (s):	48
C1 - East Controller	Stream: 2	PRC for Signalled Lanes (%):	-5.8	Total Delay for Signalled Lanes (pcuHr):	18.49	Cycle Time (s):	48
C2 - West Controller		PRC for Signalled Lanes (%):	10.5	Total Delay for Signalled Lanes (pcuHr):	17.47	Cycle Time (s):	48
		PRC Over All Lanes (%):	-5.8	Total Delay Over All Lanes(pcuHr):	59.71		

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E
A	0.0	29.0	66.8	0.0	0.0
B	55.3	0.0	38.3	31.7	0.0
C	79.5	101.8	0.0	35.0	63.2
D	0.0	36.2	81.5	0.0	17.7
E	45.1	60.9	106.7	98.2	0.0

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E
A	0.0	24.0	56.8	0.0	0.0
B	35.3	0.0	33.3	21.7	0.0
C	64.5	81.8	0.0	30.0	53.2
D	0.0	21.2	61.5	0.0	12.7
E	40.1	50.9	91.7	78.2	0.0

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 6: PM Base + Com + Dev Worst Case (Demand)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	17.73
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	98.21
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	45.13
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	55.73
12	D	J2:2/3	B	J1:3/2	36.88
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	61.23
17	D	J2:2/3	B	J1:3/3	36.48
18	E	J2:4/3	B	J1:3/3	62.61
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	43.26
22	A	J1:2/2	B	J1:3/2	29.06
23	C	J1:8/2	A	J2:5/1	79.95
24	B	J1:5/2	A	J2:5/1	54.36
27	C	J1:8/2	B	J1:3/2	102.00
28	A	J1:2/2	B	J1:3/1	29.06
30	A	J1:2/2	B	J1:3/3	29.04
31	D	J2:2/2	B	J1:3/1	35.86
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	57.22
34	B	J1:5/2	D	J2:6/1	21.39
35	D	J2:2/3	C	J1:7/1	81.53
36	E	J2:4/3	C	J1:7/1	106.68
37	A	J1:2/3	C	J1:7/1	66.78
38	B	J1:5/1	C	J1:7/1	38.26
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	79.03
43	C	J1:8/2	C	J1:7/1	-

Basic Results Summary

44	C	J1:8/2	B	J1:3/3	101.64
45	C	J1:8/2	B	J1:3/1	101.30
46	C	J1:8/2	E	J2:3/1	63.18
47	C	J1:8/2	D	J2:6/1	35.02

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 6: PM Base + Com + Dev Worst Case (Demand)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	12.73
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	78.21
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	40.13
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	35.73
12	D	J2:2/3	B	J1:3/2	21.88
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	51.23
17	D	J2:2/3	B	J1:3/3	21.48
18	E	J2:4/3	B	J1:3/3	52.61
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	33.26
22	A	J1:2/2	B	J1:3/2	24.06
23	C	J1:8/2	A	J2:5/1	64.95
24	B	J1:5/2	A	J2:5/1	34.36
27	C	J1:8/2	B	J1:3/2	82.00
28	A	J1:2/2	B	J1:3/1	24.06
30	A	J1:2/2	B	J1:3/3	24.04
31	D	J2:2/2	B	J1:3/1	20.86
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	47.22
34	B	J1:5/2	D	J2:6/1	11.39
35	D	J2:2/3	C	J1:7/1	61.53
36	E	J2:4/3	C	J1:7/1	91.68
37	A	J1:2/3	C	J1:7/1	56.78
38	B	J1:5/1	C	J1:7/1	33.26
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	64.03
43	C	J1:8/2	C	J1:7/1	-

Basic Results Summary

44	C	J1:8/2	B	J1:3/3	81.64
45	C	J1:8/2	B	J1:3/1	81.30
46	C	J1:8/2	E	J2:3/1	53.18
47	C	J1:8/2	D	J2:6/1	30.02

Traffic Flows, Actual

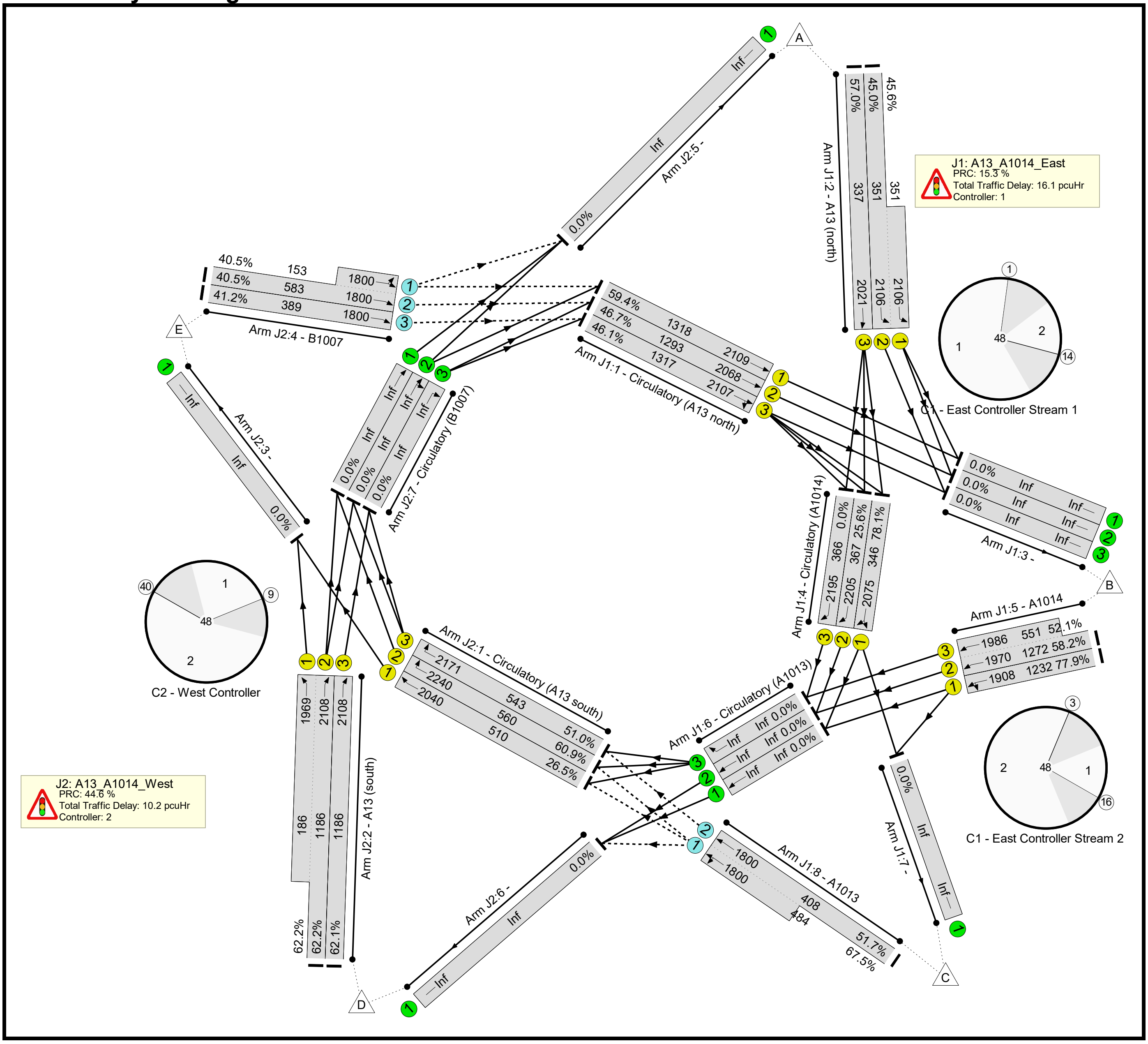
Actual Flow :

	Destination						
		A	B	C	D	E	Tot.
Origin	A	0	387	212	0	0	599
	B	618	0	265	1849	0	2732
	C	236	166	0	46	127	575
	D	0	1723	15	0	132	1870
	E	123	498	73	125	0	819
	Tot.	977	2774	565	2020	259	6595

Basic Results Summary

Scenario 7: 'AM Base + Com + Dev Scenario 1 (Demand)' (FG7: 'AM Base + Com + Dev Scenario 1 (Demand)', 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: A13/A1014	-	-	-		-	-	-	-	-	-	**78.1%**	**1832**	**0**	**0**	**26.4**	-	-
J1: A13_A1014_East	-	-	-		-	-	-	-	-	-	**78.1%**	**1076**	**0**	**0**	**16.1**	-	-
1/1	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	783	2109	1318	59.4%	-	-	-	0.9	4.2	1.4
1/2	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	603	2068	1293	46.7%	-	-	-	0.8	5.0	2.5
1/3	Circulatory (A13 north) Ahead Right	U	C1:A		1	29	-	607	2107	1317	46.1%	-	-	-	0.8	4.5	2.1
2/2+2/1	A13 (north) Left	U	C1:B		1	7	-	318	2106:2106	351+351	45.0 : 45.6%	-	-	-	2.0 (1.0+1.0)	22.7 (22.7:22.7)	2.3
2/3	A13 (north) Ahead	U	C1:B		1	7	-	192	2021	337	57.0%	-	-	-	1.6	30.7	3.0
4/1	Circulatory (A1014) Right Ahead	U	C1:C		1	7	-	270	2075	346	78.1%	-	-	-	2.5	33.3	3.2
4/2	Circulatory (A1014) Right	U	C1:C		1	7	-	94	2205	367	25.6%	-	-	-	0.7	27.1	1.4
4/3	Circulatory (A1014) Right	U	C1:C		1	7	-	0	2195	366	0.0%	-	-	-	0.0	0.0	0.0
5/1	A1014 Ahead Left	U	C1:D		1	30	-	960	1908	1232	77.9%	-	-	-	3.4	12.6	10.8
5/2+5/3	A1014 Ahead	U	C1:D		1	30	-	1028	1970:1986	1272+551	58.2 : 52.1%	-	-	-	1.9 (1.5+0.5)	6.7 (7.1:5.8)	6.2
8/2+8/1	A1013 Ahead Left	O	-		-	-	-	538	1800:1800	408+484	51.7 : 67.5%	1076	0	0	1.5 (0.5+0.9)	9.9 (9.1:10.4)	3.8
J2: A13_A1014_West	-	-	-		-	-	-	-	-	-	**62.2%**	**756**	**0**	**0**	**10.2**	-	-
1/1	Circulatory (A13 south) Ahead	U	C2:A		1	11	-	135	2040	510	26.5%	-	-	-	0.9	22.8	1.5

Basic Results Summary

1/2	Circulatory (A13 south) Right	U	C2:A		1	11	-	341	2240	560	60.9%	-	-	-	2.2	23.0	4.7
1/3	Circulatory (A13 south) Right	U	C2:A		1	11	-	277	2171	543	51.0%	-	-	-	1.7	21.7	3.2
2/2+2/1	A13 (south) Ahead Ahead2	U	C2:B		1	26	-	854	2108:1969	1186+186	62.2 : 62.2%	-	-	-	2.4 (2.2+0.3)	10.2 (10.5:8.4)	7.4
2/3	A13 (south) Ahead	U	C2:B		1	26	-	736	2108	1186	62.1%	-	-	-	2.3	11.0	7.4
4/2+4/1	B1007 Left Ahead	O	-		-	-	-	298	1800:1800	583+153	40.5 : 40.5%	596	0	0	0.4 (0.3+0.1)	4.5 (4.5:4.3)	0.9
4/3	B1007 Ahead	O	-		-	-	-	160	1800	389	41.2%	160	0	0	0.5	10.5	1.1

C1 - East Controller Stream: 1 PRC for Signalled Lanes (%): 51.5 Total Delay for Signalled Lanes (pcuHr): 6.17 Cycle Time (s): 48
C1 - East Controller Stream: 2 PRC for Signalled Lanes (%): 15.3 Total Delay for Signalled Lanes (pcuHr): 8.48 Cycle Time (s): 48
C2 - West Controller PRC for Signalled Lanes (%): 44.6 Total Delay for Signalled Lanes (pcuHr): 9.39 Cycle Time (s): 48
PRC Over All Lanes (%): 15.3 Total Delay Over All Lanes(pcuHr): 26.36

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E
A	0.0	27.7	69.9	0.0	0.0
B	46.3	0.0	17.6	19.7	0.0
C	49.4	63.3	0.0	15.4	43.2
D	0.0	29.4	76.7	0.0	13.4
E	9.3	20.9	75.4	63.7	0.0

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E
A	0.0	22.7	59.9	0.0	0.0
B	26.3	0.0	12.6	9.7	0.0
C	34.4	43.3	0.0	10.4	33.2
D	0.0	14.4	56.7	0.0	8.4
E	4.3	10.9	60.4	43.7	0.0

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 7: AM Base + Com + Dev Scenario 1 (Demand)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	13.38
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	63.67
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	9.31
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	46.73
12	D	J2:2/3	B	J1:3/2	29.33
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	20.86
17	D	J2:2/3	B	J1:3/3	29.24
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	22.59
22	A	J1:2/2	B	J1:3/2	27.74
23	C	J1:8/2	A	J2:5/1	52.09
24	B	J1:5/2	A	J2:5/1	44.84
27	C	J1:8/2	B	J1:3/2	63.43
28	A	J1:2/2	B	J1:3/1	27.74
30	A	J1:2/2	B	J1:3/3	27.72
31	D	J2:2/2	B	J1:3/1	29.55
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	21.21
34	B	J1:5/2	D	J2:6/1	17.09
35	D	J2:2/3	C	J1:7/1	76.68
36	E	J2:4/3	C	J1:7/1	75.43
37	A	J1:2/3	C	J1:7/1	69.88
38	B	J1:5/1	C	J1:7/1	17.59
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	46.70
43	C	J1:8/2	C	J1:7/1	-

Basic Results Summary

44	C	J1:8/2	B	J1:3/3	63.12
45	C	J1:8/2	B	J1:3/1	63.26
46	C	J1:8/2	E	J2:3/1	43.21
47	C	J1:8/2	D	J2:6/1	15.42

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 7: AM Base + Com + Dev Scenario 1 (Demand)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	8.38
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	43.67
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	4.31
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	26.73
12	D	J2:2/3	B	J1:3/2	14.33
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	10.86
17	D	J2:2/3	B	J1:3/3	14.24
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	12.59
22	A	J1:2/2	B	J1:3/2	22.74
23	C	J1:8/2	A	J2:5/1	37.09
24	B	J1:5/2	A	J2:5/1	24.84
27	C	J1:8/2	B	J1:3/2	43.43
28	A	J1:2/2	B	J1:3/1	22.74
30	A	J1:2/2	B	J1:3/3	22.72
31	D	J2:2/2	B	J1:3/1	14.55
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	11.21
34	B	J1:5/2	D	J2:6/1	7.09
35	D	J2:2/3	C	J1:7/1	56.68
36	E	J2:4/3	C	J1:7/1	60.43
37	A	J1:2/3	C	J1:7/1	59.88
38	B	J1:5/1	C	J1:7/1	12.59
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	31.70
43	C	J1:8/2	C	J1:7/1	-

Basic Results Summary

44	C	J1:8/2	B	J1:3/3	43.12
45	C	J1:8/2	B	J1:3/1	43.26
46	C	J1:8/2	E	J2:3/1	33.21
47	C	J1:8/2	D	J2:6/1	10.42

Traffic Flows, Actual

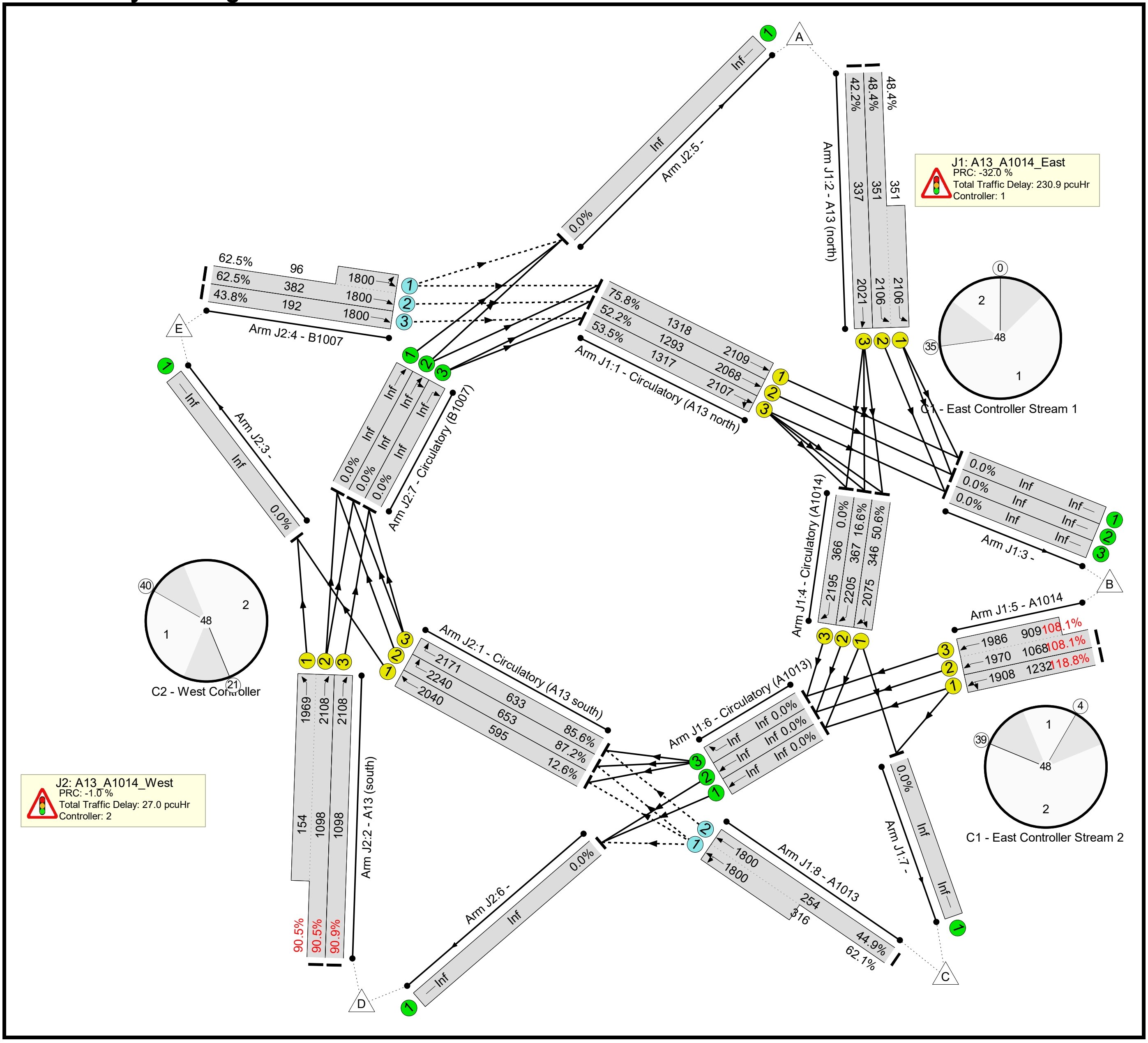
Actual Flow :

	Destination						
		A	B	C	D	E	Tot.
Origin	A	0	318	192	0	0	510
	B	287	0	287	1414	0	1988
	C	243	88	0	72	135	538
	D	0	1462	12	0	116	1590
	E	27	271	66	94	0	458
	Tot.	557	2139	557	1580	251	5084

Basic Results Summary

Scenario 8: 'I/P Base + Com + Dev Scenario 1 (Demand)' (FG8: 'I/P Base + Com + Dev Scenario 1 (Demand)', 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: A13/A1014	-	-	-		-	-	-	-	-	-	**118.8%**	**1302**	**0**	**0**	**258.0**	-	-
J1: A13_A1014_East	-	-	-		-	-	-	-	-	-	**118.8%**	**620**	**0**	**0**	**230.9**	-	-
1/1	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	999	2109	1318	75.8%	-	-	-	1.6	5.7	4.5
1/2	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	675	2068	1293	52.2%	-	-	-	0.8	4.4	3.0
1/3	Circulatory (A13 north) Ahead Right	U	C1:A		1	29	-	704	2107	1317	53.5%	-	-	-	0.8	4.0	1.9
2/2+2/1	A13 (north) Left	U	C1:B		1	7	-	340	2106:2106	351+351	48.4 : 48.4%	-	-	-	2.2 (1.1+1.1)	23.1 (23.1:23.1)	2.5
2/3	A13 (north) Ahead	U	C1:B		1	7	-	142	2021	337	42.2%	-	-	-	1.1	27.1	2.1
4/1	Circulatory (A1014) Right Ahead	U	C1:C		1	7	-	175	2075	346	50.6%	-	-	-	0.8	16.0	1.3
4/2	Circulatory (A1014) Right	U	C1:C		1	7	-	61	2205	367	16.6%	-	-	-	0.4	26.5	0.9
4/3	Circulatory (A1014) Right	U	C1:C		1	7	-	0	2195	366	0.0%	-	-	-	0.0	0.0	0.0
5/1	A1014 Ahead Left	U	C1:D		1	30	-	1464	1908	1232	118.8%	-	-	-	127.6	313.7	142.2
5/2+5/3	A1014 Ahead	U	C1:D		1	30	-	2138	1970:1986	1068+909	108.1 : 108.1%	-	-	-	94.0 (50.9+43.1)	158.4 (158.8:157.8)	140.6
8/2+8/1	A1013 Ahead Left	O	-		-	-	-	310	1800:1800	254+316	44.9 : 62.1%	620	0	0	1.7 (0.6+1.1)	19.2 (18.4:19.7)	2.8
J2: A13_A1014_West	-	-	-		-	-	-	-	-	-	**90.9%**	**682**	**0**	**0**	**27.0**	-	-

Basic Results Summary

1/1	Circulatory (A13 south) Ahead	U	C2:A		1	13	-	75	2040	595	12.6%	-	-	-	0.4	21.2	1.1
1/2	Circulatory (A13 south) Right	U	C2:A		1	13	-	609	2240	653	87.2%	-	-	-	5.2	32.6	10.4
1/3	Circulatory (A13 south) Right	U	C2:A		1	13	-	577	2171	633	85.6%	-	-	-	4.8	32.0	9.7
2/2+2/1	A13 (south) Ahead Ahead2	U	C2:B		1	24	-	1133	2108:1969	1098+154	90.5 : 90.5%	-	-	-	7.6 (6.8+0.8)	24.0 (24.6:20.1)	16.3
2/3	A13 (south) Ahead	U	C2:B		1	24	-	998	2108	1098	90.9%	-	-	-	7.5	27.0	16.5
4/2+4/1	B1007 Left Ahead	O	-		-	-	-	299	1800:1800	382+96	62.5 : 62.5%	598	0	0	1.0 (0.8+0.2)	12.0 (12.2:11.4)	2.0
4/3	B1007 Ahead	O	-		-	-	-	84	1800	192	43.8%	84	0	0	0.6	24.1	1.0

C1 - East Controller Stream: 1 PRC for Signalled Lanes (%): 18.7 Total Delay for Signalled Lanes (pcuHr): 6.44 Cycle Time (s): 48
C1 - East Controller Stream: 2 PRC for Signalled Lanes (%): -32.0 Total Delay for Signalled Lanes (pcuHr): 222.83 Cycle Time (s): 48
C2 - West Controller PRC for Signalled Lanes (%): -1.0 Total Delay for Signalled Lanes (pcuHr): 25.47 Cycle Time (s): 48
PRC Over All Lanes (%): -32.0 Total Delay Over All Lanes(pcuHr): 257.96

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E
A	0.0	28.1	49.6	0.0	0.0
B	208.5	0.0	318.7	247.5	0.0
C	74.1	94.9	0.0	24.7	50.9
D	0.0	45.2	81.5	0.0	25.1
E	16.4	27.1	76.2	76.9	0.0

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E
A	0.0	23.1	39.6	0.0	0.0
B	188.5	0.0	313.7	237.5	0.0
C	59.1	74.9	0.0	19.7	40.9
D	0.0	30.2	61.5	0.0	20.1
E	11.4	17.1	61.2	56.9	0.0

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 8: I/P Base + Com + Dev Scenario 1 (Demand)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	25.09
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	76.87
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	16.36
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	209.11
12	D	J2:2/3	B	J1:3/2	45.11
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	27.11
17	D	J2:2/3	B	J1:3/3	45.05
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	323.68
22	A	J1:2/2	B	J1:3/2	28.12
23	C	J1:8/2	A	J2:5/1	74.61
24	B	J1:5/2	A	J2:5/1	207.77
27	C	J1:8/2	B	J1:3/2	94.97
28	A	J1:2/2	B	J1:3/1	28.12
30	A	J1:2/2	B	J1:3/3	28.12
31	D	J2:2/2	B	J1:3/1	45.26
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	29.15
34	B	J1:5/2	D	J2:6/1	168.79
35	D	J2:2/3	C	J1:7/1	81.50
36	E	J2:4/3	C	J1:7/1	76.23
37	A	J1:2/3	C	J1:7/1	49.64
38	B	J1:5/1	C	J1:7/1	318.68
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	73.35
43	C	J1:8/2	C	J1:7/1	-

Basic Results Summary

44	C	J1:8/2	B	J1:3/3	94.78
45	C	J1:8/2	B	J1:3/1	97.43
46	C	J1:8/2	E	J2:3/1	50.86
47	C	J1:8/2	D	J2:6/1	24.68

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 8: I/P Base + Com + Dev Scenario 1 (Demand)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	20.09
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	56.87
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	11.36
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	189.11
12	D	J2:2/3	B	J1:3/2	30.11
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	17.11
17	D	J2:2/3	B	J1:3/3	30.05
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	313.68
22	A	J1:2/2	B	J1:3/2	23.12
23	C	J1:8/2	A	J2:5/1	59.61
24	B	J1:5/2	A	J2:5/1	187.77
27	C	J1:8/2	B	J1:3/2	74.97
28	A	J1:2/2	B	J1:3/1	23.12
30	A	J1:2/2	B	J1:3/3	23.12
31	D	J2:2/2	B	J1:3/1	30.26
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	19.15
34	B	J1:5/2	D	J2:6/1	158.79
35	D	J2:2/3	C	J1:7/1	61.50
36	E	J2:4/3	C	J1:7/1	61.23
37	A	J1:2/3	C	J1:7/1	39.64
38	B	J1:5/1	C	J1:7/1	313.68
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	58.35
43	C	J1:8/2	C	J1:7/1	-

Basic Results Summary

44	C	J1:8/2	B	J1:3/3	74.78
45	C	J1:8/2	B	J1:3/1	77.43
46	C	J1:8/2	E	J2:3/1	40.86
47	C	J1:8/2	D	J2:6/1	19.68

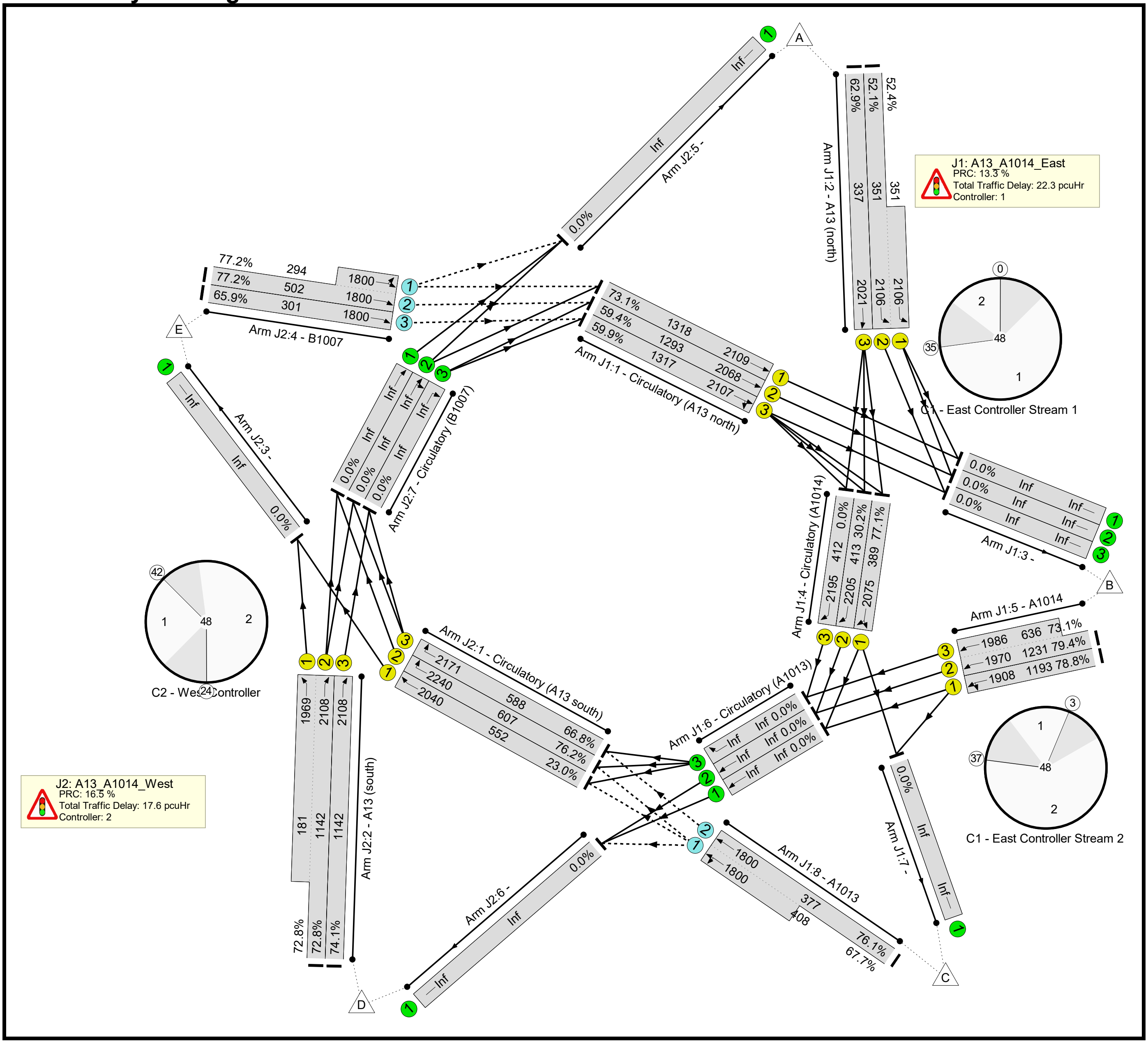
Traffic Flows, Actual

Actual Flow :

	Destination						
		A	B	C	D	E	Tot.
Origin	A	0	340	142	0	0	482
	B	983	0	271	2348	0	3602
	C	144	59	0	32	75	310
	D	0	1982	10	0	139	2131
	E	56	243	23	61	0	383
	Tot.	1183	2624	446	2441	214	6908

Scenario 9: 'PM Base + Com + Dev Scenario 1 (Demand)' (FG9: 'PM Base + Com + Dev Scenario 1 (Demand)', 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: A13/A1014	-	-	-		-	-	-	-	-	-	**79.4%**	**2554**	**0**	**0**	**39.9**	-	-
J1: A13_A1014_East	-	-	-		-	-	-	-	-	-	**79.4%**	**1126**	**0**	**0**	**22.3**	-	-
1/1	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	964	2109	1318	73.1%	-	-	-	1.6	6.0	6.1
1/2	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	768	2068	1293	59.4%	-	-	-	1.4	6.4	5.4
1/3	Circulatory (A13 north) Ahead Right	U	C1:A		1	29	-	789	2107	1317	59.9%	-	-	-	1.3	5.7	3.8
2/2+2/1	A13 (north) Left	U	C1:B		1	7	-	367	2106:2106	351+351	52.1 : 52.4%	-	-	-	2.4 (1.2+1.2)	23.6 (23.6:23.6)	2.7
2/3	A13 (north) Ahead	U	C1:B		1	7	-	212	2021	337	62.9%	-	-	-	1.9	32.9	3.4
4/1	Circulatory (A1014) Right Ahead	U	C1:C		1	8	-	300	2075	389	77.1%	-	-	-	2.4	28.8	3.4
4/2	Circulatory (A1014) Right	U	C1:C		1	8	-	125	2205	413	30.2%	-	-	-	0.9	27.3	1.9
4/3	Circulatory (A1014) Right	U	C1:C		1	8	-	0	2195	412	0.0%	-	-	-	0.0	0.0	0.0
5/1	A1014 Ahead Left	U	C1:D		1	29	-	940	1908	1193	78.8%	-	-	-	3.6	13.7	11.0
5/2+5/3	A1014 Ahead	U	C1:D		1	29	-	1443	1970:1986	1231+636	79.4 : 73.1%	-	-	-	4.1 (3.0+1.1)	10.2 (10.9:8.6)	11.2
8/2+8/1	A1013 Ahead Left	O	-		-	-	-	563	1800:1800	377+408	76.1 : 67.7%	1126	0	0	2.7 (1.5+1.3)	17.4 (18.3:16.4)	4.5
J2: A13_A1014_West	-	-	-		-	-	-	-	-	-	**77.2%**	**1428**	**0**	**0**	**17.6**	-	-
1/1	Circulatory (A13 south) Ahead	U	C2:A		1	12	-	127	2040	552	23.0%	-	-	-	0.9	26.2	1.6

Basic Results Summary

1/2	Circulatory (A13 south) Right	U	C2:A		1	12	-	462	2240	607	76.2%	-	-	-	3.4	26.7	7.2
1/3	Circulatory (A13 south) Right	U	C2:A		1	12	-	393	2171	588	66.8%	-	-	-	3.3	30.0	5.8
2/2+2/1	A13 (south) Ahead Ahead2	U	C2:B		1	25	-	963	2108:1969	1142+181	72.8 : 72.8%	-	-	-	3.4 (3.1+0.4)	12.9 (13.3:10.4)	9.6
2/3	A13 (south) Ahead	U	C2:B		1	25	-	846	2108	1142	74.1%	-	-	-	3.4	14.5	9.9
4/2+4/1	B1007 Left Ahead	O	-		-	-	-	615	1800:1800	502+294	77.2 : 77.2%	1230	0	0	1.9 (1.2+0.7)	11.2 (11.5:10.6)	3.5
4/3	B1007 Ahead	O	-		-	-	-	198	1800	301	65.9%	198	0	0	1.3	22.9	2.4

C1 - East Controller Stream: 1 PRC for Signalled Lanes (%): 23.1 Total Delay for Signalled Lanes (pcuHr): 8.57 Cycle Time (s): 48
C1 - East Controller Stream: 2 PRC for Signalled Lanes (%): 13.3 Total Delay for Signalled Lanes (pcuHr): 10.99 Cycle Time (s): 48
C2 - West Controller PRC for Signalled Lanes (%): 18.2 Total Delay for Signalled Lanes (pcuHr): 14.47 Cycle Time (s): 48
PRC Over All Lanes (%): 13.3 Total Delay Over All Lanes(pcuHr): 39.92

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E
A	0.0	28.6	66.8	0.0	0.0
B	52.6	0.0	18.7	22.1	0.0
C	66.1	86.1	0.0	21.4	52.7
D	0.0	33.5	77.3	0.0	15.4
E	15.6	28.4	86.9	78.5	0.0

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E
A	0.0	23.6	56.8	0.0	0.0
B	32.6	0.0	13.7	12.1	0.0
C	51.1	66.1	0.0	16.4	42.7
D	0.0	18.5	57.3	0.0	10.4
E	10.6	18.4	71.9	58.5	0.0

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 9: PM Base + Com + Dev Scenario 1 (Demand)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	15.40
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	78.47
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	15.64
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	53.09
12	D	J2:2/3	B	J1:3/2	33.49
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	28.34
17	D	J2:2/3	B	J1:3/3	33.26
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	23.68
22	A	J1:2/2	B	J1:3/2	28.63
23	C	J1:8/2	A	J2:5/1	66.09
24	B	J1:5/2	A	J2:5/1	50.91
27	C	J1:8/2	B	J1:3/2	86.03
28	A	J1:2/2	B	J1:3/1	28.63
30	A	J1:2/2	B	J1:3/3	28.63
31	D	J2:2/2	B	J1:3/1	33.68
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	28.67
34	B	J1:5/2	D	J2:6/1	20.91
35	D	J2:2/3	C	J1:7/1	77.27
36	E	J2:4/3	C	J1:7/1	86.92
37	A	J1:2/3	C	J1:7/1	66.78
38	B	J1:5/1	C	J1:7/1	18.68
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	66.08
43	C	J1:8/2	C	J1:7/1	-

Basic Results Summary

44	C	J1:8/2	B	J1:3/3	85.82
45	C	J1:8/2	B	J1:3/1	86.60
46	C	J1:8/2	E	J2:3/1	52.66
47	C	J1:8/2	D	J2:6/1	21.42

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 9: PM Base + Com + Dev Scenario 1 (Demand)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	10.40
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	58.47
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	10.64
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	33.09
12	D	J2:2/3	B	J1:3/2	18.49
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	18.34
17	D	J2:2/3	B	J1:3/3	18.26
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	13.68
22	A	J1:2/2	B	J1:3/2	23.63
23	C	J1:8/2	A	J2:5/1	51.09
24	B	J1:5/2	A	J2:5/1	30.91
27	C	J1:8/2	B	J1:3/2	66.03
28	A	J1:2/2	B	J1:3/1	23.63
30	A	J1:2/2	B	J1:3/3	23.63
31	D	J2:2/2	B	J1:3/1	18.68
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	18.67
34	B	J1:5/2	D	J2:6/1	10.91
35	D	J2:2/3	C	J1:7/1	57.27
36	E	J2:4/3	C	J1:7/1	71.92
37	A	J1:2/3	C	J1:7/1	56.78
38	B	J1:5/1	C	J1:7/1	13.68
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	51.08
43	C	J1:8/2	C	J1:7/1	-

Basic Results Summary

44	C	J1:8/2	B	J1:3/3	65.82
45	C	J1:8/2	B	J1:3/1	66.60
46	C	J1:8/2	E	J2:3/1	42.66
47	C	J1:8/2	D	J2:6/1	16.42

Traffic Flows, Actual

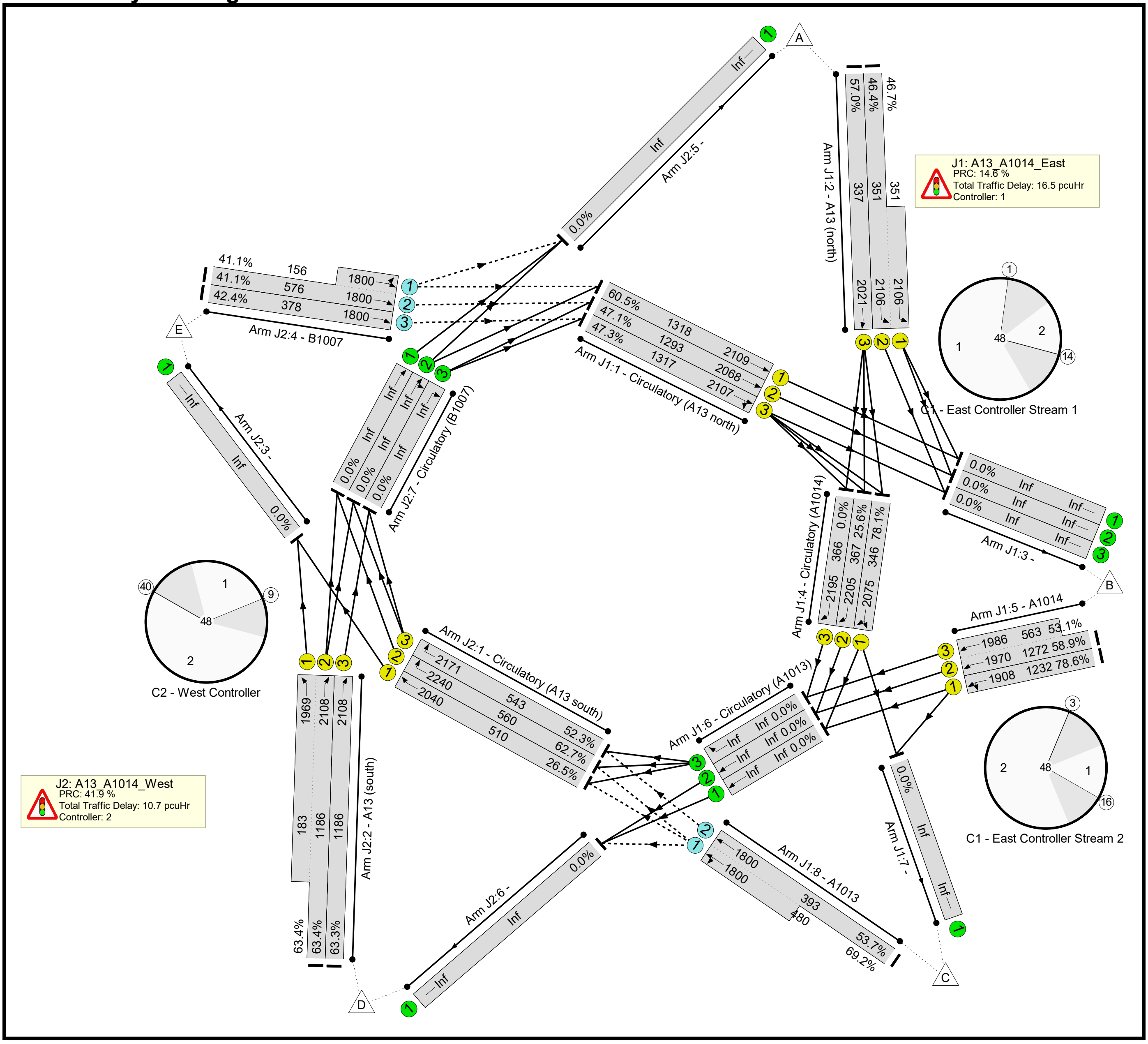
Actual Flow :

	Destination						
		A	B	C	D	E	Tot.
Origin	A	0	367	212	0	0	579
	B	465	0	234	1684	0	2383
	C	236	154	0	46	127	563
	D	0	1662	15	0	132	1809
	E	123	492	73	125	0	813
	Tot.	824	2675	534	1855	259	6147

Basic Results Summary

Scenario 10: 'AM Base + Com + Dev Scenario 2 (Demand)' (FG10: 'AM Base + Com + Dev Scenario 2 (Demand)', 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: A13/A1014	-	-	-		-	-	-	-	-	-	**78.6%**	**1848**	**0**	**0**	**27.2**	-	-
J1: A13_A1014_East	-	-	-		-	-	-	-	-	-	**78.6%**	**1086**	**0**	**0**	**16.5**	-	-
1/1	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	798	2109	1318	60.5%	-	-	-	1.0	4.3	1.5
1/2	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	609	2068	1293	47.1%	-	-	-	0.9	5.1	2.8
1/3	Circulatory (A13 north) Ahead Right	U	C1:A		1	29	-	623	2107	1317	47.3%	-	-	-	0.8	4.5	2.2
2/2+2/1	A13 (north) Left	U	C1:B		1	7	-	327	2106:2106	351+351	46.4 : 46.7%	-	-	-	2.1 (1.0+1.0)	22.9 (22.9:22.9)	2.4
2/3	A13 (north) Ahead	U	C1:B		1	7	-	192	2021	337	57.0%	-	-	-	1.6	30.7	3.0
4/1	Circulatory (A1014) Right Ahead	U	C1:C		1	7	-	270	2075	346	78.1%	-	-	-	2.5	33.3	3.2
4/2	Circulatory (A1014) Right	U	C1:C		1	7	-	94	2205	367	25.6%	-	-	-	0.7	26.9	1.4
4/3	Circulatory (A1014) Right	U	C1:C		1	7	-	0	2195	366	0.0%	-	-	-	0.0	0.0	0.0
5/1	A1014 Ahead Left	U	C1:D		1	30	-	968	1908	1232	78.6%	-	-	-	3.5	12.8	10.9
5/2+5/3	A1014 Ahead	U	C1:D		1	30	-	1048	1970:1986	1272+563	58.9 : 53.1%	-	-	-	2.0 (1.5+0.5)	6.8 (7.1:5.8)	6.3
8/2+8/1	A1013 Ahead Left	O	-		-	-	-	543	1800:1800	393+480	53.7 : 69.2%	1086	0	0	1.6 (0.6+1.0)	10.6 (9.8:11.1)	4.0
J2: A13_A1014_West	-	-	-		-	-	-	-	-	-	**63.4%**	**762**	**0**	**0**	**10.7**	-	-
1/1	Circulatory (A13 south) Ahead	U	C2:A		1	11	-	135	2040	510	26.5%	-	-	-	0.9	23.2	1.5

Basic Results Summary

1/2	Circulatory (A13 south) Right	U	C2:A		1	11	-	351	2240	560	62.7%	-	-	-	2.3	23.6	4.8
1/3	Circulatory (A13 south) Right	U	C2:A		1	11	-	284	2171	543	52.3%	-	-	-	1.8	22.4	3.3
2/2+2/1	A13 (south) Ahead Ahead2	U	C2:B		1	26	-	868	2108:1969	1186+183	63.4 : 63.4%	-	-	-	2.5 (2.2+0.3)	10.4 (10.7:8.5)	7.5
2/3	A13 (south) Ahead	U	C2:B		1	26	-	751	2108	1186	63.3%	-	-	-	2.3	11.3	7.5
4/2+4/1	B1007 Left Ahead	O	-		-	-	-	301	1800:1800	576+156	41.1 : 41.1%	602	0	0	0.4 (0.3+0.1)	4.6 (4.6:4.4)	0.9
4/3	B1007 Ahead	O	-		-	-	-	160	1800	378	42.4%	160	0	0	0.5	11.1	1.2

C1 - East Controller Stream: 1 PRC for Signalled Lanes (%): 48.7 Total Delay for Signalled Lanes (pcuHr): 6.33 Cycle Time (s): 48
C1 - East Controller Stream: 2 PRC for Signalled Lanes (%): 14.6 Total Delay for Signalled Lanes (pcuHr): 8.62 Cycle Time (s): 48
C2 - West Controller PRC for Signalled Lanes (%): 41.9 Total Delay for Signalled Lanes (pcuHr): 9.80 Cycle Time (s): 48
PRC Over All Lanes (%): 14.6 Total Delay Over All Lanes(pcuHr): 27.22

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E
A	0.0	27.9	69.9	0.0	0.0
B	46.7	0.0	17.8	19.8	0.0
C	51.0	64.9	0.0	16.1	44.3
D	0.0	29.7	76.9	0.0	13.5
E	9.4	21.0	75.9	64.1	0.0

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E
A	0.0	22.9	59.9	0.0	0.0
B	26.7	0.0	12.8	9.8	0.0
C	36.0	44.9	0.0	11.1	34.3
D	0.0	14.7	56.9	0.0	8.5
E	4.4	11.0	60.9	44.1	0.0

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 10: AM Base + Com + Dev Scenario 2 (Demand)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	13.50
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	64.14
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	9.38
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	47.26
12	D	J2:2/3	B	J1:3/2	29.57
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	20.99
17	D	J2:2/3	B	J1:3/3	29.52
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	22.83
22	A	J1:2/2	B	J1:3/2	27.89
23	C	J1:8/2	A	J2:5/1	53.62
24	B	J1:5/2	A	J2:5/1	45.14
27	C	J1:8/2	B	J1:3/2	65.08
28	A	J1:2/2	B	J1:3/1	27.89
30	A	J1:2/2	B	J1:3/3	27.88
31	D	J2:2/2	B	J1:3/1	29.84
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	21.38
34	B	J1:5/2	D	J2:6/1	17.14
35	D	J2:2/3	C	J1:7/1	76.87
36	E	J2:4/3	C	J1:7/1	75.91
37	A	J1:2/3	C	J1:7/1	69.88
38	B	J1:5/1	C	J1:7/1	17.83
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	48.22
43	C	J1:8/2	C	J1:7/1	-

Basic Results Summary

44	C	J1:8/2	B	J1:3/3	64.72
45	C	J1:8/2	B	J1:3/1	64.92
46	C	J1:8/2	E	J2:3/1	44.32
47	C	J1:8/2	D	J2:6/1	16.10

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 10: AM Base + Com + Dev Scenario 2 (Demand)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	8.50
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	44.14
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	4.38
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	27.26
12	D	J2:2/3	B	J1:3/2	14.57
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	10.99
17	D	J2:2/3	B	J1:3/3	14.52
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	12.83
22	A	J1:2/2	B	J1:3/2	22.89
23	C	J1:8/2	A	J2:5/1	38.62
24	B	J1:5/2	A	J2:5/1	25.14
27	C	J1:8/2	B	J1:3/2	45.08
28	A	J1:2/2	B	J1:3/1	22.89
30	A	J1:2/2	B	J1:3/3	22.88
31	D	J2:2/2	B	J1:3/1	14.84
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	11.38
34	B	J1:5/2	D	J2:6/1	7.14
35	D	J2:2/3	C	J1:7/1	56.87
36	E	J2:4/3	C	J1:7/1	60.91
37	A	J1:2/3	C	J1:7/1	59.88
38	B	J1:5/1	C	J1:7/1	12.83
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	33.22
43	C	J1:8/2	C	J1:7/1	-

Basic Results Summary

44	C	J1:8/2	B	J1:3/3	44.72
45	C	J1:8/2	B	J1:3/1	44.92
46	C	J1:8/2	E	J2:3/1	34.32
47	C	J1:8/2	D	J2:6/1	11.10

Traffic Flows, Actual

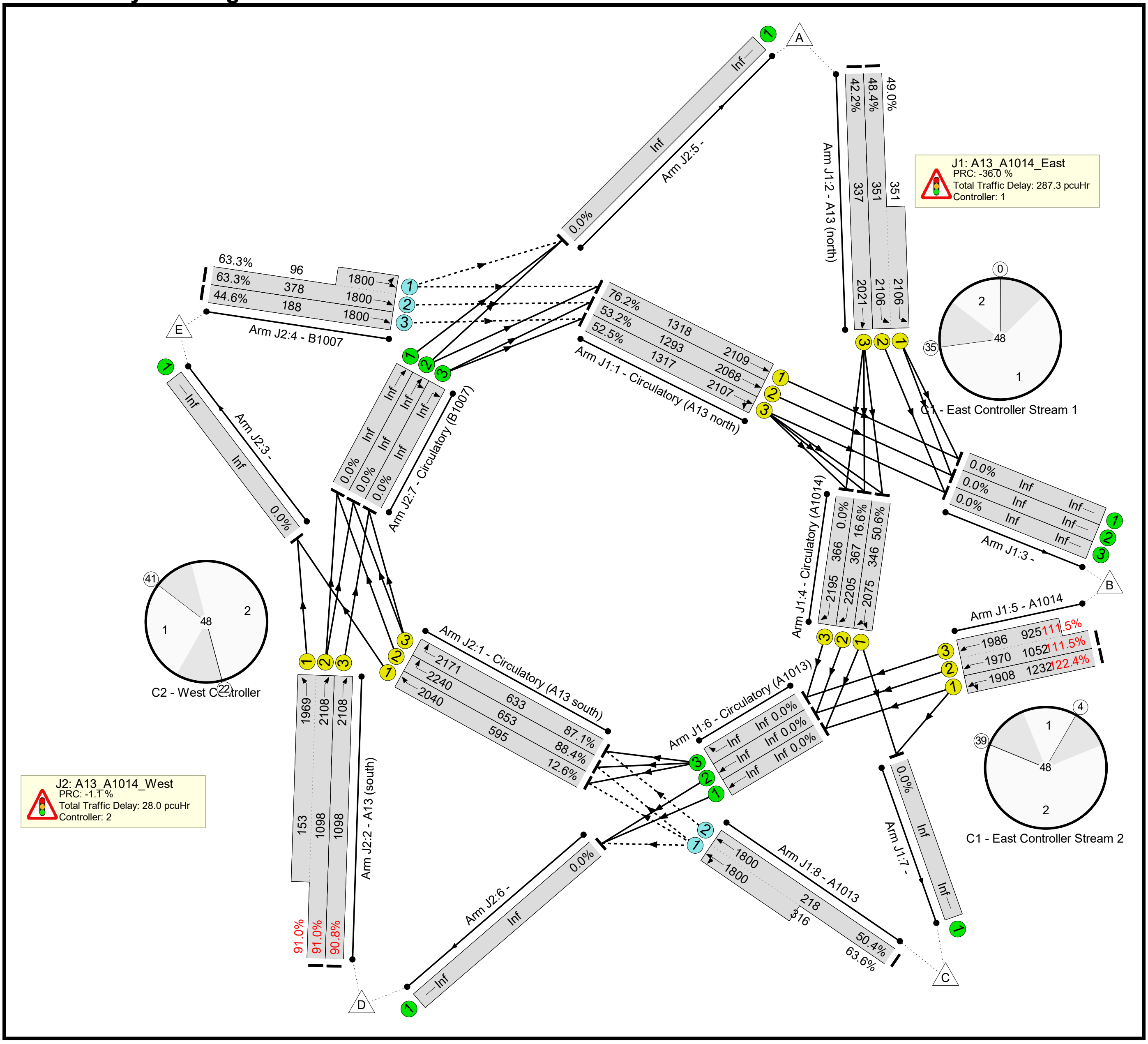
Actual Flow :

	Destination						
		A	B	C	D	E	Tot.
Origin	A	0	327	192	0	0	519
	B	299	0	290	1427	0	2016
	C	243	93	0	72	135	543
	D	0	1491	12	0	116	1619
	E	27	274	66	94	0	461
	Tot.	569	2185	560	1593	251	5158

Basic Results Summary

Scenario 11: 'I/P Base + Com + Dev Scenario 2 (Demand)' (FG11: 'I/P Base + Com + Dev Scenario 2 (Demand)', 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: A13/A1014	-	-	-		-	-	-	-	-	-	**122.4%**	**1306**	**0**	**0**	**315.4**	-	-
J1: A13_A1014_East	-	-	-		-	-	-	-	-	-	**122.4%**	**622**	**0**	**0**	**287.3**	-	-
1/1	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	1005	2109	1318	76.2%	-	-	-	1.6	5.9	4.5
1/2	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	687	2068	1293	53.2%	-	-	-	0.8	4.4	2.5
1/3	Circulatory (A13 north) Ahead Right	U	C1:A		1	29	-	692	2107	1317	52.5%	-	-	-	0.8	4.0	1.8
2/2+2/1	A13 (north) Left	U	C1:B		1	7	-	342	2106:2106	351+351	48.4 : 49.0%	-	-	-	2.2 (1.1+1.1)	23.2 (23.1:23.2)	2.5
2/3	A13 (north) Ahead	U	C1:B		1	7	-	142	2021	337	42.2%	-	-	-	1.1	27.1	2.1
4/1	Circulatory (A1014) Right Ahead	U	C1:C		1	7	-	175	2075	346	50.6%	-	-	-	0.8	16.2	1.3
4/2	Circulatory (A1014) Right	U	C1:C		1	7	-	61	2205	367	16.6%	-	-	-	0.5	28.0	0.9
4/3	Circulatory (A1014) Right	U	C1:C		1	7	-	0	2195	366	0.0%	-	-	-	0.0	0.0	0.0
5/1	A1014 Ahead Left	U	C1:D		1	30	-	1508	1908	1232	122.4%	-	-	-	150.6	359.6	165.5
5/2+5/3	A1014 Ahead	U	C1:D		1	30	-	2204	1970:1986	1052+925	111.5 : 111.5%	-	-	-	127.2 (67.8+59.4)	207.7 (208.1:207.3)	173.6
8/2+8/1	A1013 Ahead Left	O	-		-	-	-	311	1800:1800	218+316	50.4 : 63.6%	622	0	0	1.8 (0.6+1.2)	20.4 (19.4:20.9)	2.9
J2: A13_A1014_West	-	-	-		-	-	-	-	-	-	**91.0%**	**684**	**0**	**0**	**28.0**	-	-

Basic Results Summary

1/1	Circulatory (A13 south) Ahead	U	C2:A		1	13	-	75	2040	595	12.6%	-	-	-	0.5	22.1	1.1
1/2	Circulatory (A13 south) Right	U	C2:A		1	13	-	633	2240	653	88.4%	-	-	-	5.5	34.5	10.8
1/3	Circulatory (A13 south) Right	U	C2:A		1	13	-	602	2171	633	87.1%	-	-	-	5.2	33.9	10.1
2/2+2/1	A13 (south) Ahead Ahead2	U	C2:B		1	24	-	1138	2108:1969	1098+153	91.0 : 91.0%	-	-	-	7.8 (7.0+0.8)	24.7 (25.2:20.7)	16.6
2/3	A13 (south) Ahead	U	C2:B		1	24	-	997	2108	1098	90.8%	-	-	-	7.4	26.8	16.4
4/2+4/1	B1007 Left Ahead	O	-		-	-	-	300	1800:1800	378+96	63.3 : 63.3%	600	0	0	1.0 (0.8+0.2)	12.3 (12.5:11.7)	2.0
4/3	B1007 Ahead	O	-		-	-	-	84	1800	188	44.6%	84	0	0	0.6	24.8	1.0

C1 - East Controller	Stream: 1	PRC for Signalled Lanes (%):	18.0	Total Delay for Signalled Lanes (pcuHr):	6.52	Cycle Time (s):	48
C1 - East Controller	Stream: 2	PRC for Signalled Lanes (%):	-36.0	Total Delay for Signalled Lanes (pcuHr):	279.07	Cycle Time (s):	48
C2 - West Controller		PRC for Signalled Lanes (%):	-1.1	Total Delay for Signalled Lanes (pcuHr):	26.43	Cycle Time (s):	48
		PRC Over All Lanes (%):	-36.0	Total Delay Over All Lanes(pcuHr):	315.38		

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E
A	0.0	28.2	49.6	0.0	0.0
B	259.7	0.0	364.6	295.5	0.0
C	77.8	98.1	0.0	25.9	52.9
D	0.0	45.5	80.5	0.0	25.7
E	16.7	27.5	79.2	79.8	0.0

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E
A	0.0	23.2	39.6	0.0	0.0
B	239.7	0.0	359.6	285.5	0.0
C	62.8	78.1	0.0	20.9	42.9
D	0.0	30.5	60.5	0.0	20.7
E	11.7	17.5	64.2	59.8	0.0

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 11: I/P Base + Com + Dev Scenario 2 (Demand)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	25.71
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	79.79
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	16.65
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	260.34
12	D	J2:2/3	B	J1:3/2	44.99
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	27.46
17	D	J2:2/3	B	J1:3/3	44.86
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	369.62
22	A	J1:2/2	B	J1:3/2	28.16
23	C	J1:8/2	A	J2:5/1	78.24
24	B	J1:5/2	A	J2:5/1	259.09
27	C	J1:8/2	B	J1:3/2	98.15
28	A	J1:2/2	B	J1:3/1	28.16
30	A	J1:2/2	B	J1:3/3	28.15
31	D	J2:2/2	B	J1:3/1	46.07
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	29.56
34	B	J1:5/2	D	J2:6/1	218.06
35	D	J2:2/3	C	J1:7/1	80.46
36	E	J2:4/3	C	J1:7/1	79.16
37	A	J1:2/3	C	J1:7/1	49.64
38	B	J1:5/1	C	J1:7/1	364.62
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	77.04
43	C	J1:8/2	C	J1:7/1	-

Basic Results Summary

44	C	J1:8/2	B	J1:3/3	97.87
45	C	J1:8/2	B	J1:3/1	100.44
46	C	J1:8/2	E	J2:3/1	52.94
47	C	J1:8/2	D	J2:6/1	25.86

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 11: I/P Base + Com + Dev Scenario 2 (Demand)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	20.71
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	59.79
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	11.65
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	240.34
12	D	J2:2/3	B	J1:3/2	29.99
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	17.46
17	D	J2:2/3	B	J1:3/3	29.86
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	359.62
22	A	J1:2/2	B	J1:3/2	23.16
23	C	J1:8/2	A	J2:5/1	63.24
24	B	J1:5/2	A	J2:5/1	239.09
27	C	J1:8/2	B	J1:3/2	78.15
28	A	J1:2/2	B	J1:3/1	23.16
30	A	J1:2/2	B	J1:3/3	23.15
31	D	J2:2/2	B	J1:3/1	31.07
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	19.56
34	B	J1:5/2	D	J2:6/1	208.06
35	D	J2:2/3	C	J1:7/1	60.46
36	E	J2:4/3	C	J1:7/1	64.16
37	A	J1:2/3	C	J1:7/1	39.64
38	B	J1:5/1	C	J1:7/1	359.62
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	62.04
43	C	J1:8/2	C	J1:7/1	-

Basic Results Summary

44	C	J1:8/2	B	J1:3/3	77.87
45	C	J1:8/2	B	J1:3/1	80.44
46	C	J1:8/2	E	J2:3/1	42.94
47	C	J1:8/2	D	J2:6/1	20.86

Traffic Flows, Actual

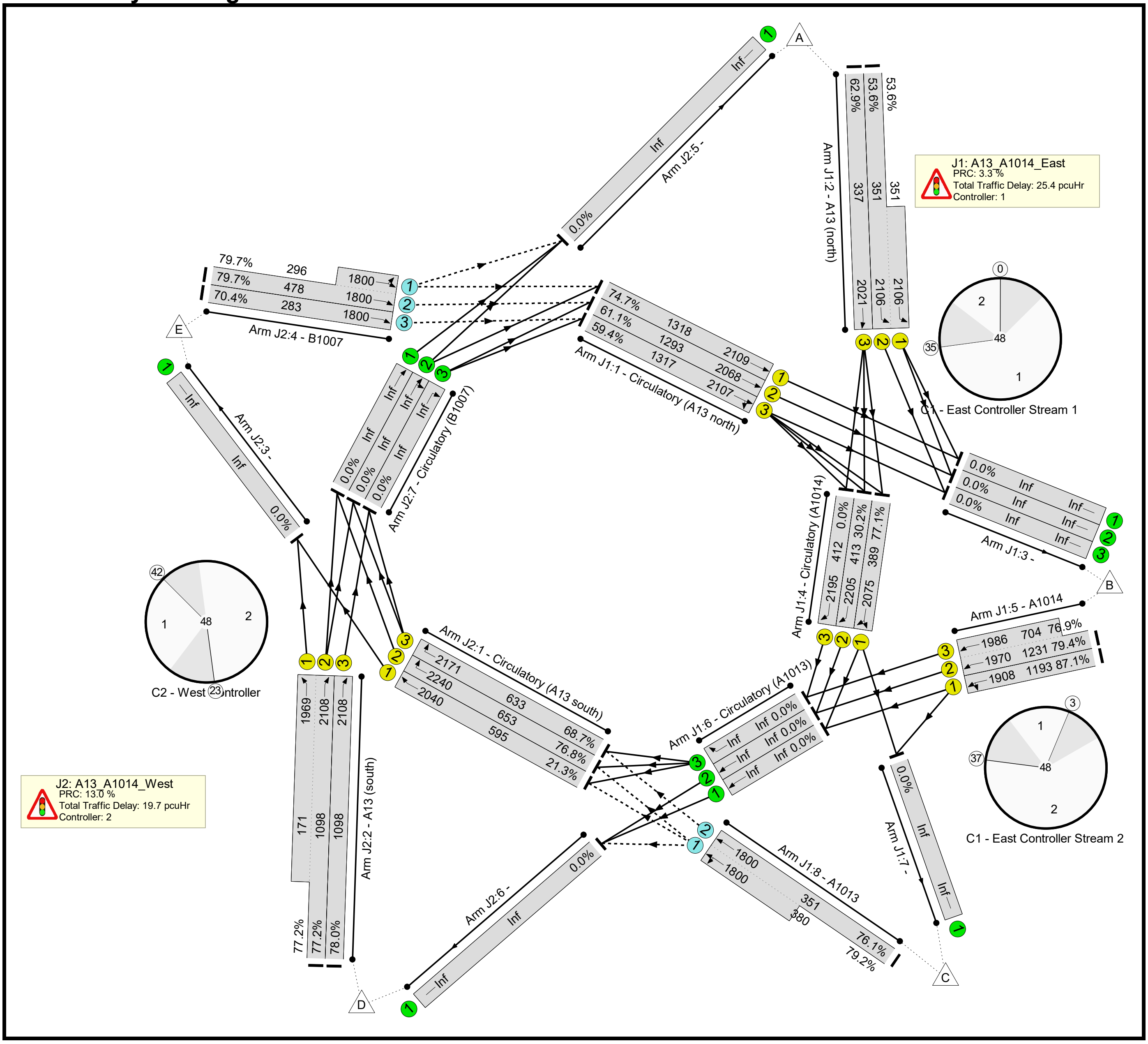
Actual Flow :

	Destination						
		A	B	C	D	E	Tot.
Origin	A	0	342	142	0	0	484
	B	1031	0	281	2400	0	3712
	C	144	60	0	32	75	311
	D	0	1986	10	0	139	2135
	E	56	244	23	61	0	384
	Tot.	1231	2632	456	2493	214	7026

Basic Results Summary

Scenario 12: 'PM Base + Com + Dev Scenario 2 (Demand)' (FG12: 'PM Base + Com + Dev Scenario 2 (Demand)', 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: A13/A1014	-	-	-		-	-	-	-	-	-	**87.1%**	**2569**	**0**	**0**	**45.1**	-	-
J1: A13_A1014_East	-	-	-		-	-	-	-	-	-	**87.1%**	**1136**	**0**	**0**	**25.4**	-	-
1/1	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	984	2109	1318	74.7%	-	-	-	1.7	6.2	6.8
1/2	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	790	2068	1293	61.1%	-	-	-	1.4	6.3	5.4
1/3	Circulatory (A13 north) Ahead Right	U	C1:A		1	29	-	782	2107	1317	59.4%	-	-	-	1.3	6.1	4.3
2/2+2/1	A13 (north) Left	U	C1:B		1	7	-	376	2106:2106	351+351	53.6 : 53.6%	-	-	-	2.5 (1.2+1.2)	23.8 (23.8:23.8)	2.8
2/3	A13 (north) Ahead	U	C1:B		1	7	-	212	2021	337	62.9%	-	-	-	1.9	32.9	3.4
4/1	Circulatory (A1014) Right Ahead	U	C1:C		1	8	-	300	2075	389	77.1%	-	-	-	2.4	28.9	3.4
4/2	Circulatory (A1014) Right	U	C1:C		1	8	-	125	2205	413	30.2%	-	-	-	1.0	27.8	1.9
4/3	Circulatory (A1014) Right	U	C1:C		1	8	-	0	2195	412	0.0%	-	-	-	0.0	0.0	0.0
5/1	A1014 Ahead Left	U	C1:D		1	29	-	1039	1908	1193	87.1%	-	-	-	5.4	18.7	14.5
5/2+5/3	A1014 Ahead	U	C1:D		1	29	-	1520	1970:1986	1231+704	79.4 : 76.9%	-	-	-	4.3 (3.0+1.3)	10.3 (11.0:8.9)	11.3
8/2+8/1	A1013 Ahead Left	O	-		-	-	-	568	1800:1800	351+380	76.1 : 79.2%	1136	0	0	3.5 (1.7+1.8)	21.9 (22.3:21.6)	5.1
J2: A13_A1014_West	-	-	-		-	-	-	-	-	-	**79.7%**	**1433**	**0**	**0**	**19.7**	-	-
1/1	Circulatory (A13 south) Ahead	U	C2:A		1	13	-	127	2040	595	21.3%	-	-	-	0.9	25.5	1.8

Basic Results Summary

1/2	Circulatory (A13 south) Right	U	C2:A		1	13	-	502	2240	653	76.8%	-	-	-	3.6	26.2	7.7
1/3	Circulatory (A13 south) Right	U	C2:A		1	13	-	435	2171	633	68.7%	-	-	-	3.4	28.3	6.6
2/2+2/1	A13 (south) Ahead Ahead2	U	C2:B		1	24	-	980	2108:1969	1098+171	77.2 : 77.2%	-	-	-	4.1 (3.6+0.4)	14.9 (15.4:12.1)	10.6
2/3	A13 (south) Ahead	U	C2:B		1	24	-	856	2108	1098	78.0%	-	-	-	4.0	16.6	10.8
4/2+4/1	B1007 Left Ahead	O	-		-	-	-	617	1800:1800	478+296	79.7 : 79.7%	1234	0	0	2.2 (1.4+0.8)	12.9 (13.2:12.3)	5.7
4/3	B1007 Ahead	O	-		-	-	-	199	1800	283	70.4%	199	0	0	1.5	27.3	2.6

C1 - East Controller	Stream: 1	PRC for Signalled Lanes (%):	20.6	Total Delay for Signalled Lanes (pcuHr):	8.82	Cycle Time (s):	48
C1 - East Controller	Stream: 2	PRC for Signalled Lanes (%):	3.3	Total Delay for Signalled Lanes (pcuHr):	13.09	Cycle Time (s):	48
C2 - West Controller		PRC for Signalled Lanes (%):	15.4	Total Delay for Signalled Lanes (pcuHr):	15.99	Cycle Time (s):	48
		PRC Over All Lanes (%):	3.3	Total Delay Over All Lanes(pcuHr):	45.07		

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E
A	0.0	28.8	66.8	0.0	0.0
B	51.8	0.0	23.7	24.4	0.0
C	70.3	91.0	0.0	26.6	57.1
D	0.0	35.7	79.2	0.0	17.1
E	17.3	30.1	92.3	83.9	0.0

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E
A	0.0	23.8	56.8	0.0	0.0
B	31.8	0.0	18.7	14.4	0.0
C	55.3	71.0	0.0	21.6	47.1
D	0.0	20.7	59.2	0.0	12.1
E	12.3	20.1	77.3	63.9	0.0

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 12: PM Base + Com + Dev Scenario 2 (Demand)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	17.10
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	83.87
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	17.26
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	52.39
12	D	J2:2/3	B	J1:3/2	35.67
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	29.96
17	D	J2:2/3	B	J1:3/3	35.32
18	E	J2:4/3	B	J1:3/3	46.10
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	28.66
22	A	J1:2/2	B	J1:3/2	28.81
23	C	J1:8/2	A	J2:5/1	70.66
24	B	J1:5/2	A	J2:5/1	50.43
27	C	J1:8/2	B	J1:3/2	90.91
28	A	J1:2/2	B	J1:3/1	28.81
30	A	J1:2/2	B	J1:3/3	28.81
31	D	J2:2/2	B	J1:3/1	36.00
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	30.40
34	B	J1:5/2	D	J2:6/1	21.00
35	D	J2:2/3	C	J1:7/1	79.24
36	E	J2:4/3	C	J1:7/1	92.33
37	A	J1:2/3	C	J1:7/1	66.78
38	B	J1:5/1	C	J1:7/1	23.66
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	69.85
43	C	J1:8/2	C	J1:7/1	-

Basic Results Summary

44	C	J1:8/2	B	J1:3/3	90.83
45	C	J1:8/2	B	J1:3/1	91.58
46	C	J1:8/2	E	J2:3/1	57.07
47	C	J1:8/2	D	J2:6/1	26.59

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 12: PM Base + Com + Dev Scenario 2 (Demand)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	12.10
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	63.87
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	12.26
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	32.39
12	D	J2:2/3	B	J1:3/2	20.67
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	19.96
17	D	J2:2/3	B	J1:3/3	20.32
18	E	J2:4/3	B	J1:3/3	36.10
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	18.66
22	A	J1:2/2	B	J1:3/2	23.81
23	C	J1:8/2	A	J2:5/1	55.66
24	B	J1:5/2	A	J2:5/1	30.43
27	C	J1:8/2	B	J1:3/2	70.91
28	A	J1:2/2	B	J1:3/1	23.81
30	A	J1:2/2	B	J1:3/3	23.81
31	D	J2:2/2	B	J1:3/1	21.00
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	20.40
34	B	J1:5/2	D	J2:6/1	11.00
35	D	J2:2/3	C	J1:7/1	59.24
36	E	J2:4/3	C	J1:7/1	77.33
37	A	J1:2/3	C	J1:7/1	56.78
38	B	J1:5/1	C	J1:7/1	18.66
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	54.85
43	C	J1:8/2	C	J1:7/1	-

Basic Results Summary

44	C	J1:8/2	B	J1:3/3	70.83
45	C	J1:8/2	B	J1:3/1	71.58
46	C	J1:8/2	E	J2:3/1	47.07
47	C	J1:8/2	D	J2:6/1	21.59

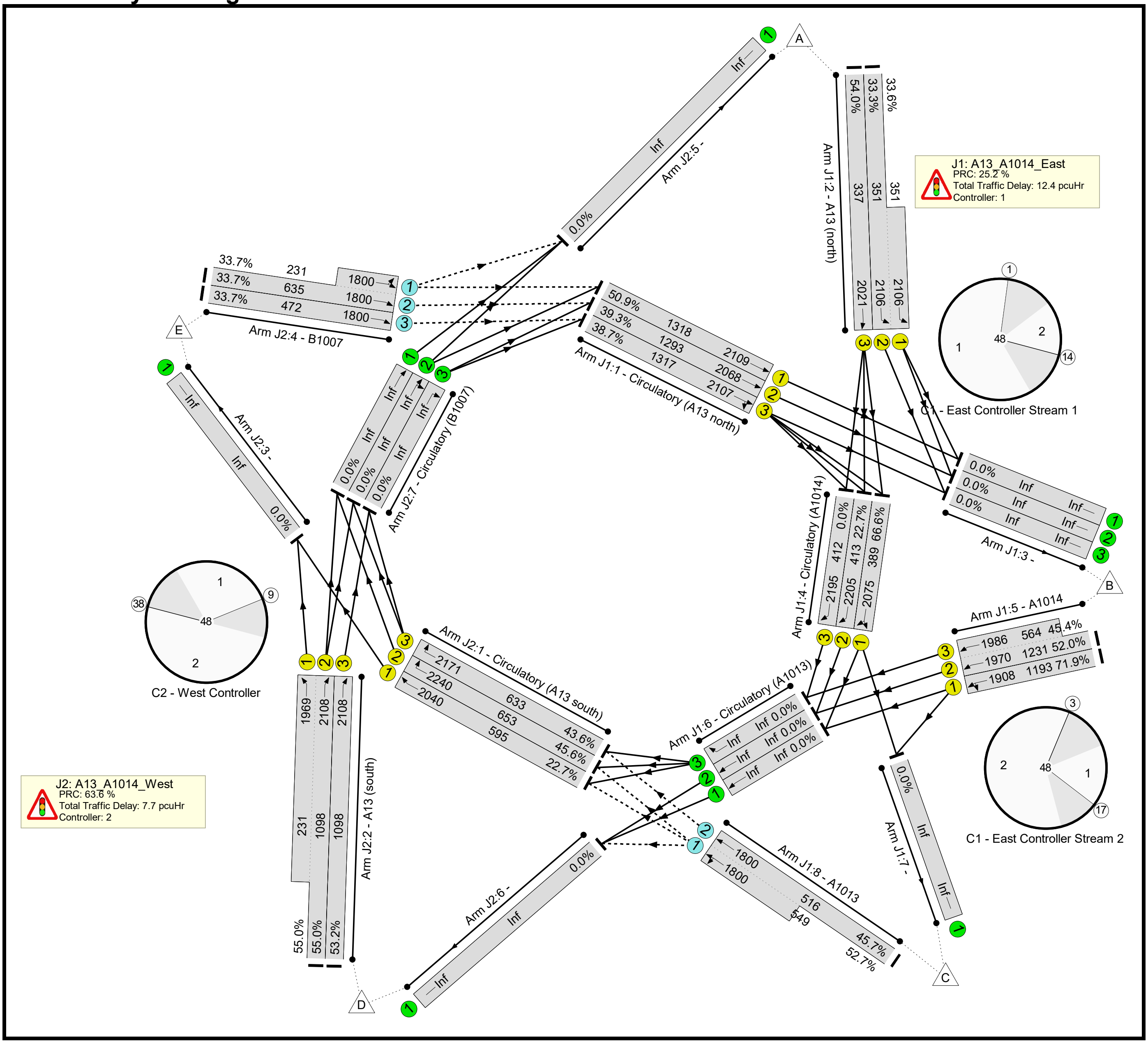
Traffic Flows, Actual

Actual Flow :

		Destination					
		A	B	C	D	E	Tot.
Origin	A	0	376	212	0	0	588
	B	542	0	250	1767	0	2559
	C	236	159	0	46	127	568
	D	0	1689	15	0	132	1836
	E	123	495	73	125	0	816
	Tot.	901	2719	550	1938	259	6367

Scenario 13: 'AM Base + Com (VISUM)' (FG13: 'AM Base + Com (VISUM)', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

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: A13/A1014	-	-	-		-	-	-	-	-	-	**71.9%**	**1793**	**0**	**0**	**20.1**	-	-
J1: A13_A1014_East	-	-	-		-	-	-	-	-	-	**71.9%**	**1050**	**0**	**0**	**12.4**	-	-
1/1	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	671	2109	1318	50.9%	-	-	-	0.7	3.5	1.1
1/2	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	508	2068	1293	39.3%	-	-	-	0.7	4.9	2.2
1/3	Circulatory (A13 north) Ahead Right	U	C1:A		1	29	-	509	2107	1317	38.7%	-	-	-	0.5	3.8	1.5
2/2+2/1	A13 (north) Left	U	C1:B		1	7	-	235	2106:2106	351+351	33.3 : 33.6%	-	-	-	1.4 (0.7+0.7)	21.5 (21.5:21.5)	1.6
2/3	A13 (north) Ahead	U	C1:B		1	7	-	182	2021	337	54.0%	-	-	-	1.5	29.9	2.8
4/1	Circulatory (A1014) Right Ahead	U	C1:C		1	8	-	259	2075	389	66.6%	-	-	-	1.6	22.7	2.2
4/2	Circulatory (A1014) Right	U	C1:C		1	8	-	94	2205	413	22.7%	-	-	-	0.7	27.2	1.4
4/3	Circulatory (A1014) Right	U	C1:C		1	8	-	0	2195	412	0.0%	-	-	-	0.0	0.0	0.0
5/1	A1014 Ahead Left	U	C1:D		1	29	-	857	1908	1193	71.9%	-	-	-	2.7	11.5	8.9
5/2+5/3	A1014 Ahead	U	C1:D		1	29	-	896	1970:1986	1231+564	52.0 : 45.4%	-	-	-	1.7 (1.2+0.4)	6.7 (7.0:5.9)	5.1
8/2+8/1	A1013 Ahead Left	O	-		-	-	-	525	1800:1800	516+549	45.7 : 52.7%	1050	0	0	0.9 (0.4+0.5)	6.0 (6.0:6.0)	2.3
J2: A13_A1014_West	-	-	-		-	-	-	-	-	-	**55.0%**	**743**	**0**	**0**	**7.7**	-	-
1/1	Circulatory (A13 south) Ahead	U	C2:A		1	13	-	135	2040	595	22.7%	-	-	-	0.6	15.9	1.2

Basic Results Summary

1/2	Circulatory (A13 south) Right	U	C2:A		1	13	-	298	2240	653	45.6%	-	-	-	1.3	15.8	3.4
1/3	Circulatory (A13 south) Right	U	C2:A		1	13	-	276	2171	633	43.6%	-	-	-	1.3	17.0	2.7
2/2+2/1	A13 (south) Ahead Ahead2	U	C2:B		1	24	-	731	2108:1969	1098+231	55.0 : 55.0%	-	-	-	2.1 (1.8+0.3)	10.4 (10.7:8.9)	6.0
2/3	A13 (south) Ahead	U	C2:B		1	24	-	584	2108	1098	53.2%	-	-	-	1.8	11.1	5.6
4/2+4/1	B1007 Left Ahead	O	-		-	-	-	292	1800:1800	635+231	33.7 : 33.7%	584	0	0	0.3 (0.2+0.1)	3.3 (3.4:3.3)	0.6
4/3	B1007 Ahead	O	-		-	-	-	159	1800	472	33.7%	159	0	0	0.3	7.3	0.8

C1 - East Controller	Stream: 1	PRC for Signalled Lanes (%):	66.6	Total Delay for Signalled Lanes (pcuHr):	4.81	Cycle Time (s):	48
C1 - East Controller	Stream: 2	PRC for Signalled Lanes (%):	25.2	Total Delay for Signalled Lanes (pcuHr):	6.73	Cycle Time (s):	48
C2 - West Controller		PRC for Signalled Lanes (%):	63.6	Total Delay for Signalled Lanes (pcuHr):	7.13	Cycle Time (s):	48
		PRC Over All Lanes (%):	25.2	Total Delay Over All Lanes(pcuHr):	20.14		

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E
A	0.0	26.5	57.3	0.0	0.0
B	41.0	0.0	16.5	19.1	0.0
C	38.3	55.6	0.0	11.0	31.9
D	0.0	28.8	67.6	0.0	13.9
E	8.3	19.5	63.4	60.2	0.0

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E
A	0.0	21.5	47.3	0.0	0.0
B	21.0	0.0	11.5	9.1	0.0
C	23.3	35.6	0.0	6.0	21.9
D	0.0	13.8	47.6	0.0	8.9
E	3.3	9.5	48.4	40.2	0.0

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 13: AM Base + Com (VISUM)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	13.93
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	60.24
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	8.26
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	41.03
12	D	J2:2/3	B	J1:3/2	28.73
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	19.49
17	D	J2:2/3	B	J1:3/3	28.65
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	21.45
22	A	J1:2/2	B	J1:3/2	26.55
23	C	J1:8/2	A	J2:5/1	38.38
24	B	J1:5/2	A	J2:5/1	41.07
27	C	J1:8/2	B	J1:3/2	55.81
28	A	J1:2/2	B	J1:3/1	26.55
30	A	J1:2/2	B	J1:3/3	26.54
31	D	J2:2/2	B	J1:3/1	28.81
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	19.51
34	B	J1:5/2	D	J2:6/1	17.00
35	D	J2:2/3	C	J1:7/1	67.61
36	E	J2:4/3	C	J1:7/1	63.45
37	A	J1:2/3	C	J1:7/1	57.25
38	B	J1:5/1	C	J1:7/1	16.45
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	38.29
43	C	J1:8/2	C	J1:7/1	-

Basic Results Summary

44	C	J1:8/2	B	J1:3/3	55.13
45	C	J1:8/2	B	J1:3/1	55.39
46	C	J1:8/2	E	J2:3/1	31.93
47	C	J1:8/2	D	J2:6/1	10.99

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 13: AM Base + Com (VISUM)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	8.93
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	40.24
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	3.26
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	21.03
12	D	J2:2/3	B	J1:3/2	13.73
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	9.49
17	D	J2:2/3	B	J1:3/3	13.65
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	11.45
22	A	J1:2/2	B	J1:3/2	21.55
23	C	J1:8/2	A	J2:5/1	23.38
24	B	J1:5/2	A	J2:5/1	21.07
27	C	J1:8/2	B	J1:3/2	35.81
28	A	J1:2/2	B	J1:3/1	21.55
30	A	J1:2/2	B	J1:3/3	21.54
31	D	J2:2/2	B	J1:3/1	13.81
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	9.51
34	B	J1:5/2	D	J2:6/1	7.00
35	D	J2:2/3	C	J1:7/1	47.61
36	E	J2:4/3	C	J1:7/1	48.45
37	A	J1:2/3	C	J1:7/1	47.25
38	B	J1:5/1	C	J1:7/1	11.45
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	23.29
43	C	J1:8/2	C	J1:7/1	-

Basic Results Summary

44	C	J1:8/2	B	J1:3/3	35.13
45	C	J1:8/2	B	J1:3/1	35.39
46	C	J1:8/2	E	J2:3/1	21.93
47	C	J1:8/2	D	J2:6/1	5.99

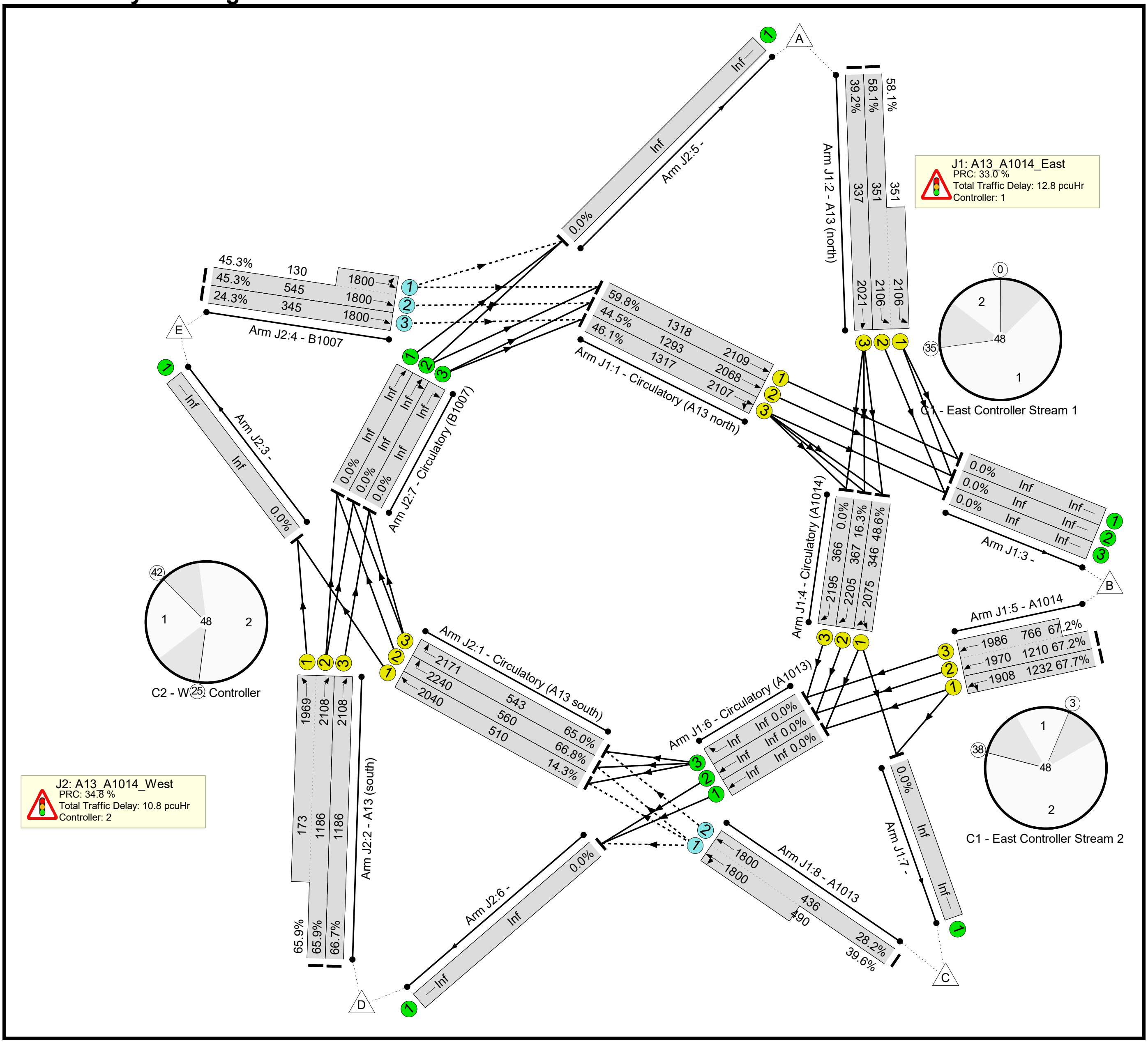
Traffic Flows, Actual

Actual Flow :

		Destination					
		A	B	C	D	E	Tot.
Origin	A	0	235	182	0	0	417
	B	256	0	286	1211	0	1753
	C	243	75	0	72	135	525
	D	0	1176	12	0	127	1315
	E	26	266	65	94	0	451
	Tot.	525	1752	545	1377	262	4461

Scenario 14: 'I/P Base + Com (VISUM)' (FG14: 'I/P Base + Com (VISUM)', 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: A13/A1014	-	-	-		-	-	-	-	-	-	**67.7%**	**1330**	**0**	**0**	**23.7**	-	-
J1: A13_A1014_East	-	-	-		-	-	-	-	-	-	**67.7%**	**634**	**0**	**0**	**12.8**	-	-
1/1	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	788	2109	1318	59.8%	-	-	-	0.9	3.9	1.1
1/2	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	575	2068	1293	44.5%	-	-	-	0.7	4.5	2.3
1/3	Circulatory (A13 north) Ahead Right	U	C1:A		1	29	-	607	2107	1317	46.1%	-	-	-	0.7	4.0	1.7
2/2+2/1	A13 (north) Left	U	C1:B		1	7	-	408	2106:2106	351+351	58.1 : 58.1%	-	-	-	2.8 (1.4+1.4)	24.6 (24.6:24.6)	3.2
2/3	A13 (north) Ahead	U	C1:B		1	7	-	132	2021	337	39.2%	-	-	-	1.0	26.6	1.9
4/1	Circulatory (A1014) Right Ahead	U	C1:C		1	7	-	168	2075	346	48.6%	-	-	-	0.8	17.1	1.1
4/2	Circulatory (A1014) Right	U	C1:C		1	7	-	60	2205	367	16.3%	-	-	-	0.5	27.3	0.9
4/3	Circulatory (A1014) Right	U	C1:C		1	7	-	0	2195	366	0.0%	-	-	-	0.0	0.0	0.0
5/1	A1014 Ahead Left	U	C1:D		1	30	-	834	1908	1232	67.7%	-	-	-	2.3	9.8	8.0
5/2+5/3	A1014 Ahead	U	C1:D		1	30	-	1328	1970:1986	1210+766	67.2 : 67.2%	-	-	-	2.8 (1.8+1.0)	7.5 (7.9:6.8)	7.3
8/2+8/1	A1013 Ahead Left	O	-		-	-	-	317	1800:1800	436+490	28.2 : 39.6%	634	0	0	0.5 (0.2+0.3)	6.1 (6.1:6.1)	1.5
J2: A13_A1014_West	-	-	-		-	-	-	-	-	-	**66.8%**	**696**	**0**	**0**	**10.8**	-	-
1/1	Circulatory (A13 south) Ahead	U	C2:A		1	11	-	73	2040	510	14.3%	-	-	-	0.4	17.5	0.6

Basic Results Summary

1/2	Circulatory (A13 south) Right	U	C2:A		1	11	-	374	2240	560	66.8%	-	-	-	2.3	22.3	5.2
1/3	Circulatory (A13 south) Right	U	C2:A		1	11	-	353	2171	543	65.0%	-	-	-	2.2	22.2	4.8
2/2+2/1	A13 (south) Ahead Ahead2	U	C2:B		1	26	-	895	2108:1969	1186+173	65.9 : 65.9%	-	-	-	2.7 (2.4+0.3)	10.9 (11.2:8.8)	8.1
2/3	A13 (south) Ahead	U	C2:B		1	26	-	791	2108	1186	66.7%	-	-	-	2.6	11.9	8.2
4/2+4/1	B1007 Left Ahead	O	-		-	-	-	306	1800:1800	545+130	45.3 : 45.3%	612	0	0	0.5 (0.4+0.1)	5.5 (5.6:5.2)	1.2
4/3	B1007 Ahead	O	-		-	-	-	84	1800	345	24.3%	84	0	0	0.2	9.5	0.5

C1 - East Controller Stream: 1 PRC for Signalled Lanes (%): 50.5 Total Delay for Signalled Lanes (pcuHr): 6.00 Cycle Time (s): 48
C1 - East Controller Stream: 2 PRC for Signalled Lanes (%): 33.0 Total Delay for Signalled Lanes (pcuHr): 6.29 Cycle Time (s): 48
C2 - West Controller PRC for Signalled Lanes (%): 34.8 Total Delay for Signalled Lanes (pcuHr): 10.16 Cycle Time (s): 48
PRC Over All Lanes (%): 33.0 Total Delay Over All Lanes(pcuHr): 23.68

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E
A	0.0	29.6	49.9	0.0	0.0
B	48.5	0.0	14.8	18.8	0.0
C	44.7	61.1	0.0	11.1	33.6
D	0.0	29.9	64.9	0.0	13.8
E	10.2	21.4	61.7	62.6	0.0

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E
A	0.0	24.6	39.9	0.0	0.0
B	28.5	0.0	9.8	8.8	0.0
C	29.7	41.1	0.0	6.1	23.6
D	0.0	14.9	44.9	0.0	8.8
E	5.2	11.4	46.7	42.6	0.0

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 14: I/P Base + Com (VISUM)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	13.78
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	62.63
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	10.23
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	48.62
12	D	J2:2/3	B	J1:3/2	29.89
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	21.40
17	D	J2:2/3	B	J1:3/3	29.89
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	19.85
22	A	J1:2/2	B	J1:3/2	29.57
23	C	J1:8/2	A	J2:5/1	44.97
24	B	J1:5/2	A	J2:5/1	48.38
27	C	J1:8/2	B	J1:3/2	61.24
28	A	J1:2/2	B	J1:3/1	29.57
30	A	J1:2/2	B	J1:3/3	29.57
31	D	J2:2/2	B	J1:3/1	30.01
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	21.82
34	B	J1:5/2	D	J2:6/1	17.89
35	D	J2:2/3	C	J1:7/1	64.89
36	E	J2:4/3	C	J1:7/1	61.73
37	A	J1:2/3	C	J1:7/1	49.92
38	B	J1:5/1	C	J1:7/1	14.85
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	44.40
43	C	J1:8/2	C	J1:7/1	-

Basic Results Summary

44	C	J1:8/2	B	J1:3/3	60.99
45	C	J1:8/2	B	J1:3/1	61.27
46	C	J1:8/2	E	J2:3/1	33.61
47	C	J1:8/2	D	J2:6/1	11.08

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 14: I/P Base + Com (VISUM)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	8.78
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	42.63
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	5.23
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	28.62
12	D	J2:2/3	B	J1:3/2	14.89
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	11.40
17	D	J2:2/3	B	J1:3/3	14.89
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	9.85
22	A	J1:2/2	B	J1:3/2	24.57
23	C	J1:8/2	A	J2:5/1	29.97
24	B	J1:5/2	A	J2:5/1	28.38
27	C	J1:8/2	B	J1:3/2	41.24
28	A	J1:2/2	B	J1:3/1	24.57
30	A	J1:2/2	B	J1:3/3	24.57
31	D	J2:2/2	B	J1:3/1	15.01
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	11.82
34	B	J1:5/2	D	J2:6/1	7.89
35	D	J2:2/3	C	J1:7/1	44.89
36	E	J2:4/3	C	J1:7/1	46.73
37	A	J1:2/3	C	J1:7/1	39.92
38	B	J1:5/1	C	J1:7/1	9.85
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	29.40
43	C	J1:8/2	C	J1:7/1	-

Basic Results Summary

44	C	J1:8/2	B	J1:3/3	40.99
45	C	J1:8/2	B	J1:3/1	41.27
46	C	J1:8/2	E	J2:3/1	23.61
47	C	J1:8/2	D	J2:6/1	6.08

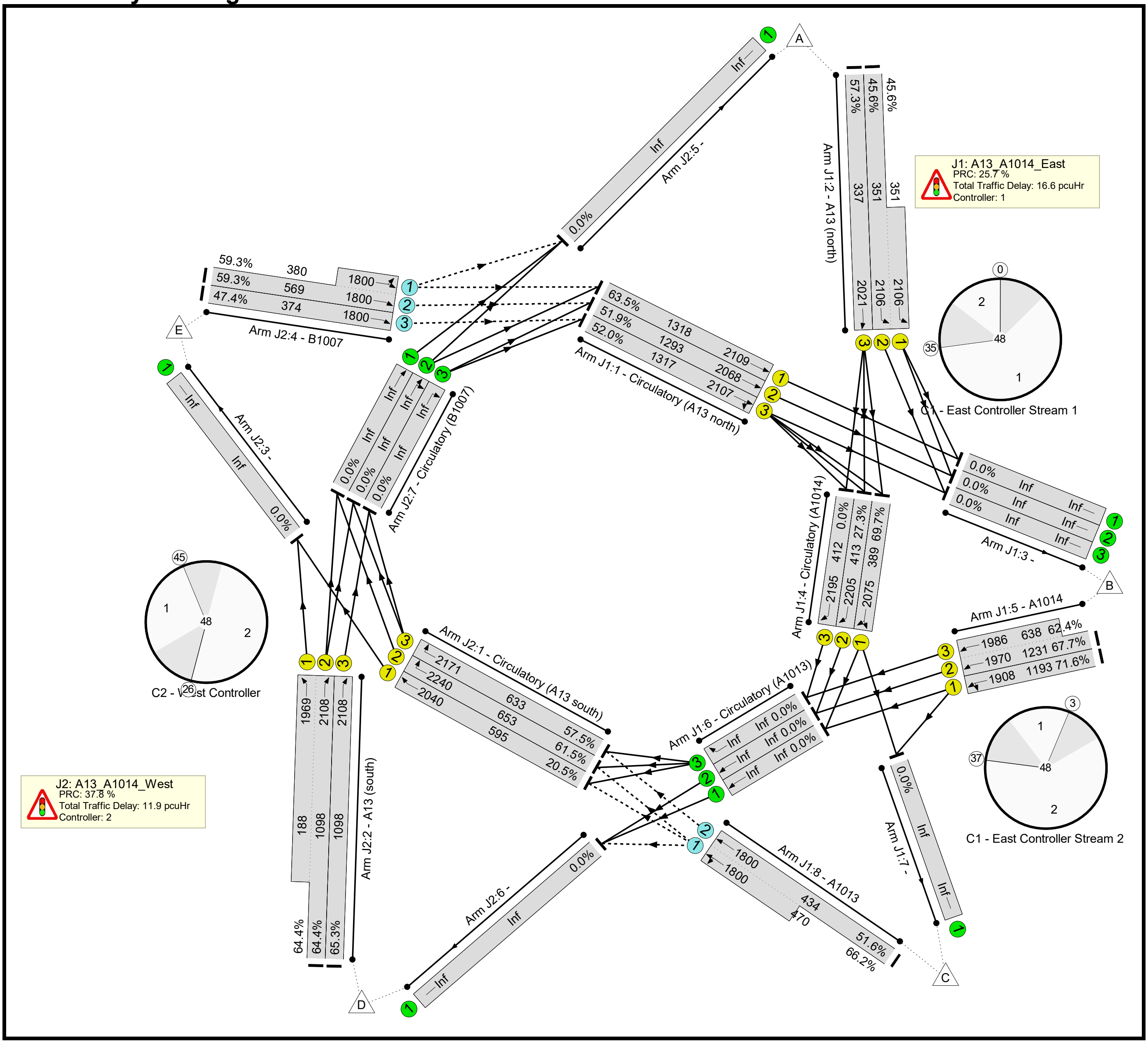
Traffic Flows, Actual

Actual Flow :

		Destination					
		A	B	C	D	E	Tot.
Origin	A	0	408	132	0	0	540
	B	515	0	193	1454	0	2162
	C	149	63	0	32	73	317
	D	0	1560	12	0	114	1686
	E	55	251	24	60	0	390
	Tot.	719	2282	361	1546	187	5095

Scenario 15: 'PM Base + Com (VISUM)' (FG15: 'PM Base + Com (VISUM)', 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: A13/A1014	-	-	-		-	-	-	-	-	-	**71.6%**	**2371**	**0**	**0**	**28.4**	-	-
J1: A13_A1014_East	-	-	-		-	-	-	-	-	-	**71.6%**	**1070**	**0**	**0**	**16.6**	-	-
1/1	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	837	2109	1318	63.5%	-	-	-	1.1	4.9	3.3
1/2	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	671	2068	1293	51.9%	-	-	-	1.1	5.7	3.5
1/3	Circulatory (A13 north) Ahead Right	U	C1:A		1	29	-	685	2107	1317	52.0%	-	-	-	1.0	5.3	2.9
2/2+2/1	A13 (north) Left	U	C1:B		1	7	-	320	2106:2106	351+351	45.6 : 45.6%	-	-	-	2.0 (1.0+1.0)	22.8 (22.8:22.8)	2.3
2/3	A13 (north) Ahead	U	C1:B		1	7	-	193	2021	337	57.3%	-	-	-	1.7	30.8	3.0
4/1	Circulatory (A1014) Right Ahead	U	C1:C		1	8	-	271	2075	389	69.7%	-	-	-	1.8	23.6	2.4
4/2	Circulatory (A1014) Right	U	C1:C		1	8	-	113	2205	413	27.3%	-	-	-	0.8	26.4	1.7
4/3	Circulatory (A1014) Right	U	C1:C		1	8	-	0	2195	412	0.0%	-	-	-	0.0	0.0	0.0
5/1	A1014 Ahead Left	U	C1:D		1	29	-	854	1908	1193	71.6%	-	-	-	2.7	11.4	8.8
5/2+5/3	A1014 Ahead	U	C1:D		1	29	-	1232	1970:1986	1231+638	67.7 : 62.4%	-	-	-	2.8 (2.0+0.8)	8.1 (8.7:7.0)	8.1
8/2+8/1	A1013 Ahead Left	O	-		-	-	-	535	1800:1800	434+470	51.6 : 66.2%	1070	0	0	1.6 (0.6+0.9)	10.6 (10.4:10.8)	3.6
J2: A13_A1014_West	-	-	-		-	-	-	-	-	-	**65.3%**	**1301**	**0**	**0**	**11.9**	-	-
1/1	Circulatory (A13 south) Ahead	U	C2:A		1	13	-	122	2040	595	20.5%	-	-	-	0.7	20.7	1.2

Basic Results Summary

1/2	Circulatory (A13 south) Right	U	C2:A		1	13	-	402	2240	653	61.5%	-	-	-	2.3	20.4	5.2
1/3	Circulatory (A13 south) Right	U	C2:A		1	13	-	364	2171	633	57.5%	-	-	-	2.1	21.2	4.4
2/2+2/1	A13 (south) Ahead Ahead2	U	C2:B		1	24	-	828	2108:1969	1098+188	64.4 : 64.4%	-	-	-	2.7 (2.4+0.3)	11.9 (12.2:9.8)	7.6
2/3	A13 (south) Ahead	U	C2:B		1	24	-	717	2108	1098	65.3%	-	-	-	2.6	13.1	7.7
4/2+4/1	B1007 Left Ahead	O	-		-	-	-	562	1800:1800	569+380	59.3 : 59.3%	1124	0	0	0.8 (0.5+0.3)	5.3 (5.4:5.1)	1.9
4/3	B1007 Ahead	O	-		-	-	-	177	1800	374	47.4%	177	0	0	0.6	12.3	1.4

C1 - East Controller Stream: 1 PRC for Signalled Lanes (%): 41.7 Total Delay for Signalled Lanes (pcuHr): 6.88 Cycle Time (s): 48
C1 - East Controller Stream: 2 PRC for Signalled Lanes (%): 25.7 Total Delay for Signalled Lanes (pcuHr): 8.09 Cycle Time (s): 48
C2 - West Controller PRC for Signalled Lanes (%): 37.8 Total Delay for Signalled Lanes (pcuHr): 10.46 Cycle Time (s): 48
PRC Over All Lanes (%): 25.7 Total Delay Over All Lanes(pcuHr): 28.44

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E
A	0.0	27.8	59.8	0.0	0.0
B	45.0	0.0	16.4	19.9	0.0
C	49.8	65.8	0.0	15.8	41.5
D	0.0	31.6	69.8	0.0	14.8
E	10.1	22.1	69.2	65.2	0.0

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E
A	0.0	22.8	49.8	0.0	0.0
B	25.0	0.0	11.4	9.9	0.0
C	34.8	45.8	0.0	10.8	31.5
D	0.0	16.6	49.8	0.0	9.8
E	5.1	12.1	54.2	45.2	0.0

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 15: PM Base + Com (VISUM)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	14.83
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	65.23
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	10.10
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	45.12
12	D	J2:2/3	B	J1:3/2	31.62
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	22.00
17	D	J2:2/3	B	J1:3/3	31.57
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	21.39
22	A	J1:2/2	B	J1:3/2	27.76
23	C	J1:8/2	A	J2:5/1	50.35
24	B	J1:5/2	A	J2:5/1	44.66
27	C	J1:8/2	B	J1:3/2	65.97
28	A	J1:2/2	B	J1:3/1	27.76
30	A	J1:2/2	B	J1:3/3	27.76
31	D	J2:2/2	B	J1:3/1	31.62
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	22.25
34	B	J1:5/2	D	J2:6/1	18.67
35	D	J2:2/3	C	J1:7/1	69.85
36	E	J2:4/3	C	J1:7/1	69.25
37	A	J1:2/3	C	J1:7/1	59.81
38	B	J1:5/1	C	J1:7/1	16.39
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	48.89
43	C	J1:8/2	C	J1:7/1	-

44	C	J1:8/2	B	J1:3/3	65.68
45	C	J1:8/2	B	J1:3/1	65.94
46	C	J1:8/2	E	J2:3/1	41.50
47	C	J1:8/2	D	J2:6/1	15.81

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 15: PM Base + Com (VISUM)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	9.83
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	45.23
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	5.10
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	25.12
12	D	J2:2/3	B	J1:3/2	16.62
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	12.00
17	D	J2:2/3	B	J1:3/3	16.57
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	11.39
22	A	J1:2/2	B	J1:3/2	22.76
23	C	J1:8/2	A	J2:5/1	35.35
24	B	J1:5/2	A	J2:5/1	24.66
27	C	J1:8/2	B	J1:3/2	45.97
28	A	J1:2/2	B	J1:3/1	22.76
30	A	J1:2/2	B	J1:3/3	22.76
31	D	J2:2/2	B	J1:3/1	16.62
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	12.25
34	B	J1:5/2	D	J2:6/1	8.67
35	D	J2:2/3	C	J1:7/1	49.85
36	E	J2:4/3	C	J1:7/1	54.25
37	A	J1:2/3	C	J1:7/1	49.81
38	B	J1:5/1	C	J1:7/1	11.39
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	33.89
43	C	J1:8/2	C	J1:7/1	-

Basic Results Summary

44	C	J1:8/2	B	J1:3/3	45.68
45	C	J1:8/2	B	J1:3/1	45.94
46	C	J1:8/2	E	J2:3/1	31.50
47	C	J1:8/2	D	J2:6/1	10.81

Traffic Flows, Actual

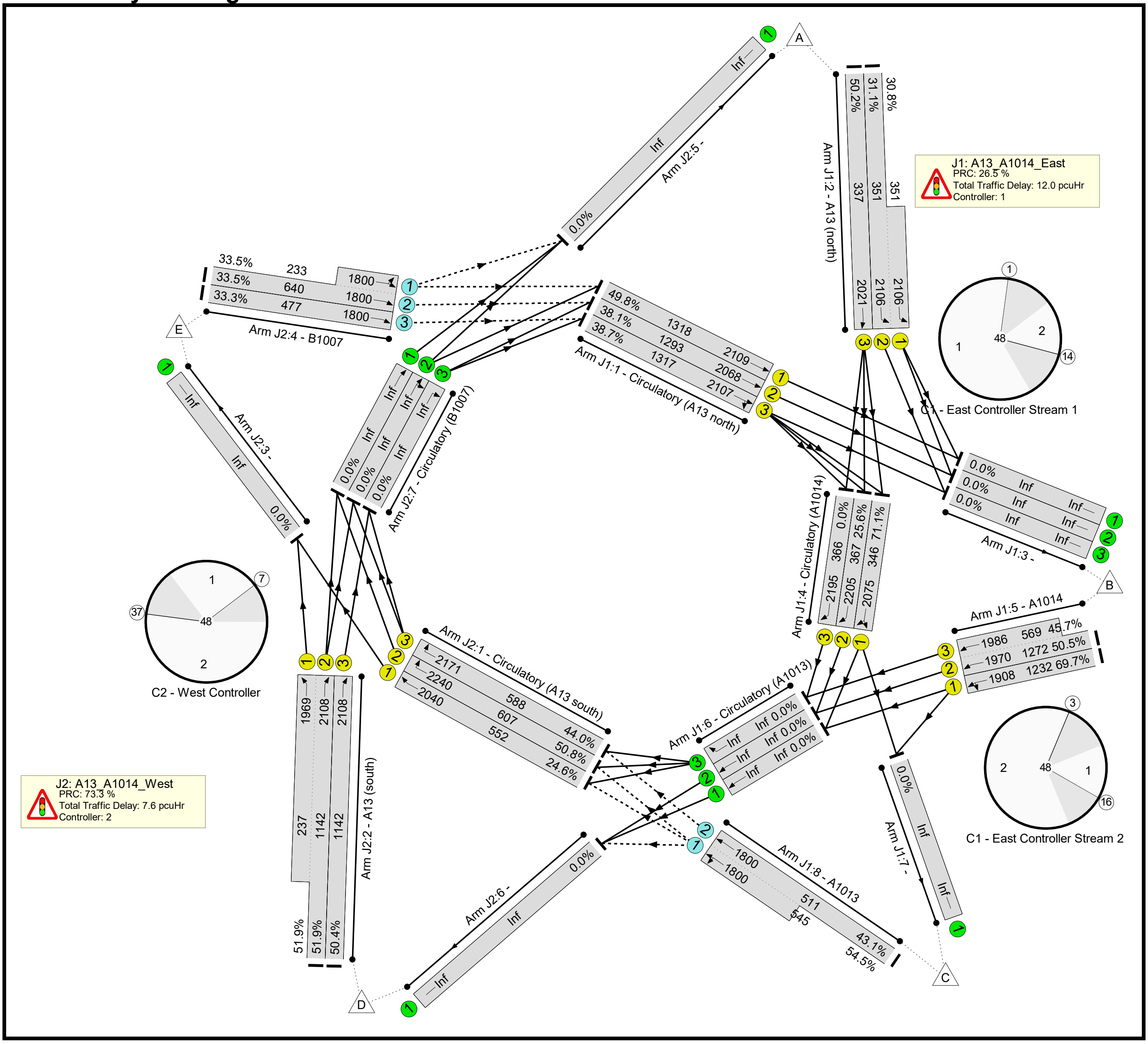
Actual Flow :

	Destination						
Origin		A	B	C	D	E	Tot.
	A	0	320	193	0	0	513
	B	398	0	216	1472	0	2086
	C	226	142	0	45	122	535
	D	0	1410	14	0	121	1545
	E	112	450	64	113	0	739
	Tot.	736	2322	487	1630	243	5418

Basic Results Summary

Scenario 16: 'AM Base + Com + Dev (VISUM)' (FG16: 'AM Base + Com + Dev (VISUM)', 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: A13/A1014	-	-	-		-	-	-	-	-	-	**71.1%**	**1777**	**0**	**0**	**19.5**	-	-
J1: A13_A1014_East	-	-	-		-	-	-	-	-	-	**71.1%**	**1034**	**0**	**0**	**12.0**	-	-
1/1	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	657	2109	1318	49.8%	-	-	-	0.6	3.4	1.1
1/2	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	492	2068	1293	38.1%	-	-	-	0.6	4.5	2.2
1/3	Circulatory (A13 north) Ahead Right	U	C1:A		1	29	-	510	2107	1317	38.7%	-	-	-	0.6	4.2	1.8
2/2+2/1	A13 (north) Left	U	C1:B		1	7	-	217	2106:2106	351+351	31.1 : 30.8%	-	-	-	1.3 (0.6+0.6)	21.3 (21.3:21.3)	1.5
2/3	A13 (north) Ahead	U	C1:B		1	7	-	169	2021	337	50.2%	-	-	-	1.4	28.9	2.5
4/1	Circulatory (A1014) Right Ahead	U	C1:C		1	7	-	246	2075	346	71.1%	-	-	-	1.9	28.5	2.6
4/2	Circulatory (A1014) Right	U	C1:C		1	7	-	94	2205	367	25.6%	-	-	-	0.7	28.2	1.4
4/3	Circulatory (A1014) Right	U	C1:C		1	7	-	0	2195	366	0.0%	-	-	-	0.0	0.0	0.0
5/1	A1014 Ahead Left	U	C1:D		1	30	-	859	1908	1232	69.7%	-	-	-	2.5	10.3	8.3
5/2+5/3	A1014 Ahead	U	C1:D		1	30	-	902	1970:1986	1272+569	50.5 : 45.7%	-	-	-	1.5 (1.1+0.4)	6.1 (6.4:5.4)	4.9
8/2+8/1	A1013 Ahead Left	O	-		-	-	-	517	1800:1800	511+545	43.1 : 54.5%	1034	0	0	0.8 (0.3+0.5)	5.8 (5.6:5.9)	2.4
J2: A13_A1014_West	-	-	-		-	-	-	-	-	-	**51.9%**	**743**	**0**	**0**	**7.6**	-	-
1/1	Circulatory (A13 south) Ahead	U	C2:A		1	12	-	136	2040	552	24.6%	-	-	-	0.7	17.3	1.2

Basic Results Summary

1/2	Circulatory (A13 south) Right	U	C2:A		1	12	-	308	2240	607	50.8%	-	-	-	1.5	18.0	3.8
1/3	Circulatory (A13 south) Right	U	C2:A		1	12	-	259	2171	588	44.0%	-	-	-	1.3	18.2	2.6
2/2+2/1	A13 (south) Ahead Ahead2	U	C2:B		1	25	-	716	2108:1969	1142+237	51.9 : 51.9%	-	-	-	1.9 (1.6+0.3)	9.5 (9.7:8.1)	5.5
2/3	A13 (south) Ahead	U	C2:B		1	25	-	575	2108	1142	50.4%	-	-	-	1.6	10.1	5.3
4/2+4/1	B1007 Left Ahead	O	-		-	-	-	292	1800:1800	640+233	33.5 : 33.5%	584	0	0	0.3 (0.2+0.1)	3.3 (3.4:3.2)	0.7
4/3	B1007 Ahead	O	-		-	-	-	159	1800	477	33.3%	159	0	0	0.3	7.1	0.8

C1 - East Controller Stream: 1 PRC for Signalled Lanes (%): 79.4 Total Delay for Signalled Lanes (pcuHr): 4.47 Cycle Time (s): 48
C1 - East Controller Stream: 2 PRC for Signalled Lanes (%): 26.5 Total Delay for Signalled Lanes (pcuHr): 6.66 Cycle Time (s): 48
C2 - West Controller PRC for Signalled Lanes (%): 73.3 Total Delay for Signalled Lanes (pcuHr): 7.00 Cycle Time (s): 48
PRC Over All Lanes (%): 26.5 Total Delay Over All Lanes(pcuHr): 19.54

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E
A	0.0	26.3	62.3	0.0	0.0
B	42.7	0.0	15.3	18.2	0.0
C	39.5	57.5	0.0	10.9	33.2
D	0.0	27.6	72.0	0.0	13.1
E	8.2	19.3	67.5	61.1	0.0

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E
A	0.0	21.3	52.3	0.0	0.0
B	22.7	0.0	10.3	8.2	0.0
C	24.5	37.5	0.0	5.9	23.2
D	0.0	12.6	52.0	0.0	8.1
E	3.2	9.3	52.5	41.1	0.0

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 16: AM Base + Com + Dev (VISUM)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	13.13
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	61.09
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	8.24
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	42.79
12	D	J2:2/3	B	J1:3/2	27.64
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	19.32
17	D	J2:2/3	B	J1:3/3	27.59
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	20.27
22	A	J1:2/2	B	J1:3/2	26.30
23	C	J1:8/2	A	J2:5/1	40.39
24	B	J1:5/2	A	J2:5/1	42.04
27	C	J1:8/2	B	J1:3/2	57.51
28	A	J1:2/2	B	J1:3/1	26.30
30	A	J1:2/2	B	J1:3/3	26.31
31	D	J2:2/2	B	J1:3/1	27.66
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	19.39
34	B	J1:5/2	D	J2:6/1	16.38
35	D	J2:2/3	C	J1:7/1	72.03
36	E	J2:4/3	C	J1:7/1	67.53
37	A	J1:2/3	C	J1:7/1	62.25
38	B	J1:5/1	C	J1:7/1	15.27
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	39.03
43	C	J1:8/2	C	J1:7/1	-

Basic Results Summary

44	C	J1:8/2	B	J1:3/3	57.38
45	C	J1:8/2	B	J1:3/1	57.51
46	C	J1:8/2	E	J2:3/1	33.20
47	C	J1:8/2	D	J2:6/1	10.88

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 16: AM Base + Com + Dev (VISUM)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	8.13
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	41.09
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	3.24
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	22.79
12	D	J2:2/3	B	J1:3/2	12.64
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	9.32
17	D	J2:2/3	B	J1:3/3	12.59
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	10.27
22	A	J1:2/2	B	J1:3/2	21.30
23	C	J1:8/2	A	J2:5/1	25.39
24	B	J1:5/2	A	J2:5/1	22.04
27	C	J1:8/2	B	J1:3/2	37.51
28	A	J1:2/2	B	J1:3/1	21.30
30	A	J1:2/2	B	J1:3/3	21.31
31	D	J2:2/2	B	J1:3/1	12.66
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	9.39
34	B	J1:5/2	D	J2:6/1	6.38
35	D	J2:2/3	C	J1:7/1	52.03
36	E	J2:4/3	C	J1:7/1	52.53
37	A	J1:2/3	C	J1:7/1	52.25
38	B	J1:5/1	C	J1:7/1	10.27
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	24.03
43	C	J1:8/2	C	J1:7/1	-

Basic Results Summary

44	C	J1:8/2	B	J1:3/3	37.38
45	C	J1:8/2	B	J1:3/1	37.51
46	C	J1:8/2	E	J2:3/1	23.20
47	C	J1:8/2	D	J2:6/1	5.88

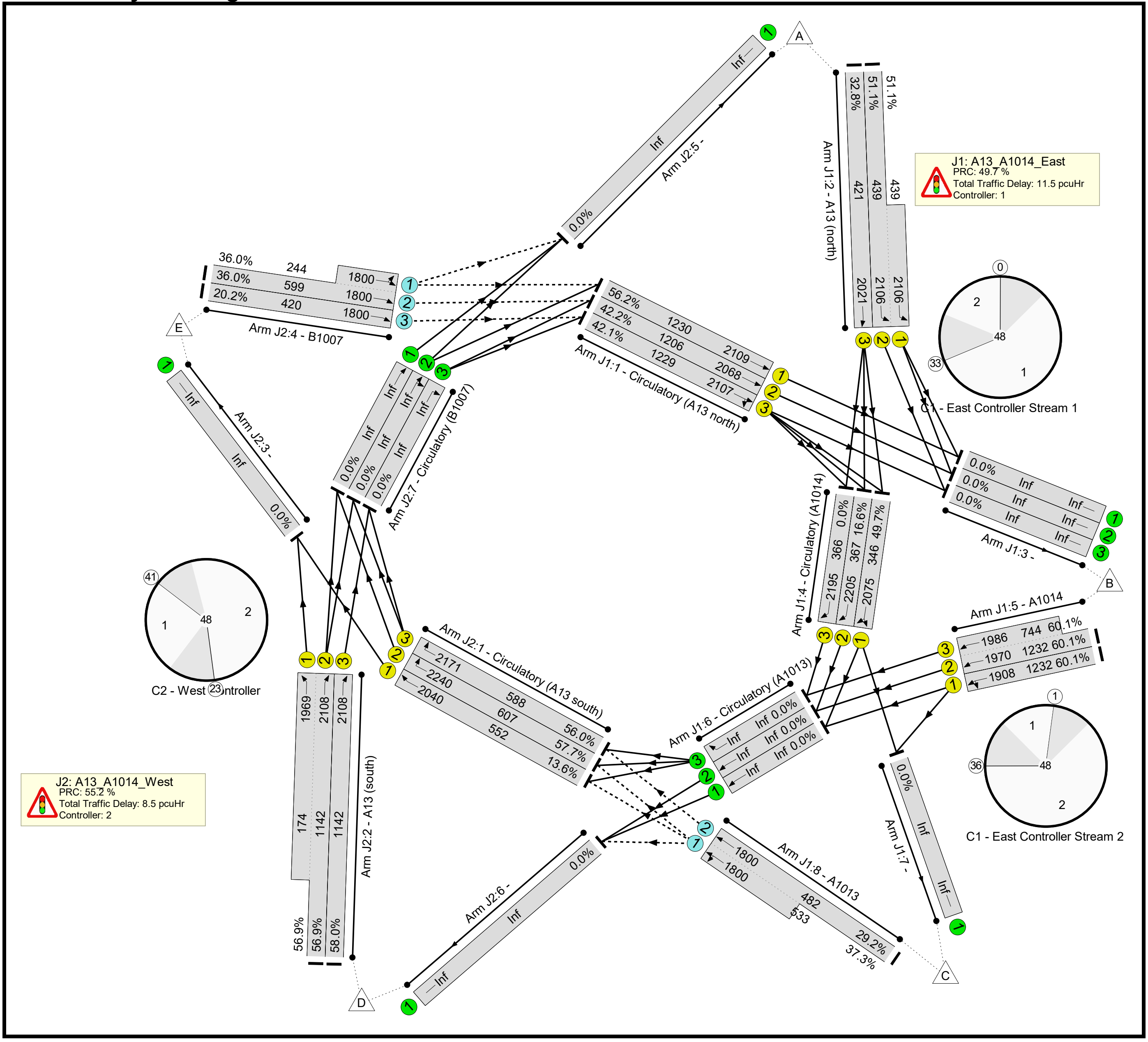
Traffic Flows, Actual

Actual Flow :

	Destination						
		A	B	C	D	E	Tot.
Origin	A	0	217	169	0	0	386
	B	260	0	286	1215	0	1761
	C	240	67	0	74	136	517
	D	0	1156	12	0	123	1291
	E	27	265	65	94	0	451
	Tot.	527	1705	532	1383	259	4406

Scenario 17: 'I/P Base + Com + Dev (VISUM)' (FG17: 'I/P Base + Com + Dev (VISUM)', 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: A13/A1014	-	-	-		-	-	-	-	-	-	**60.1%**	**1373**	**0**	**0**	**20.0**	-	-
J1: A13_A1014_East	-	-	-		-	-	-	-	-	-	**60.1%**	**680**	**0**	**0**	**11.5**	-	-
1/1	Circulatory (A13 north) Ahead	U	C1:A		1	27	-	691	2109	1230	56.2%	-	-	-	0.8	4.1	1.3
1/2	Circulatory (A13 north) Ahead	U	C1:A		1	27	-	509	2068	1206	42.2%	-	-	-	0.7	5.3	2.4
1/3	Circulatory (A13 north) Ahead Right	U	C1:A		1	27	-	518	2107	1229	42.1%	-	-	-	0.7	4.6	1.8
2/2+2/1	A13 (north) Left	U	C1:B		1	9	-	448	2106:2106	439+439	51.1 : 51.1%	-	-	-	2.6 (1.3+1.3)	21.0 (21.0:21.0)	3.1
2/3	A13 (north) Ahead	U	C1:B		1	9	-	138	2021	421	32.8%	-	-	-	0.9	22.5	1.8
4/1	Circulatory (A1014) Right Ahead	U	C1:C		1	7	-	172	2075	346	49.7%	-	-	-	0.9	18.2	1.2
4/2	Circulatory (A1014) Right	U	C1:C		1	7	-	61	2205	367	16.6%	-	-	-	0.5	27.3	0.9
4/3	Circulatory (A1014) Right	U	C1:C		1	7	-	0	2195	366	0.0%	-	-	-	0.0	0.0	0.0
5/1	A1014 Ahead Left	U	C1:D		1	30	-	741	1908	1232	60.1%	-	-	-	1.8	8.6	6.3
5/2+5/3	A1014 Ahead	U	C1:D		1	30	-	1187	1970:1986	1232+744	60.1 : 60.1%	-	-	-	2.2 (1.5+0.8)	6.7 (7.1:6.2)	6.3
8/2+8/1	A1013 Ahead Left	O	-		-	-	-	340	1800:1800	482+533	29.2 : 37.3%	680	0	0	0.4 (0.2+0.3)	4.8 (4.8:4.8)	1.2
J2: A13_A1014_West	-	-	-		-	-	-	-	-	-	**58.0%**	**693**	**0**	**0**	**8.5**	-	-
1/1	Circulatory (A13 south) Ahead	U	C2:A		1	12	-	75	2040	552	13.6%	-	-	-	0.3	15.7	0.6

Basic Results Summary

1/2	Circulatory (A13 south) Right	U	C2:A		1	12	-	350	2240	607	57.7%	-	-	-	1.8	18.7	4.6
1/3	Circulatory (A13 south) Right	U	C2:A		1	12	-	329	2171	588	56.0%	-	-	-	1.7	18.9	4.3
2/2+2/1	A13 (south) Ahead Ahead2	U	C2:B		1	25	-	749	2108:1969	1142+174	56.9 : 56.9%	-	-	-	2.1 (1.9+0.2)	10.2 (10.5:8.5)	6.3
2/3	A13 (south) Ahead	U	C2:B		1	25	-	662	2108	1142	58.0%	-	-	-	2.0	11.1	6.6
4/2+4/1	B1007 Left Ahead	O	-		-	-	-	304	1800:1800	599+244	36.0 : 36.0%	608	0	0	0.3 (0.2+0.1)	3.8 (3.8:3.7)	0.8
4/3	B1007 Ahead	O	-		-	-	-	85	1800	420	20.2%	85	0	0	0.2	7.0	0.4

C1 - East Controller Stream: 1 PRC for Signalled Lanes (%): 60.2 Total Delay for Signalled Lanes (pcuHr): 5.68 Cycle Time (s): 48
C1 - East Controller Stream: 2 PRC for Signalled Lanes (%): 49.7 Total Delay for Signalled Lanes (pcuHr): 5.33 Cycle Time (s): 48
C2 - West Controller PRC for Signalled Lanes (%): 55.2 Total Delay for Signalled Lanes (pcuHr): 8.04 Cycle Time (s): 48
PRC Over All Lanes (%): 49.7 Total Delay Over All Lanes(pcuHr): 19.97

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E
A	0.0	26.0	47.5	0.0	0.0
B	44.4	0.0	13.6	17.7	0.0
C	39.7	58.6	0.0	9.8	30.4
D	0.0	29.3	64.4	0.0	13.5
E	8.7	20.8	60.5	61.1	0.0

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E
A	0.0	21.0	37.5	0.0	0.0
B	24.4	0.0	8.6	7.7	0.0
C	24.7	38.6	0.0	4.8	20.4
D	0.0	14.3	44.4	0.0	8.5
E	3.7	10.8	45.5	41.1	0.0

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 17: I/P Base + Com + Dev (VISUM)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	13.50
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	61.12
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	8.66
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	44.43
12	D	J2:2/3	B	J1:3/2	29.29
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	20.81
17	D	J2:2/3	B	J1:3/3	29.18
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	18.58
22	A	J1:2/2	B	J1:3/2	26.03
23	C	J1:8/2	A	J2:5/1	39.78
24	B	J1:5/2	A	J2:5/1	44.33
27	C	J1:8/2	B	J1:3/2	58.77
28	A	J1:2/2	B	J1:3/1	26.03
30	A	J1:2/2	B	J1:3/3	26.03
31	D	J2:2/2	B	J1:3/1	29.31
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	21.05
34	B	J1:5/2	D	J2:6/1	17.10
35	D	J2:2/3	C	J1:7/1	64.43
36	E	J2:4/3	C	J1:7/1	60.54
37	A	J1:2/3	C	J1:7/1	47.53
38	B	J1:5/1	C	J1:7/1	13.58
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	39.62
43	C	J1:8/2	C	J1:7/1	-

Basic Results Summary

44	C	J1:8/2	B	J1:3/3	58.41
45	C	J1:8/2	B	J1:3/1	58.69
46	C	J1:8/2	E	J2:3/1	30.43
47	C	J1:8/2	D	J2:6/1	9.75

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 17: I/P Base + Com + Dev (VISUM)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	8.50
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	41.12
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	3.66
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	24.43
12	D	J2:2/3	B	J1:3/2	14.29
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	10.81
17	D	J2:2/3	B	J1:3/3	14.18
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	8.58
22	A	J1:2/2	B	J1:3/2	21.03
23	C	J1:8/2	A	J2:5/1	24.78
24	B	J1:5/2	A	J2:5/1	24.33
27	C	J1:8/2	B	J1:3/2	38.77
28	A	J1:2/2	B	J1:3/1	21.03
30	A	J1:2/2	B	J1:3/3	21.03
31	D	J2:2/2	B	J1:3/1	14.31
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	11.05
34	B	J1:5/2	D	J2:6/1	7.10
35	D	J2:2/3	C	J1:7/1	44.43
36	E	J2:4/3	C	J1:7/1	45.54
37	A	J1:2/3	C	J1:7/1	37.53
38	B	J1:5/1	C	J1:7/1	8.58
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	24.62
43	C	J1:8/2	C	J1:7/1	-

Basic Results Summary

44	C	J1:8/2	B	J1:3/3	38.41
45	C	J1:8/2	B	J1:3/1	38.69
46	C	J1:8/2	E	J2:3/1	20.43
47	C	J1:8/2	D	J2:6/1	4.75

Traffic Flows, Actual

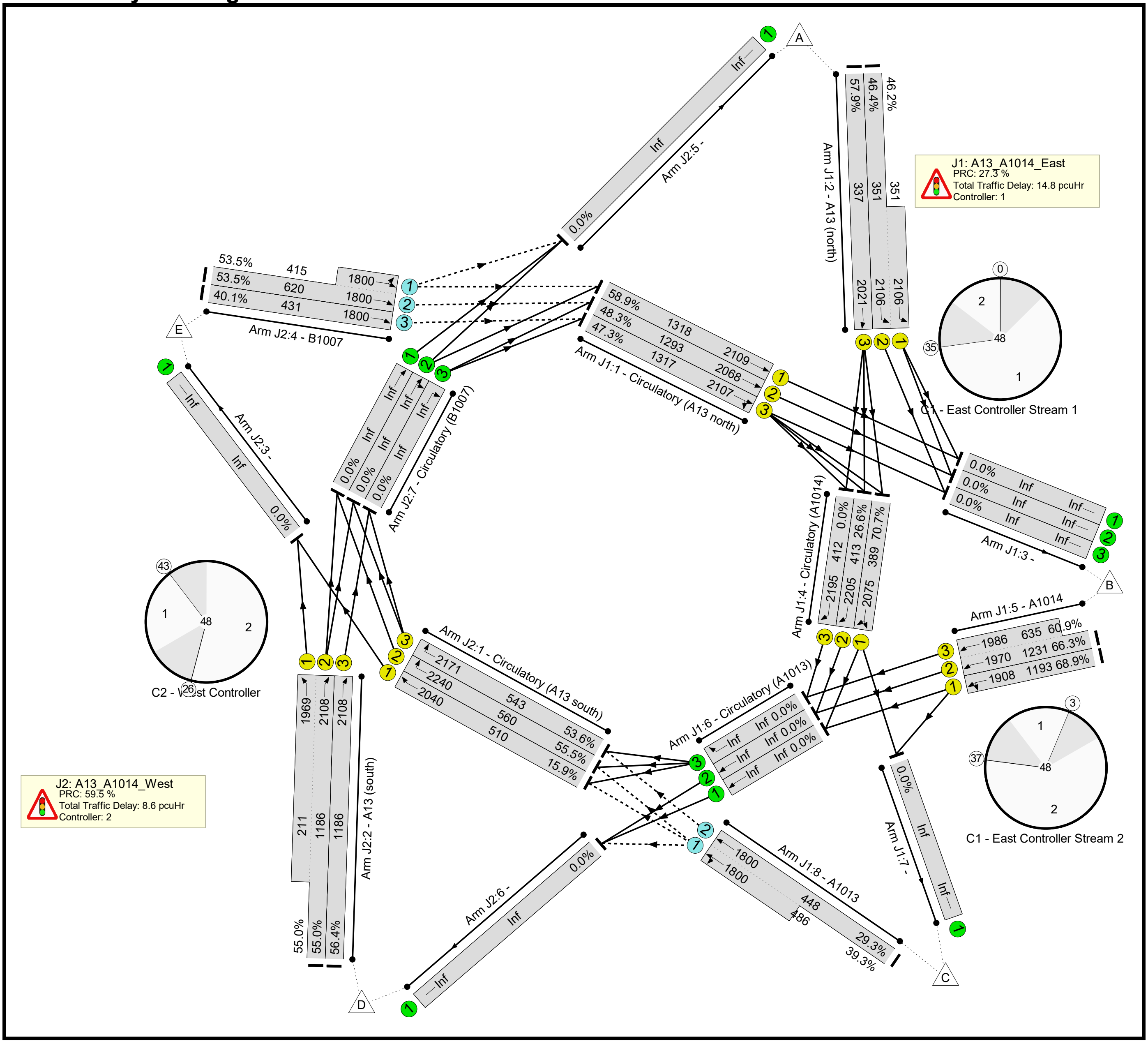
Actual Flow :

	Destination						
		A	B	C	D	E	Tot.
Origin	A	0	448	138	0	0	586
	B	447	0	179	1302	0	1928
	C	159	73	0	33	75	340
	D	0	1302	10	0	99	1411
	E	56	248	24	61	0	389
	Tot.	662	2071	351	1396	174	4654

Basic Results Summary

Scenario 18: 'PM Base + Com + Dev (VISUM)' (FG18: 'PM Base + Com + Dev (VISUM)', 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: A13/A1014	-	-	-		-	-	-	-	-	-	**70.7%**	**1925**	**0**	**0**	**23.4**	-	-
J1: A13_A1014_East	-	-	-		-	-	-	-	-	-	**70.7%**	**644**	**0**	**0**	**14.8**	-	-
1/1	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	777	2109	1318	58.9%	-	-	-	1.0	4.5	1.8
1/2	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	624	2068	1293	48.3%	-	-	-	0.9	5.3	3.0
1/3	Circulatory (A13 north) Ahead Right	U	C1:A		1	29	-	623	2107	1317	47.3%	-	-	-	0.8	4.8	2.4
2/2+2/1	A13 (north) Left	U	C1:B		1	7	-	325	2106:2106	351+351	46.4 : 46.2%	-	-	-	2.1 (1.0+1.0)	22.9 (22.9:22.8)	2.4
2/3	A13 (north) Ahead	U	C1:B		1	7	-	195	2021	337	57.9%	-	-	-	1.7	31.0	3.1
4/1	Circulatory (A1014) Right Ahead	U	C1:C		1	8	-	275	2075	389	70.7%	-	-	-	1.9	24.4	2.5
4/2	Circulatory (A1014) Right	U	C1:C		1	8	-	110	2205	413	26.6%	-	-	-	0.8	27.1	1.6
4/3	Circulatory (A1014) Right	U	C1:C		1	8	-	0	2195	412	0.0%	-	-	-	0.0	0.0	0.0
5/1	A1014 Ahead Left	U	C1:D		1	29	-	822	1908	1193	68.9%	-	-	-	2.5	10.8	8.2
5/2+5/3	A1014 Ahead	U	C1:D		1	29	-	1203	1970:1986	1231+635	66.3 : 60.9%	-	-	-	2.7 (1.9+0.7)	8.0 (8.5:6.9)	7.7
8/2+8/1	A1013 Ahead Left	O	-		-	-	-	322	1800:1800	448+486	29.3 : 39.3%	644	0	0	0.6 (0.2+0.3)	6.2 (6.1:6.2)	1.4
J2: A13_A1014_West	-	-	-		-	-	-	-	-	-	**56.4%**	**1281**	**0**	**0**	**8.6**	-	-
1/1	Circulatory (A13 south) Ahead	U	C2:A		1	11	-	81	2040	510	15.9%	-	-	-	0.4	17.1	0.7

Basic Results Summary

1/2	Circulatory (A13 south) Right	U	C2:A		1	11	-	311	2240	560	55.5%	-	-	-	1.7	19.3	4.0
1/3	Circulatory (A13 south) Right	U	C2:A		1	11	-	291	2171	543	53.6%	-	-	-	1.6	19.4	3.4
2/2+2/1	A13 (south) Ahead Ahead2	U	C2:B		1	26	-	768	2108:1969	1186+211	55.0 : 55.0%	-	-	-	2.0 (1.7+0.3)	9.3 (9.5:7.8)	6.0
2/3	A13 (south) Ahead	U	C2:B		1	26	-	669	2108	1186	56.4%	-	-	-	1.9	10.2	6.2
4/2+4/1	B1007 Left Ahead	O	-		-	-	-	554	1800:1800	620+415	53.5 : 53.5%	1108	0	0	0.6 (0.4+0.2)	4.2 (4.2:4.0)	1.5
4/3	B1007 Ahead	O	-		-	-	-	173	1800	431	40.1%	173	0	0	0.4	9.0	1.1

C1 - East Controller	Stream: 1	PRC for Signalled Lanes (%):	52.7	Total Delay for Signalled Lanes (pcuHr):	6.47	Cycle Time (s):	48
C1 - East Controller	Stream: 2	PRC for Signalled Lanes (%):	27.3	Total Delay for Signalled Lanes (pcuHr):	7.82	Cycle Time (s):	48
C2 - West Controller		PRC for Signalled Lanes (%):	59.5	Total Delay for Signalled Lanes (pcuHr):	7.48	Cycle Time (s):	48
		PRC Over All Lanes (%):	27.3	Total Delay Over All Lanes(pcuHr):	23.39		

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E
A	0.0	27.9	60.5	0.0	0.0
B	45.6	0.0	15.8	19.5	0.0
C	41.7	58.1	0.0	11.2	33.3
D	0.0	28.5	68.9	0.0	12.8
E	9.0	20.7	67.0	62.3	0.0

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E
A	0.0	22.9	50.5	0.0	0.0
B	25.6	0.0	10.8	9.5	0.0
C	26.7	38.1	0.0	6.2	23.3
D	0.0	13.5	48.9	0.0	7.8
E	4.0	10.7	52.0	42.3	0.0

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 18: PM Base + Com + Dev (VISUM)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	12.77
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	62.33
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	9.03
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	45.65
12	D	J2:2/3	B	J1:3/2	28.61
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	20.70
17	D	J2:2/3	B	J1:3/3	28.47
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	20.76
22	A	J1:2/2	B	J1:3/2	27.85
23	C	J1:8/2	A	J2:5/1	41.84
24	B	J1:5/2	A	J2:5/1	45.49
27	C	J1:8/2	B	J1:3/2	58.35
28	A	J1:2/2	B	J1:3/1	27.85
30	A	J1:2/2	B	J1:3/3	27.86
31	D	J2:2/2	B	J1:3/1	28.49
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	20.87
34	B	J1:5/2	D	J2:6/1	18.47
35	D	J2:2/3	C	J1:7/1	68.91
36	E	J2:4/3	C	J1:7/1	66.97
37	A	J1:2/3	C	J1:7/1	60.55
38	B	J1:5/1	C	J1:7/1	15.76
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	41.39
43	C	J1:8/2	C	J1:7/1	-

Basic Results Summary

44	C	J1:8/2	B	J1:3/3	57.98
45	C	J1:8/2	B	J1:3/1	58.35
46	C	J1:8/2	E	J2:3/1	33.27
47	C	J1:8/2	D	J2:6/1	11.20

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 18: PM Base + Com + Dev (VISUM)
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	7.77
4	E	J2:4/3	D	J2:6/1	-
5	E	J2:4/3	D	J2:6/1	42.33
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	4.03
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	25.65
12	D	J2:2/3	B	J1:3/2	13.61
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	-
16	E	J2:4/2	B	J1:3/2	10.70
17	D	J2:2/3	B	J1:3/3	13.47
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	10.76
22	A	J1:2/2	B	J1:3/2	22.85
23	C	J1:8/2	A	J2:5/1	26.84
24	B	J1:5/2	A	J2:5/1	25.49
27	C	J1:8/2	B	J1:3/2	38.35
28	A	J1:2/2	B	J1:3/1	22.85
30	A	J1:2/2	B	J1:3/3	22.86
31	D	J2:2/2	B	J1:3/1	13.49
32	B	J1:5/2	E	J2:3/1	-
33	E	J2:4/2	B	J1:3/1	10.87
34	B	J1:5/2	D	J2:6/1	8.47
35	D	J2:2/3	C	J1:7/1	48.91
36	E	J2:4/3	C	J1:7/1	51.97
37	A	J1:2/3	C	J1:7/1	50.55
38	B	J1:5/1	C	J1:7/1	10.76
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	26.39
43	C	J1:8/2	C	J1:7/1	-

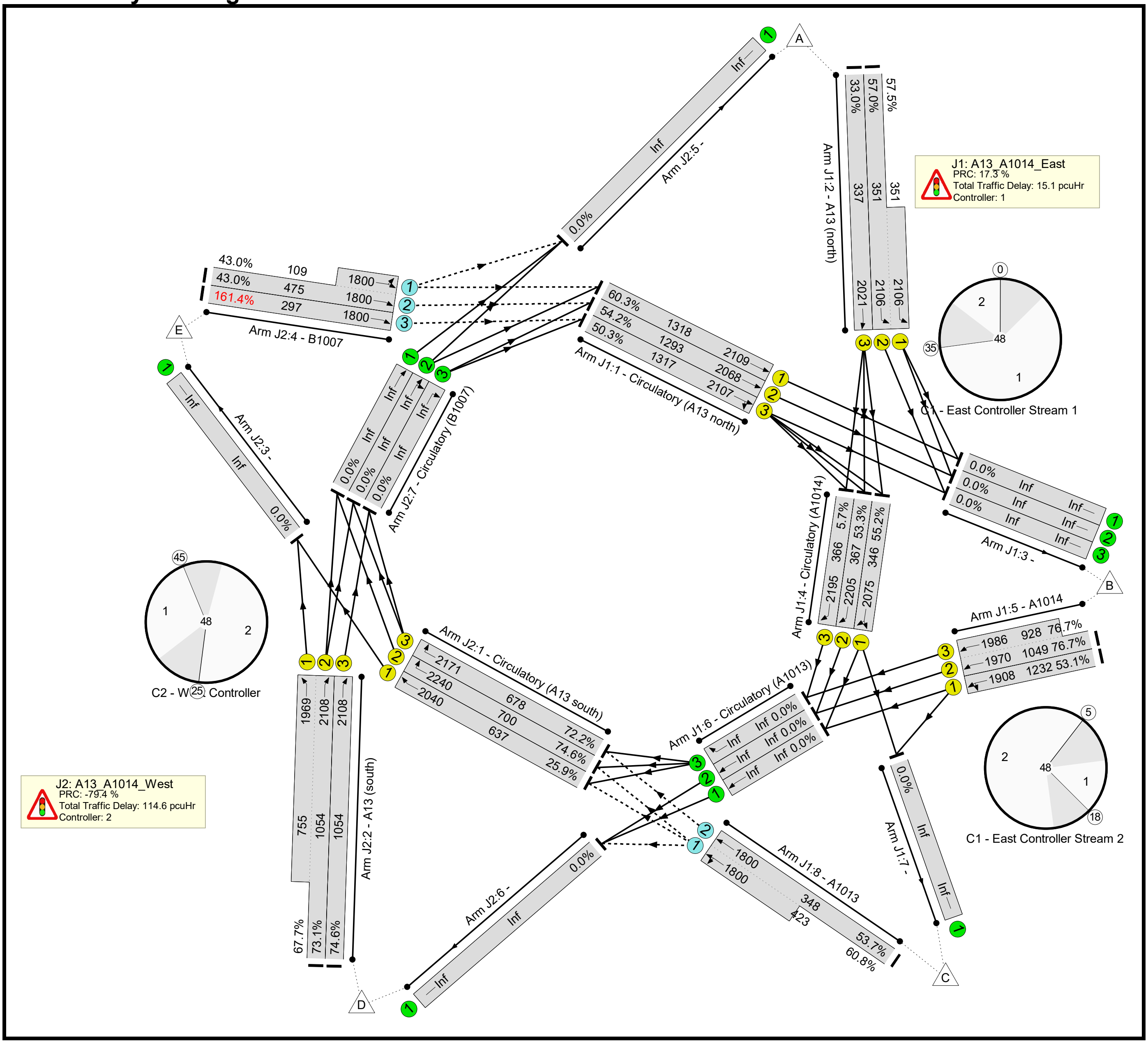
Basic Results Summary

44	C	J1:8/2	B	J1:3/3	37.98
45	C	J1:8/2	B	J1:3/1	38.35
46	C	J1:8/2	E	J2:3/1	23.27
47	C	J1:8/2	D	J2:6/1	6.20

Traffic Flows, Actual
Actual Flow :

		Destination					
		A	B	C	D	E	Tot.
Origin	A	0	325	195	0	0	520
	B	387	0	209	1429	0	2025
	C	132	83	0	26	81	322
	D	0	1304	17	0	116	1437
	E	107	447	63	110	0	727
	Tot.	626	2159	484	1565	197	5031

Scenario 19: 'LTC AM DM' (FG21: 'LTC AM DM', Plan 1: 'Network Control Plan 1')
Network Layout Diagram



Basic Results Summary

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: A13/A1014	-	-	-		-	-	-	-	-	-	**161.4%**	**1687**	**0**	**0**	**129.6**	-	-
J1: A13_A1014_East	-	-	-		-	-	-	-	-	-	**76.7%**	**888**	**0**	**0**	**15.1**	-	-
1/1	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	795	2109	1318	60.3%	-	-	-	0.9	4.0	1.3
1/2	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	701	2068	1293	54.2%	-	-	-	0.9	4.7	2.1
1/3	Circulatory (A13 north) Ahead Right	U	C1:A		1	29	-	845	2107	1317	50.3%	-	-	-	1.2	6.4	3.6
2/2+2/1	A13 (north) Left	U	C1:B		1	7	-	402	2106:2106	351+351	57.0 : 57.5%	-	-	-	2.7 (1.4+1.4)	24.4 (24.4:24.4)	3.1
2/3	A13 (north) Ahead	U	C1:B		1	7	-	111	2021	337	33.0%	-	-	-	0.8	25.6	1.5
4/1	Circulatory (A1014) Right Ahead	U	C1:C		1	7	-	253	2075	346	55.2%	-	-	-	1.2	21.9	2.6
4/2	Circulatory (A1014) Right	U	C1:C		1	7	-	316	2205	367	53.3%	-	-	-	1.0	18.3	1.9
4/3	Circulatory (A1014) Right	U	C1:C		1	7	-	21	2195	366	5.7%	-	-	-	0.1	16.6	0.3
5/1	A1014 Ahead Left	U	C1:D		1	30	-	654	1908	1232	53.1%	-	-	-	1.4	7.7	5.1
5/2+5/3	A1014 Ahead	U	C1:D		1	30	-	1517	1970:1986	1049+928	76.7 : 76.7%	-	-	-	3.7 (2.0+1.7)	8.8 (9.0:8.6)	7.9
8/2+8/1	A1013 Ahead Left	O	-		-	-	-	444	1800:1800	348+423	53.7 : 60.8%	888	0	0	1.2 (0.5+0.7)	9.7 (10.4:9.3)	2.7
J2: A13_A1014_West	-	-	-		-	-	-	-	-	-	**161.4%**	**799**	**0**	**0**	**114.6**	-	-
1/1	Circulatory (A13 south) Ahead	U	C2:A		1	14	-	165	2040	637	25.9%	-	-	-	0.7	15.6	1.6

Basic Results Summary

1/2	Circulatory (A13 south) Right	U	C2:A		1	14	-	522	2240	700	74.6%	-	-	-	3.6	25.0	7.4
1/3	Circulatory (A13 south) Right	U	C2:A		1	14	-	490	2171	678	72.2%	-	-	-	3.2	23.7	6.9
2/2+2/1	A13 (south) Ahead Ahead2	U	C2:B		1	23	-	1282	2108:1969	1054+755	73.1 : 67.7%	-	-	-	4.4 (2.8+1.6)	12.3 (12.9:11.5)	9.1
2/3	A13 (south) Ahead	U	C2:B		1	23	-	786	2108	1054	74.6%	-	-	-	3.5	16.2	9.7
4/2+4/1	B1007 Left Ahead	O	-		-	-	-	251	1800:1800	475+109	43.0 : 43.0%	502	0	0	0.5 (0.4+0.1)	6.9 (7.0:6.4)	1.2
4/3	B1007 Ahead	O	-		-	-	-	479	1800	297	161.4%	297	0	0	98.6	741.2	110.3

C1 - East Controller Stream: 1 PRC for Signalled Lanes (%): 49.2 Total Delay for Signalled Lanes (pcuHr): 6.50 Cycle Time (s): 48
C1 - East Controller Stream: 2 PRC for Signalled Lanes (%): 17.3 Total Delay for Signalled Lanes (pcuHr): 7.35 Cycle Time (s): 48
C2 - West Controller PRC for Signalled Lanes (%): 20.7 Total Delay for Signalled Lanes (pcuHr): 15.49 Cycle Time (s): 48
PRC Over All Lanes (%): -79.4 Total Delay Over All Lanes(pcuHr): 129.63

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E
A	0.0	29.4	59.8	0.0	76.6
B	49.8	0.0	12.7	18.4	37.3
C	53.9	71.7	0.0	0.0	40.2
D	0.0	33.2	0.0	0.0	16.5
E	11.4	22.7	785.0	788.9	0.0

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E
A	0.0	24.4	49.8	0.0	56.6
B	29.8	0.0	7.7	8.4	22.3
C	38.9	51.7	0.0	0.0	30.2
D	0.0	18.2	0.0	0.0	11.5
E	6.4	12.7	770.0	768.9	0.0

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 19: LTC AM DM
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	16.51
4	E	J2:4/3	D	J2:6/1	790.04
5	E	J2:4/3	D	J2:6/1	788.58
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	11.36
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	50.19
12	D	J2:2/3	B	J1:3/2	34.72
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	76.63
16	E	J2:4/2	B	J1:3/2	22.69
17	D	J2:2/3	B	J1:3/3	34.44
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	17.69
22	A	J1:2/2	B	J1:3/2	29.43
23	C	J1:8/2	A	J2:5/1	53.96
24	B	J1:5/2	A	J2:5/1	49.41
27	C	J1:8/2	B	J1:3/2	71.19
28	A	J1:2/2	B	J1:3/1	29.43
30	A	J1:2/2	B	J1:3/3	29.40
31	D	J2:2/2	B	J1:3/1	31.75
32	B	J1:5/2	E	J2:3/1	37.30
33	E	J2:4/2	B	J1:3/1	22.48
34	B	J1:5/2	D	J2:6/1	18.97
35	D	J2:2/3	C	J1:7/1	-
36	E	J2:4/3	C	J1:7/1	785.04
37	A	J1:2/3	C	J1:7/1	59.80
38	B	J1:5/1	C	J1:7/1	12.69
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	53.70
43	C	J1:8/2	C	J1:7/1	-
44	C	J1:8/2	B	J1:3/3	72.53
45	C	J1:8/2	B	J1:3/1	70.67

Basic Results Summary

46	C	J1:8/2	E	J2:3/1	40.16
47	C	J1:8/2	D	J2:6/1	-

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 19: LTC AM DM
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	11.51
4	E	J2:4/3	D	J2:6/1	770.04
5	E	J2:4/3	D	J2:6/1	768.58
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	6.36
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	30.19
12	D	J2:2/3	B	J1:3/2	19.72
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	56.63
16	E	J2:4/2	B	J1:3/2	12.69
17	D	J2:2/3	B	J1:3/3	19.44
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	7.69
22	A	J1:2/2	B	J1:3/2	24.43
23	C	J1:8/2	A	J2:5/1	38.96
24	B	J1:5/2	A	J2:5/1	29.41
27	C	J1:8/2	B	J1:3/2	51.19
28	A	J1:2/2	B	J1:3/1	24.43
30	A	J1:2/2	B	J1:3/3	24.40
31	D	J2:2/2	B	J1:3/1	16.75
32	B	J1:5/2	E	J2:3/1	22.30
33	E	J2:4/2	B	J1:3/1	12.48
34	B	J1:5/2	D	J2:6/1	8.97
35	D	J2:2/3	C	J1:7/1	-
36	E	J2:4/3	C	J1:7/1	770.04
37	A	J1:2/3	C	J1:7/1	49.80
38	B	J1:5/1	C	J1:7/1	7.69
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	38.70
43	C	J1:8/2	C	J1:7/1	-
44	C	J1:8/2	B	J1:3/3	52.53
45	C	J1:8/2	B	J1:3/1	50.67

Basic Results Summary

46	C	J1:8/2	E	J2:3/1	30.16
47	C	J1:8/2	D	J2:6/1	-

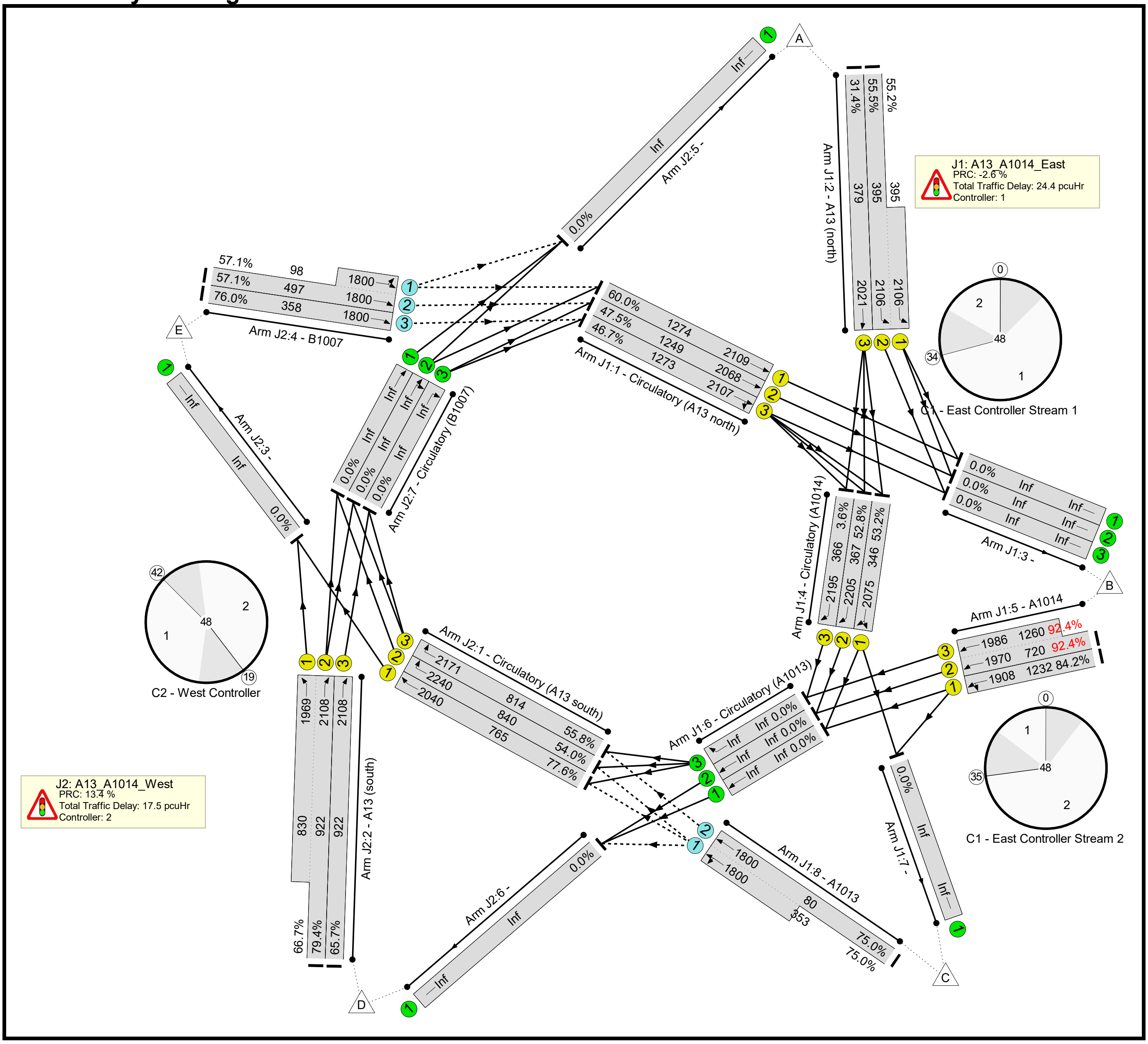
Traffic Flows, Actual

Actual Flow :

	Destination					
Origin		A	B	C	D	E	Tot.
	A	0	402	90	0	21	513
	B	609	0	38	1421	103	2171
	C	317	86	0	0	41	444
	D	0	1557	0	0	511	2068
	E	32	219	61	418	0	730
	Tot.	958	2264	189	1839	676	5926

Scenario 20: 'LTC PM DM' (FG22: 'LTC PM DM', 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: A13/A1014	-	-	-		-	-	-	-	-	-	**92.4%**	**1602**	**0**	**0**	**41.9**	-	-
J1: A13_A1014_East	-	-	-		-	-	-	-	-	-	**92.4%**	**650**	**0**	**0**	**24.4**	-	-
1/1	Circulatory (A13 north) Ahead	U	C1:A		1	28	-	765	2109	1274	60.0%	-	-	-	0.8	3.8	2.5
1/2	Circulatory (A13 north) Ahead	U	C1:A		1	28	-	594	2068	1249	47.5%	-	-	-	0.8	4.7	2.5
1/3	Circulatory (A13 north) Ahead Right	U	C1:A		1	28	-	594	2107	1273	46.7%	-	-	-	0.8	4.7	2.5
2/2+2/1	A13 (north) Left	U	C1:B		1	8	-	437	2106:2106	395+395	55.5 : 55.2%	-	-	-	2.8 (1.4+1.4)	22.8 (22.8:22.8)	3.2
2/3	A13 (north) Ahead	U	C1:B		1	8	-	119	2021	379	31.4%	-	-	-	0.8	23.8	1.6
4/1	Circulatory (A1014) Right Ahead	U	C1:C		1	7	-	184	2075	346	53.2%	-	-	-	1.2	23.4	1.9
4/2	Circulatory (A1014) Right	U	C1:C		1	7	-	194	2205	367	52.8%	-	-	-	1.6	29.9	3.1
4/3	Circulatory (A1014) Right	U	C1:C		1	7	-	13	2195	366	3.6%	-	-	-	0.0	12.7	0.1
5/1	A1014 Ahead Left	U	C1:D		1	30	-	1038	1908	1232	84.2%	-	-	-	4.5	15.6	13.3
5/2+5/3	A1014 Ahead	U	C1:D		1	30	-	1829	1970:1986	720+1260	92.4 : 92.4%	-	-	-	8.8 (2.9+5.9)	17.4 (15.6:18.4)	18.9
8/2+8/1	A1013 Ahead Left	O	-		-	-	-	325	1800:1800	80+353	75.0 : 75.0%	650	0	0	2.3 (0.4+1.8)	25.1 (26.2:24.8)	4.4
J2: A13_A1014_West	-	-	-		-	-	-	-	-	-	**79.4%**	**952**	**0**	**0**	**17.5**	-	-
1/1	Circulatory (A13 south) Ahead	U	C2:A		1	17	-	594	2040	765	77.6%	-	-	-	3.1	19.1	8.1

Basic Results Summary

1/2	Circulatory (A13 south) Right	U	C2:A		1	17	-	454	2240	840	54.0%	-	-	-	2.0	15.5	5.0
1/3	Circulatory (A13 south) Right	U	C2:A		1	17	-	454	2171	814	55.8%	-	-	-	1.6	12.9	4.9
2/2+2/1	A13 (south) Ahead Ahead2	U	C2:B		1	20	-	1285	2108:1969	922+830	79.4 : 66.7%	-	-	-	5.4 (3.1+2.2)	15.0 (15.5:14.4)	9.7
2/3	A13 (south) Ahead	U	C2:B		1	20	-	606	2108	922	65.7%	-	-	-	2.7	16.3	7.2
4/2+4/1	B1007 Left Ahead	O	-		-	-	-	340	1800:1800	497+98	57.1 : 57.1%	680	0	0	0.8 (0.6+0.1)	8.0 (8.1:7.5)	1.8
4/3	B1007 Ahead	O	-		-	-	-	272	1800	358	76.0%	272	0	0	1.9	25.3	3.3

C1 - East Controller Stream: 1 PRC for Signalled Lanes (%): 49.9 Total Delay for Signalled Lanes (pcuHr): 5.93 Cycle Time (s): 48
C1 - East Controller Stream: 2 PRC for Signalled Lanes (%): -2.6 Total Delay for Signalled Lanes (pcuHr): 16.18 Cycle Time (s): 48
C2 - West Controller PRC for Signalled Lanes (%): 13.4 Total Delay for Signalled Lanes (pcuHr): 14.83 Cycle Time (s): 48
PRC Over All Lanes (%): -2.6 Total Delay Over All Lanes(pcuHr): 41.87

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E
A	0.0	27.8	52.5	0.0	86.1
B	49.1	0.0	20.6	25.6	50.6
C	63.3	89.5	0.0	0.0	63.1
D	0.0	34.1	0.0	0.0	19.4
E	12.5	24.3	76.8	81.8	0.0

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E
A	0.0	22.8	42.5	0.0	66.1
B	29.1	0.0	15.6	15.6	35.6
C	48.3	69.5	0.0	0.0	53.1
D	0.0	19.1	0.0	0.0	14.4
E	7.5	14.3	61.8	61.8	0.0

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 20: LTC PM DM
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	19.40
4	E	J2:4/3	D	J2:6/1	81.76
5	E	J2:4/3	D	J2:6/1	81.77
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	12.50
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	49.12
12	D	J2:2/3	B	J1:3/2	34.17
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	86.11
16	E	J2:4/2	B	J1:3/2	24.25
17	D	J2:2/3	B	J1:3/3	34.08
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	25.63
22	A	J1:2/2	B	J1:3/2	27.78
23	C	J1:8/2	A	J2:5/1	62.49
24	B	J1:5/2	A	J2:5/1	49.01
27	C	J1:8/2	B	J1:3/2	89.34
28	A	J1:2/2	B	J1:3/1	27.78
30	A	J1:2/2	B	J1:3/3	27.79
31	D	J2:2/2	B	J1:3/1	34.06
32	B	J1:5/2	E	J2:3/1	50.57
33	E	J2:4/2	B	J1:3/1	24.50
34	B	J1:5/2	D	J2:6/1	25.63
35	D	J2:2/3	C	J1:7/1	-
36	E	J2:4/3	C	J1:7/1	76.76
37	A	J1:2/3	C	J1:7/1	52.46
38	B	J1:5/1	C	J1:7/1	20.63
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	68.74
43	C	J1:8/2	C	J1:7/1	-
44	C	J1:8/2	B	J1:3/3	89.25
45	C	J1:8/2	B	J1:3/1	90.10

Basic Results Summary

46	C	J1:8/2	E	J2:3/1	63.05
47	C	J1:8/2	D	J2:6/1	-

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 20: LTC PM DM
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	14.40
4	E	J2:4/3	D	J2:6/1	61.76
5	E	J2:4/3	D	J2:6/1	61.77
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	7.50
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	29.12
12	D	J2:2/3	B	J1:3/2	19.17
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	66.11
16	E	J2:4/2	B	J1:3/2	14.25
17	D	J2:2/3	B	J1:3/3	19.08
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	15.63
22	A	J1:2/2	B	J1:3/2	22.78
23	C	J1:8/2	A	J2:5/1	47.49
24	B	J1:5/2	A	J2:5/1	29.01
27	C	J1:8/2	B	J1:3/2	69.34
28	A	J1:2/2	B	J1:3/1	22.78
30	A	J1:2/2	B	J1:3/3	22.79
31	D	J2:2/2	B	J1:3/1	19.06
32	B	J1:5/2	E	J2:3/1	35.57
33	E	J2:4/2	B	J1:3/1	14.50
34	B	J1:5/2	D	J2:6/1	15.63
35	D	J2:2/3	C	J1:7/1	-
36	E	J2:4/3	C	J1:7/1	61.76
37	A	J1:2/3	C	J1:7/1	42.46
38	B	J1:5/1	C	J1:7/1	15.63
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	53.74
43	C	J1:8/2	C	J1:7/1	-
44	C	J1:8/2	B	J1:3/3	69.25
45	C	J1:8/2	B	J1:3/1	70.10

Basic Results Summary

46	C	J1:8/2	E	J2:3/1	53.05
47	C	J1:8/2	D	J2:6/1	-

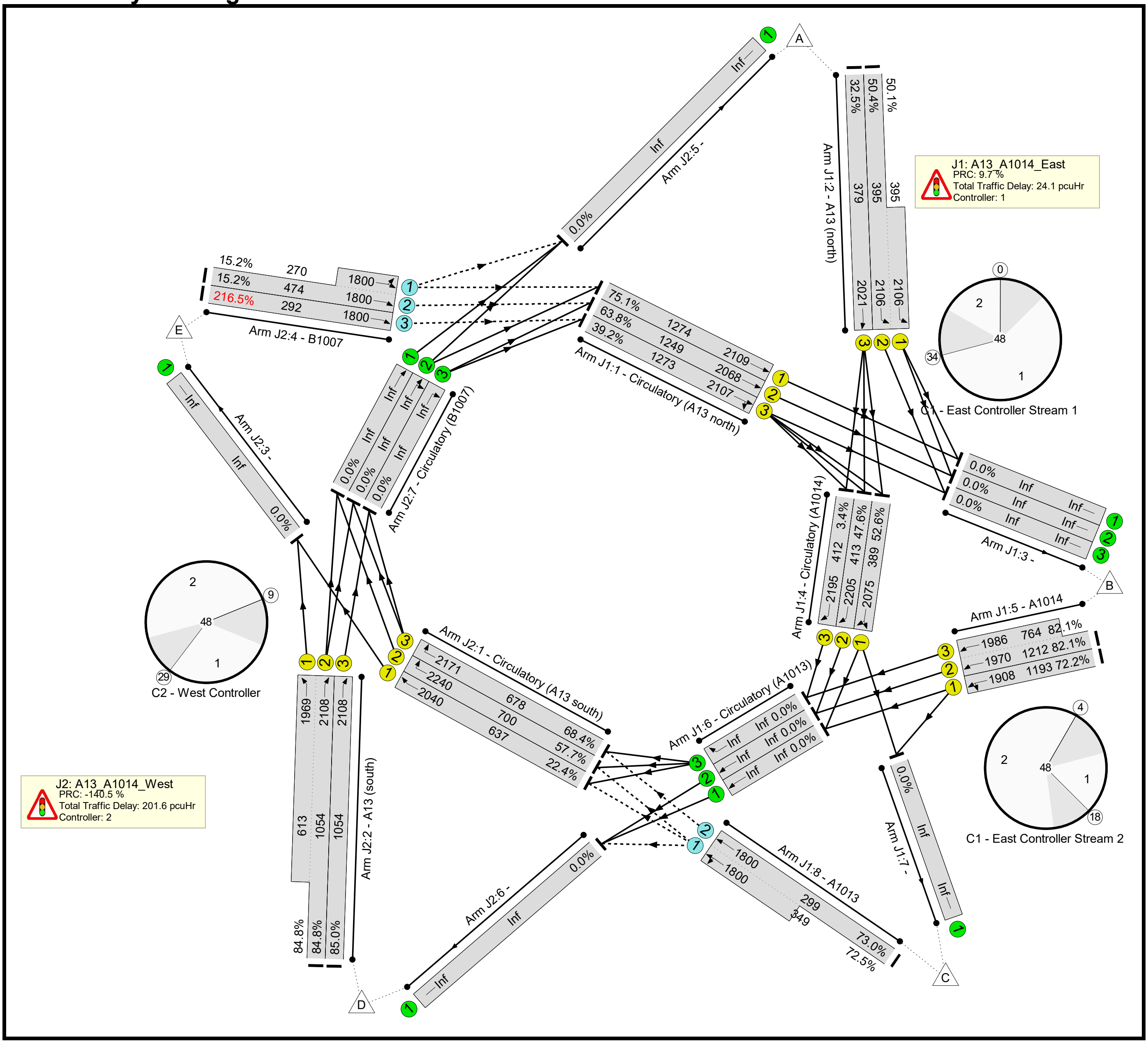
Traffic Flows, Actual

Actual Flow :

	Destination					
Origin		A	B	C	D	E	Tot.
	A	0	437	106	0	13	556
	B	669	0	84	1619	495	2867
	C	206	33	0	0	86	325
	D	0	1338	0	0	553	1891
	E	30	310	33	239	0	612
	Tot.	905	2118	223	1858	1147	6251

Scenario 21: 'LTC AM DS' (FG19: 'LTC AM DS', 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: A13/A1014	-	-	-		-	-	-	-	-	-	**216.5%**	**1460**	**0**	**0**	**225.7**	-	-
J1: A13_A1014_East	-	-	-		-	-	-	-	-	-	**82.1%**	**942**	**0**	**0**	**24.1**	-	-
1/1	Circulatory (A13 north) Ahead	U	C1:A		1	28	-	957	2109	1274	75.1%	-	-	-	4.0	14.9	13.8
1/2	Circulatory (A13 north) Ahead	U	C1:A		1	28	-	797	2068	1249	63.8%	-	-	-	2.6	11.9	11.0
1/3	Circulatory (A13 north) Ahead Right	U	C1:A		1	28	-	840	2107	1273	39.2%	-	-	-	1.3	9.3	4.7
2/2+2/1	A13 (north) Left	U	C1:B		1	8	-	397	2106:2106	395+395	50.4 : 50.1%	-	-	-	2.4 (1.2+1.2)	22.1 (22.1:22.1)	2.9
2/3	A13 (north) Ahead	U	C1:B		1	8	-	123	2021	379	32.5%	-	-	-	0.8	23.9	1.6
4/1	Circulatory (A1014) Right Ahead	U	C1:C		1	8	-	316	2075	389	52.6%	-	-	-	1.3	23.3	3.1
4/2	Circulatory (A1014) Right	U	C1:C		1	8	-	426	2205	413	47.6%	-	-	-	1.2	22.3	2.3
4/3	Circulatory (A1014) Right	U	C1:C		1	8	-	14	2195	412	3.4%	-	-	-	0.1	15.7	0.2
5/1	A1014 Ahead Left	U	C1:D		1	29	-	861	1908	1193	72.2%	-	-	-	2.8	11.5	8.9
5/2+5/3	A1014 Ahead	U	C1:D		1	29	-	1622	1970:1986	1212+764	82.1 : 82.1%	-	-	-	5.0 (3.3+1.7)	11.1 (11.8:10.0)	12.2
8/2+8/1	A1013 Ahead Left	O	-		-	-	-	471	1800:1800	299+349	73.0 : 72.5%	942	0	0	2.6 (1.2+1.3)	19.5 (20.6:18.6)	4.1
J2: A13_A1014_West	-	-	-		-	-	-	-	-	-	**216.5%**	**518**	**0**	**0**	**201.6**	-	-
1/1	Circulatory (A13 south) Ahead	U	C2:A		1	14	-	143	2040	637	22.4%	-	-	-	0.7	17.9	1.6

Basic Results Summary

1/2	Circulatory (A13 south) Right	U	C2:A		1	14	-	405	2240	700	57.7%	-	-	-	2.8	25.2	5.9
1/3	Circulatory (A13 south) Right	U	C2:A		1	14	-	464	2171	678	68.4%	-	-	-	3.0	23.0	6.5
2/2+2/1	A13 (south) Ahead Ahead2	U	C2:B		1	23	-	1414	2108:1969	1054+613	84.8 : 84.8%	-	-	-	6.5 (4.3+2.2)	16.6 (17.4:15.1)	12.9
2/3	A13 (south) Ahead	U	C2:B		1	23	-	896	2108	1054	85.0%	-	-	-	5.3	21.4	12.9
4/2+4/1	B1007 Left Ahead	O	-		-	-	-	113	1800:1800	474+270	15.2 : 15.2%	226	0	0	0.1 (0.1+0.0)	3.5 (3.6:3.4)	0.3
4/3	B1007 Ahead	O	-		-	-	-	633	1800	292	216.5%	292	0	0	183.1	1041.5	196.5

C1 - East Controller Stream: 1 PRC for Signalled Lanes (%): 19.8 Total Delay for Signalled Lanes (pcuHr): 11.14 Cycle Time (s): 48
C1 - East Controller Stream: 2 PRC for Signalled Lanes (%): 9.7 Total Delay for Signalled Lanes (pcuHr): 10.37 Cycle Time (s): 48
C2 - West Controller PRC for Signalled Lanes (%): 5.9 Total Delay for Signalled Lanes (pcuHr): 18.35 Cycle Time (s): 48
PRC Over All Lanes (%): -140.5 Total Delay Over All Lanes(pcuHr): 225.65

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E
A	0.0	27.1	56.6	0.0	63.6
B	58.9	0.0	16.5	21.7	48.1
C	51.4	66.5	0.0	23.6	37.6
D	0.0	47.4	0.0	0.0	20.1
E	8.4	26.6	1090.8	1094.6	0.0

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E
A	0.0	22.1	46.6	0.0	43.6
B	38.9	0.0	11.5	11.7	33.1
C	36.4	46.5	0.0	18.6	27.6
D	0.0	32.4	0.0	0.0	15.1
E	3.4	16.6	1075.8	1074.6	0.0

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 21: LTC AM DS
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	20.12
4	E	J2:4/3	D	J2:6/1	1095.84
5	E	J2:4/3	D	J2:6/1	1094.20
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	8.45
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	58.04
12	D	J2:2/3	B	J1:3/2	48.37
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	63.58
16	E	J2:4/2	B	J1:3/2	26.39
17	D	J2:2/3	B	J1:3/3	44.20
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	21.54
22	A	J1:2/2	B	J1:3/2	27.06
23	C	J1:8/2	A	J2:5/1	51.98
24	B	J1:5/2	A	J2:5/1	59.91
27	C	J1:8/2	B	J1:3/2	65.41
28	A	J1:2/2	B	J1:3/1	27.06
30	A	J1:2/2	B	J1:3/3	27.07
31	D	J2:2/2	B	J1:3/1	47.48
32	B	J1:5/2	E	J2:3/1	48.14
33	E	J2:4/2	B	J1:3/1	28.34
34	B	J1:5/2	D	J2:6/1	21.84
35	D	J2:2/3	C	J1:7/1	-
36	E	J2:4/3	C	J1:7/1	1090.84
37	A	J1:2/3	C	J1:7/1	56.62
38	B	J1:5/1	C	J1:7/1	16.54
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	50.79
43	C	J1:8/2	C	J1:7/1	-
44	C	J1:8/2	B	J1:3/3	-
45	C	J1:8/2	B	J1:3/1	67.20

Basic Results Summary

46	C	J1:8/2	E	J2:3/1	37.65
47	C	J1:8/2	D	J2:6/1	23.63

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 21: LTC AM DS
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	15.12
4	E	J2:4/3	D	J2:6/1	1075.84
5	E	J2:4/3	D	J2:6/1	1074.20
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	3.45
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	38.04
12	D	J2:2/3	B	J1:3/2	33.37
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	43.58
16	E	J2:4/2	B	J1:3/2	16.39
17	D	J2:2/3	B	J1:3/3	29.20
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	11.54
22	A	J1:2/2	B	J1:3/2	22.06
23	C	J1:8/2	A	J2:5/1	36.98
24	B	J1:5/2	A	J2:5/1	39.91
27	C	J1:8/2	B	J1:3/2	45.41
28	A	J1:2/2	B	J1:3/1	22.06
30	A	J1:2/2	B	J1:3/3	22.07
31	D	J2:2/2	B	J1:3/1	32.48
32	B	J1:5/2	E	J2:3/1	33.14
33	E	J2:4/2	B	J1:3/1	18.34
34	B	J1:5/2	D	J2:6/1	11.84
35	D	J2:2/3	C	J1:7/1	-
36	E	J2:4/3	C	J1:7/1	1075.84
37	A	J1:2/3	C	J1:7/1	46.62
38	B	J1:5/1	C	J1:7/1	11.54
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	35.79
43	C	J1:8/2	C	J1:7/1	-
44	C	J1:8/2	B	J1:3/3	-
45	C	J1:8/2	B	J1:3/1	47.20

Basic Results Summary

46	C	J1:8/2	E	J2:3/1	27.65
47	C	J1:8/2	D	J2:6/1	18.63

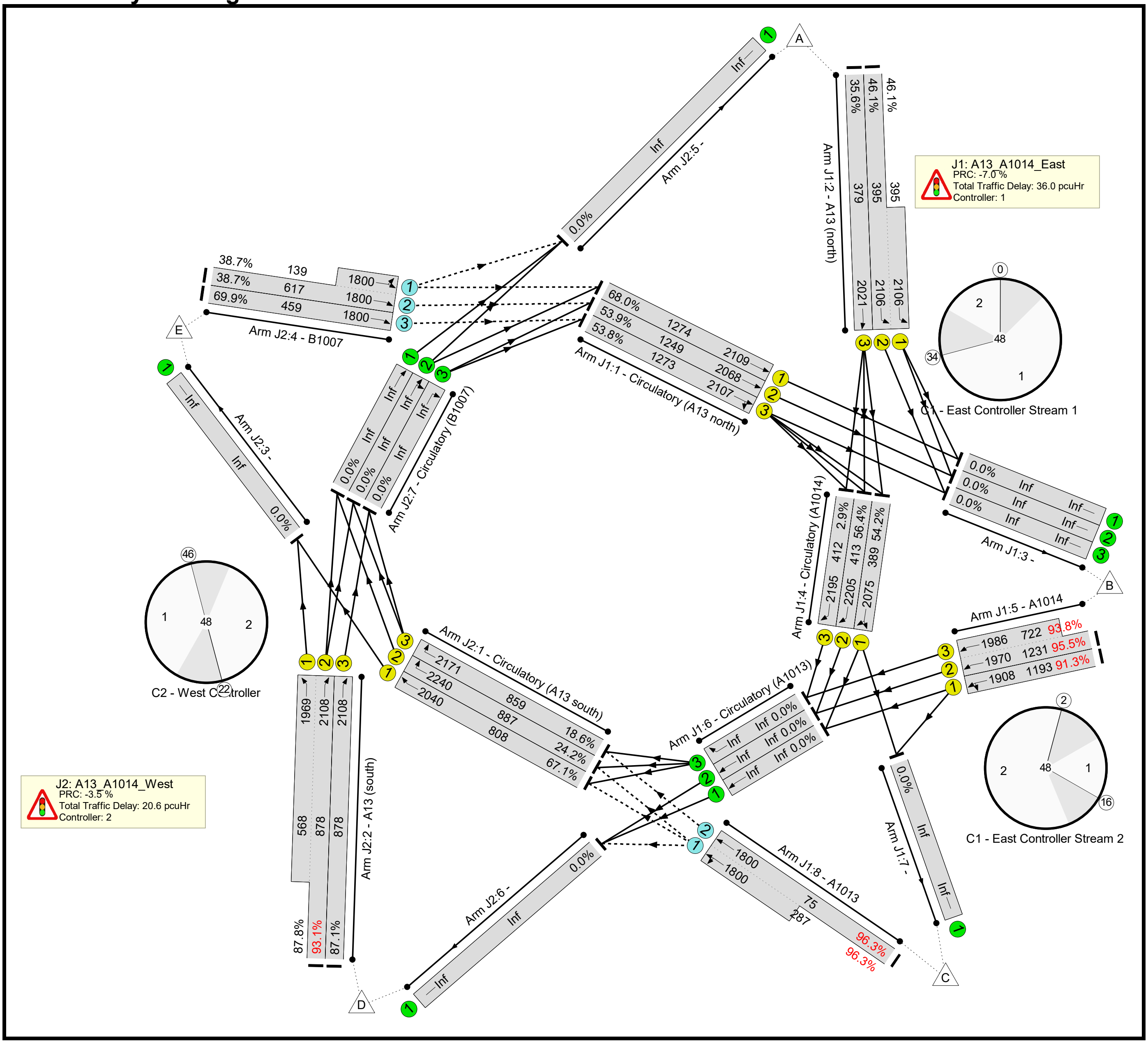
Traffic Flows, Actual

Actual Flow :

	Destination						
		A	B	C	D	E	Tot.
Origin	A	0	397	109	0	14	520
	B	532	0	37	1819	95	2483
	C	248	89	0	100	34	471
	D	0	1790	0	0	520	2310
	E	31	82	50	583	0	746
	Tot.	811	2358	196	2502	663	6530

Scenario 22: 'LTC PM DS' (FG20: 'LTC PM DS', 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: A13/A1014	-	-	-		-	-	-	-	-	-	**96.3%**	**1603**	**0**	**0**	**56.6**	-	-
J1: A13_A1014_East	-	-	-		-	-	-	-	-	-	**96.3%**	**696**	**0**	**0**	**36.0**	-	-
1/1	Circulatory (A13 north) Ahead	U	C1:A		1	28	-	866	2109	1274	68.0%	-	-	-	1.2	5.1	5.2
1/2	Circulatory (A13 north) Ahead	U	C1:A		1	28	-	673	2068	1249	53.9%	-	-	-	1.0	5.4	2.4
1/3	Circulatory (A13 north) Ahead Right	U	C1:A		1	28	-	685	2107	1273	53.8%	-	-	-	1.5	8.1	4.7
2/2+2/1	A13 (north) Left	U	C1:B		1	8	-	364	2106:2106	395+395	46.1 : 46.1%	-	-	-	2.2 (1.1+1.1)	21.6 (21.6:21.6)	2.5
2/3	A13 (north) Ahead	U	C1:B		1	8	-	135	2021	379	35.6%	-	-	-	0.9	24.4	1.8
4/1	Circulatory (A1014) Right Ahead	U	C1:C		1	8	-	211	2075	389	54.2%	-	-	-	1.2	20.2	2.6
4/2	Circulatory (A1014) Right	U	C1:C		1	8	-	233	2205	413	56.4%	-	-	-	1.3	19.5	1.6
4/3	Circulatory (A1014) Right	U	C1:C		1	8	-	12	2195	412	2.9%	-	-	-	0.0	13.6	0.2
5/1	A1014 Ahead Left	U	C1:D		1	29	-	1089	1908	1193	91.3%	-	-	-	7.2	23.8	17.2
5/2+5/3	A1014 Ahead	U	C1:D		1	29	-	1853	1970:1986	1231+722	95.5 : 93.8%	-	-	-	11.7 (7.8+3.9)	22.7 (23.9:20.6)	22.4
8/2+8/1	A1013 Ahead Left	O	-		-	-	-	348	1800:1800	75+287	96.3 : 96.3%	696	0	0	7.8 (1.6+6.2)	80.6 (78.0:81.3)	10.1
J2: A13_A1014_West	-	-	-		-	-	-	-	-	-	**93.1%**	**907**	**0**	**0**	**20.6**	-	-
1/1	Circulatory (A13 south) Ahead	U	C2:A		1	18	-	542	2040	808	67.1%	-	-	-	2.3	15.0	6.3

Basic Results Summary

1/2	Circulatory (A13 south) Right	U	C2:A		1	18	-	215	2240	887	24.2%	-	-	-	0.6	9.5	1.2
1/3	Circulatory (A13 south) Right	U	C2:A		1	18	-	160	2171	859	18.6%	-	-	-	0.5	10.9	1.4
2/2+2/1	A13 (south) Ahead Ahead2	U	C2:B		1	19	-	1317	2108:1969	878+568	93.1 : 87.8%	-	-	-	9.3 (6.0+3.3)	25.4 (26.3:23.9)	15.0
2/3	A13 (south) Ahead	U	C2:B		1	19	-	765	2108	878	87.1%	-	-	-	5.9	27.9	12.3
4/2+4/1	B1007 Left Ahead	O	-		-	-	-	293	1800:1800	617+139	38.7 : 38.7%	586	0	0	0.3 (0.3+0.1)	3.9 (3.9:3.9)	0.3
4/3	B1007 Ahead	O	-		-	-	-	321	1800	459	69.9%	321	0	0	1.7	19.5	4.3

C1 - East Controller Stream: 1 PRC for Signalled Lanes (%): 32.4 Total Delay for Signalled Lanes (pcuHr): 6.87 Cycle Time (s): 48
C1 - East Controller Stream: 2 PRC for Signalled Lanes (%): -6.1 Total Delay for Signalled Lanes (pcuHr): 21.37 Cycle Time (s): 48
C2 - West Controller PRC for Signalled Lanes (%): -3.5 Total Delay for Signalled Lanes (pcuHr): 18.51 Cycle Time (s): 48
PRC Over All Lanes (%): -7.0 Total Delay Over All Lanes(pcuHr): 56.59

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E
A	0.0	26.6	55.0	0.0	77.4
B	50.1	0.0	28.8	33.8	50.1
C	105.4	128.9	0.0	86.3	107.6
D	0.0	46.1	0.0	0.0	28.9
E	8.9	21.6	66.9	71.9	0.0

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E
A	0.0	21.6	45.0	0.0	57.4
B	30.1	0.0	23.8	23.8	35.1
C	90.4	108.9	0.0	81.3	97.6
D	0.0	31.1	0.0	0.0	23.9
E	3.9	11.6	51.9	51.9	0.0

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 22: LTC PM DS
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	28.90
4	E	J2:4/3	D	J2:6/1	71.95
5	E	J2:4/3	D	J2:6/1	71.85
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	8.88
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	50.19
12	D	J2:2/3	B	J1:3/2	46.25
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	77.39
16	E	J2:4/2	B	J1:3/2	21.50
17	D	J2:2/3	B	J1:3/3	46.20
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	33.77
22	A	J1:2/2	B	J1:3/2	26.59
23	C	J1:8/2	A	J2:5/1	105.32
24	B	J1:5/2	A	J2:5/1	50.05
27	C	J1:8/2	B	J1:3/2	128.44
28	A	J1:2/2	B	J1:3/1	26.59
30	A	J1:2/2	B	J1:3/3	26.59
31	D	J2:2/2	B	J1:3/1	46.05
32	B	J1:5/2	E	J2:3/1	50.08
33	E	J2:4/2	B	J1:3/1	22.28
34	B	J1:5/2	D	J2:6/1	33.88
35	D	J2:2/3	C	J1:7/1	-
36	E	J2:4/3	C	J1:7/1	66.95
37	A	J1:2/3	C	J1:7/1	55.03
38	B	J1:5/1	C	J1:7/1	28.77
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	105.63
43	C	J1:8/2	C	J1:7/1	-
44	C	J1:8/2	B	J1:3/3	129.24
45	C	J1:8/2	B	J1:3/1	129.24

Basic Results Summary

46	C	J1:8/2	E	J2:3/1	107.57
47	C	J1:8/2	D	J2:6/1	86.25

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 22: LTC PM DS
1	D	J2:2/3	D	J2:6/1	-
2	D	J2:2/3	D	J2:6/1	-
3	D	J2:2/2	E	J2:3/1	23.90
4	E	J2:4/3	D	J2:6/1	51.95
5	E	J2:4/3	D	J2:6/1	51.85
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	3.88
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	30.19
12	D	J2:2/3	B	J1:3/2	31.25
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	57.39
16	E	J2:4/2	B	J1:3/2	11.50
17	D	J2:2/3	B	J1:3/3	31.20
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	23.77
22	A	J1:2/2	B	J1:3/2	21.59
23	C	J1:8/2	A	J2:5/1	90.32
24	B	J1:5/2	A	J2:5/1	30.05
27	C	J1:8/2	B	J1:3/2	108.44
28	A	J1:2/2	B	J1:3/1	21.59
30	A	J1:2/2	B	J1:3/3	21.59
31	D	J2:2/2	B	J1:3/1	31.05
32	B	J1:5/2	E	J2:3/1	35.08
33	E	J2:4/2	B	J1:3/1	12.28
34	B	J1:5/2	D	J2:6/1	23.88
35	D	J2:2/3	C	J1:7/1	-
36	E	J2:4/3	C	J1:7/1	51.95
37	A	J1:2/3	C	J1:7/1	45.03
38	B	J1:5/1	C	J1:7/1	23.77
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	90.63
43	C	J1:8/2	C	J1:7/1	-
44	C	J1:8/2	B	J1:3/3	109.24
45	C	J1:8/2	B	J1:3/1	109.24

Basic Results Summary

46	C	J1:8/2	E	J2:3/1	97.57
47	C	J1:8/2	D	J2:6/1	81.25

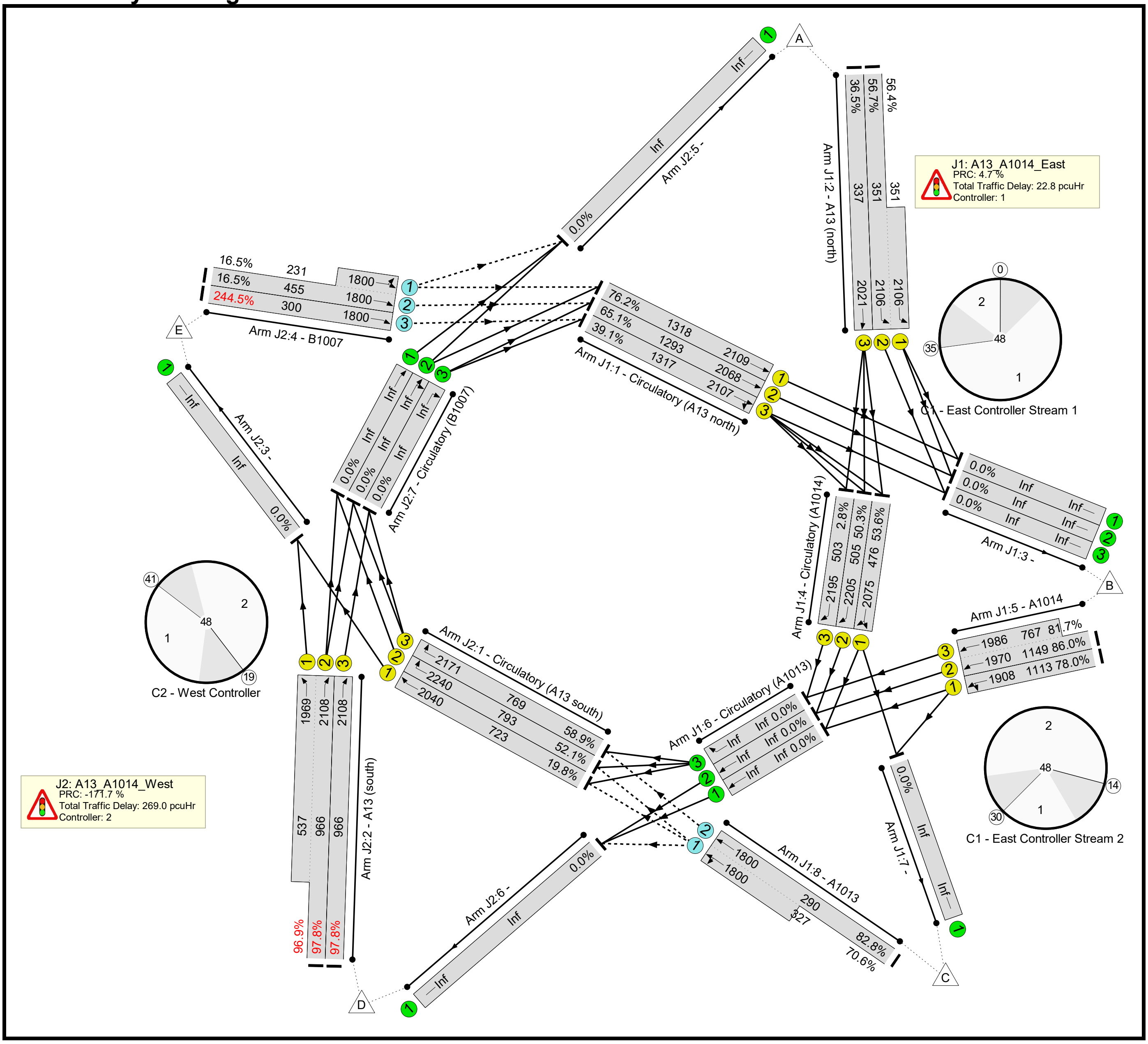
Traffic Flows, Actual

Actual Flow :

		Destination					
		A	B	C	D	E	Tot.
Origin	A	0	364	123	0	12	499
	B	271	0	79	2186	406	2942
	C	55	49	0	120	124	348
	D	0	1583	0	0	499	2082
	E	22	271	50	271	0	614
	Tot.	348	2267	252	2577	1041	6485

Scenario 23: 'Sensitivity AM DS' (FG23: 'Sensitivity LTC AM DS', 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: A13/A1014	-	-	-		-	-	-	-	-	-	**244.5%**	**1468**	**0**	**0**	**291.9**	-	-
J1: A13_A1014_East	-	-	-		-	-	-	-	-	-	**86.0%**	**942**	**0**	**0**	**22.8**	-	-
1/1	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	1004	2109	1318	76.2%	-	-	-	1.7	6.2	5.7
1/2	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	841	2068	1293	65.1%	-	-	-	1.1	4.7	1.8
1/3	Circulatory (A13 north) Ahead Right	U	C1:A		1	29	-	949	2107	1317	39.1%	-	-	-	0.7	5.0	3.9
2/2+2/1	A13 (north) Left	U	C1:B		1	7	-	397	2106:2106	351+351	56.7 : 56.4%	-	-	-	2.7 (1.3+1.3)	24.3 (24.3:24.3)	3.1
2/3	A13 (north) Ahead	U	C1:B		1	7	-	123	2021	337	36.5%	-	-	-	0.9	26.2	1.7
4/1	Circulatory (A1014) Right Ahead	U	C1:C		1	10	-	402	2075	476	53.6%	-	-	-	1.8	24.8	3.8
4/2	Circulatory (A1014) Right	U	C1:C		1	10	-	540	2205	505	50.3%	-	-	-	1.4	19.6	3.7
4/3	Circulatory (A1014) Right	U	C1:C		1	10	-	14	2195	503	2.8%	-	-	-	0.1	24.0	0.2
5/1	A1014 Ahead Left	U	C1:D		1	27	-	868	1908	1113	78.0%	-	-	-	3.6	14.9	10.4
5/2+5/3	A1014 Ahead	U	C1:D		1	27	-	1615	1970:1986	1149+767	86.0 : 81.7%	-	-	-	6.0 (3.9+2.1)	13.3 (14.2:12.0)	13.6
8/2+8/1	A1013 Ahead Left	O	-		-	-	-	471	1800:1800	290+327	82.8 : 70.6%	942	0	0	2.9 (1.6+1.3)	22.2 (23.6:20.7)	4.5
J2: A13_A1014_West	-	-	-		-	-	-	-	-	-	**244.5%**	**526**	**0**	**0**	**269.0**	-	-

Basic Results Summary

1/1	Circulatory (A13 south) Ahead	U	C2:A		1	16	-	143	2040	723	19.8%	-	-	-	0.6	16.4	1.5
1/2	Circulatory (A13 south) Right	U	C2:A		1	16	-	416	2240	793	52.1%	-	-	-	2.7	23.6	5.9
1/3	Circulatory (A13 south) Right	U	C2:A		1	16	-	453	2171	769	58.9%	-	-	-	2.4	18.8	5.6
2/2+2/1	A13 (south) Ahead Ahead2	U	C2:B		1	21	-	1465	2108:1969	966+537	97.8 : 96.9%	-	-	-	16.6 (11.0+5.6)	40.8 (41.9:38.8)	24.2
2/3	A13 (south) Ahead	U	C2:B		1	21	-	945	2108	966	97.8%	-	-	-	14.3	54.5	23.3
4/2+4/1	B1007 Left Ahead	O	-		-	-	-	113	1800:1800	455+231	16.5 : 16.5%	226	0	0	0.1 (0.1+0.0)	3.8 (3.9:3.7)	0.3
4/3	B1007 Ahead	O	-		-	-	-	733	1800	300	244.5%	300	0	0	232.3	1140.8	245.6

C1 - East Controller Stream: 1 PRC for Signalled Lanes (%): 18.2 Total Delay for Signalled Lanes (pcuHr): 7.11 Cycle Time (s): 48
C1 - East Controller Stream: 2 PRC for Signalled Lanes (%): 4.7 Total Delay for Signalled Lanes (pcuHr): 12.81 Cycle Time (s): 48
C2 - West Controller PRC for Signalled Lanes (%): -8.7 Total Delay for Signalled Lanes (pcuHr): 36.65 Cycle Time (s): 48
PRC Over All Lanes (%): -171.7 Total Delay Over All Lanes(pcuHr): 291.86

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E
A	0.0	29.3	66.1	0.0	73.4
B	57.9	0.0	19.9	24.5	48.4
C	51.3	69.9	0.0	25.7	38.2
D	0.0	67.7	0.0	99.7	43.8
E	8.7	21.0	1184.6	1188.2	0.0

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E
A	0.0	24.3	56.1	0.0	53.4
B	37.9	0.0	14.9	14.5	33.4
C	36.3	49.9	0.0	20.7	28.2
D	0.0	52.7	0.0	74.7	38.8
E	3.7	11.0	1169.6	1168.2	0.0

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 23: Sensitivity AM DS
1	D	J2:2/3	D	J2:6/1	100.43
2	D	J2:2/3	D	J2:6/1	99.12
3	D	J2:2/2	E	J2:3/1	43.76
4	E	J2:4/3	D	J2:6/1	1189.60
5	E	J2:4/3	D	J2:6/1	1187.65
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	8.72
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	57.77
12	D	J2:2/3	B	J1:3/2	73.57
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	73.39
16	E	J2:4/2	B	J1:3/2	20.83
17	D	J2:2/3	B	J1:3/3	72.10
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	24.89
22	A	J1:2/2	B	J1:3/2	29.29
23	C	J1:8/2	A	J2:5/1	51.97
24	B	J1:5/2	A	J2:5/1	58.00
27	C	J1:8/2	B	J1:3/2	68.94
28	A	J1:2/2	B	J1:3/1	29.29
30	A	J1:2/2	B	J1:3/3	29.30
31	D	J2:2/2	B	J1:3/1	62.69
32	B	J1:5/2	E	J2:3/1	48.44
33	E	J2:4/2	B	J1:3/1	22.49
34	B	J1:5/2	D	J2:6/1	24.23
35	D	J2:2/3	C	J1:7/1	-
36	E	J2:4/3	C	J1:7/1	1184.60
37	A	J1:2/3	C	J1:7/1	66.08
38	B	J1:5/1	C	J1:7/1	19.89
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	50.93
43	C	J1:8/2	C	J1:7/1	-
44	C	J1:8/2	B	J1:3/3	68.47

Basic Results Summary

45	C	J1:8/2	B	J1:3/1	70.57
46	C	J1:8/2	E	J2:3/1	38.18
47	C	J1:8/2	D	J2:6/1	25.72

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 23: Sensitivity AM DS
1	D	J2:2/3	D	J2:6/1	75.43
2	D	J2:2/3	D	J2:6/1	74.12
3	D	J2:2/2	E	J2:3/1	38.76
4	E	J2:4/3	D	J2:6/1	1169.60
5	E	J2:4/3	D	J2:6/1	1167.65
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	3.72
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	37.77
12	D	J2:2/3	B	J1:3/2	58.57
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	53.39
16	E	J2:4/2	B	J1:3/2	10.83
17	D	J2:2/3	B	J1:3/3	57.10
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	14.89
22	A	J1:2/2	B	J1:3/2	24.29
23	C	J1:8/2	A	J2:5/1	36.97
24	B	J1:5/2	A	J2:5/1	38.00
27	C	J1:8/2	B	J1:3/2	48.94
28	A	J1:2/2	B	J1:3/1	24.29
30	A	J1:2/2	B	J1:3/3	24.30
31	D	J2:2/2	B	J1:3/1	47.69
32	B	J1:5/2	E	J2:3/1	33.44
33	E	J2:4/2	B	J1:3/1	12.49
34	B	J1:5/2	D	J2:6/1	14.23
35	D	J2:2/3	C	J1:7/1	-
36	E	J2:4/3	C	J1:7/1	1169.60
37	A	J1:2/3	C	J1:7/1	56.08
38	B	J1:5/1	C	J1:7/1	14.89
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	35.93
43	C	J1:8/2	C	J1:7/1	-
44	C	J1:8/2	B	J1:3/3	48.47

Basic Results Summary

45	C	J1:8/2	B	J1:3/1	50.57
46	C	J1:8/2	E	J2:3/1	28.18
47	C	J1:8/2	D	J2:6/1	20.72

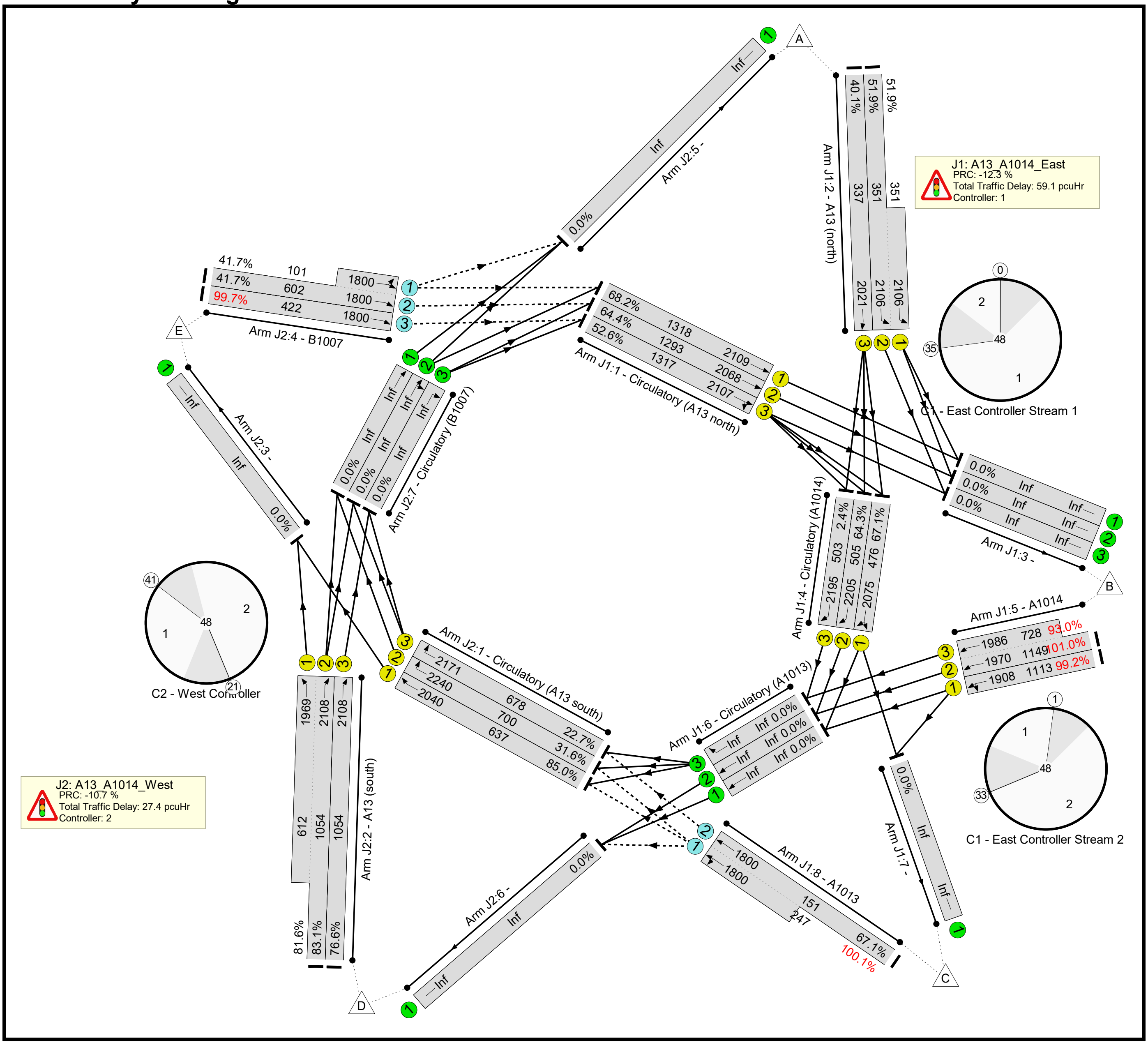
Traffic Flows, Actual

Actual Flow :

	Destination						
		A	B	C	D	E	Tot.
Origin	A	0	397	109	0	14	520
	B	532	0	37	1819	95	2483
	C	248	89	0	100	34	471
	D	0	1790	0	100	520	2410
	E	31	82	50	683	0	846
	Tot.	811	2358	196	2702	663	6730

Scenario 24: 'Sensitivity PM DS' (FG24: 'Senstivityi LTC PM DS', 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: A13/A1014	-	-	-		-	-	-	-	-	-	**101.0%**	**1702**	**0**	**0**	**86.5**	-	-
J1: A13_A1014_East	-	-	-		-	-	-	-	-	-	**101.0%**	**695**	**0**	**0**	**59.1**	-	-
1/1	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	899	2109	1318	68.2%	-	-	-	1.1	4.5	4.0
1/2	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	832	2068	1293	64.4%	-	-	-	1.2	5.3	3.3
1/3	Circulatory (A13 north) Ahead Right	U	C1:A		1	29	-	693	2107	1317	52.6%	-	-	-	1.7	8.8	6.6
2/2+2/1	A13 (north) Left	U	C1:B		1	7	-	364	2106:2106	351+351	51.9 : 51.9%	-	-	-	2.4 (1.2+1.2)	23.6 (23.6:23.6)	2.7
2/3	A13 (north) Ahead	U	C1:B		1	7	-	135	2021	337	40.1%	-	-	-	1.0	26.8	1.9
4/1	Circulatory (A1014) Right Ahead	U	C1:C		1	10	-	319	2075	476	67.1%	-	-	-	2.3	26.0	3.9
4/2	Circulatory (A1014) Right	U	C1:C		1	10	-	325	2205	505	64.3%	-	-	-	2.8	31.2	5.2
4/3	Circulatory (A1014) Right	U	C1:C		1	10	-	12	2195	503	2.4%	-	-	-	0.0	10.5	0.0
5/1	A1014 Ahead Left	U	C1:D		1	27	-	1104	1908	1113	99.2%	-	-	-	17.5	57.2	28.9
5/2+5/3	A1014 Ahead	U	C1:D		1	27	-	1838	1970:1986	1149+728	101.0 : 93.0%	-	-	-	24.4 (18.1+6.3)	47.8 (56.1:33.4)	35.4
8/2+8/1	A1013 Ahead Left	O	-		-	-	-	348	1800:1800	151+247	67.1 : 100.1%	695	0	0	4.6 (1.2+3.4)	47.3 (42.1:49.4)	12.2
J2: A13_A1014_West	-	-	-		-	-	-	-	-	-	**99.7%**	**1007**	**0**	**0**	**27.4**	-	-

Basic Results Summary

1/1	Circulatory (A13 south) Ahead	U	C2:A		1	14	-	542	2040	637	85.0%	-	-	-	4.6	30.7	9.6
1/2	Circulatory (A13 south) Right	U	C2:A		1	14	-	221	2240	700	31.6%	-	-	-	0.6	10.2	2.4
1/3	Circulatory (A13 south) Right	U	C2:A		1	14	-	154	2171	678	22.7%	-	-	-	0.9	21.6	2.0
2/2+2/1	A13 (south) Ahead Ahead2	U	C2:B		1	23	-	1375	2108:1969	1054+612	83.1 : 81.6%	-	-	-	5.9 (4.0+2.0)	15.6 (16.4:14.1)	12.3
2/3	A13 (south) Ahead	U	C2:B		1	23	-	807	2108	1054	76.6%	-	-	-	3.8	16.9	10.1
4/2+4/1	B1007 Left Ahead	O	-		-	-	-	293	1800:1800	602+101	41.7 : 41.7%	586	0	0	0.4 (0.3+0.1)	4.4 (4.4:4.4)	0.6
4/3	B1007 Ahead	O	-		-	-	-	421	1800	422	99.7%	421	0	0	11.1	95.2	15.4

C1 - East Controller Stream: 1 PRC for Signalled Lanes (%): 32.0 Total Delay for Signalled Lanes (pcuHr): 7.43 Cycle Time (s): 48
C1 - East Controller Stream: 2 PRC for Signalled Lanes (%): -12.3 Total Delay for Signalled Lanes (pcuHr): 47.09 Cycle Time (s): 48
C2 - West Controller PRC for Signalled Lanes (%): 5.9 Total Delay for Signalled Lanes (pcuHr): 15.91 Cycle Time (s): 48
PRC Over All Lanes (%): -12.3 Total Delay Over All Lanes(pcuHr): 86.49

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E
A	0.0	28.6	54.9	0.0	95.3
B	63.5	0.0	62.2	66.7	76.7
C	84.8	107.5	0.0	54.4	97.3
D	0.0	35.9	0.0	75.1	19.1
E	9.4	22.2	152.7	157.3	0.0

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E
A	0.0	23.6	44.9	0.0	75.3
B	43.5	0.0	57.2	56.7	61.7
C	69.8	87.5	0.0	49.4	87.3
D	0.0	20.9	0.0	50.1	14.1
E	4.4	12.2	137.7	137.3	0.0

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 24: Sensitivity PM DS
1	D	J2:2/3	D	J2:6/1	75.04
2	D	J2:2/3	D	J2:6/1	75.15
3	D	J2:2/2	E	J2:3/1	19.13
4	E	J2:4/3	D	J2:6/1	157.71
5	E	J2:4/3	D	J2:6/1	157.20
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	9.40
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	63.45
12	D	J2:2/3	B	J1:3/2	35.98
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	95.33
16	E	J2:4/2	B	J1:3/2	22.24
17	D	J2:2/3	B	J1:3/3	36.13
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	67.22
22	A	J1:2/2	B	J1:3/2	28.57
23	C	J1:8/2	A	J2:5/1	86.35
24	B	J1:5/2	A	J2:5/1	63.60
27	C	J1:8/2	B	J1:3/2	107.78
28	A	J1:2/2	B	J1:3/1	28.57
30	A	J1:2/2	B	J1:3/3	28.57
31	D	J2:2/2	B	J1:3/1	35.72
32	B	J1:5/2	E	J2:3/1	76.66
33	E	J2:4/2	B	J1:3/1	22.22
34	B	J1:5/2	D	J2:6/1	66.15
35	D	J2:2/3	C	J1:7/1	-
36	E	J2:4/3	C	J1:7/1	152.71
37	A	J1:2/3	C	J1:7/1	54.93
38	B	J1:5/1	C	J1:7/1	62.22
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	84.70
43	C	J1:8/2	C	J1:7/1	-
44	C	J1:8/2	B	J1:3/3	107.45

Basic Results Summary

45	C	J1:8/2	B	J1:3/1	108.07
46	C	J1:8/2	E	J2:3/1	97.26
47	C	J1:8/2	D	J2:6/1	54.36

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 24: Sensitivity PM DS
1	D	J2:2/3	D	J2:6/1	50.04
2	D	J2:2/3	D	J2:6/1	50.15
3	D	J2:2/2	E	J2:3/1	14.13
4	E	J2:4/3	D	J2:6/1	137.71
5	E	J2:4/3	D	J2:6/1	137.20
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	4.40
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	43.45
12	D	J2:2/3	B	J1:3/2	20.98
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	75.33
16	E	J2:4/2	B	J1:3/2	12.24
17	D	J2:2/3	B	J1:3/3	21.13
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	57.22
22	A	J1:2/2	B	J1:3/2	23.57
23	C	J1:8/2	A	J2:5/1	71.35
24	B	J1:5/2	A	J2:5/1	43.60
27	C	J1:8/2	B	J1:3/2	87.78
28	A	J1:2/2	B	J1:3/1	23.57
30	A	J1:2/2	B	J1:3/3	23.57
31	D	J2:2/2	B	J1:3/1	20.72
32	B	J1:5/2	E	J2:3/1	61.66
33	E	J2:4/2	B	J1:3/1	12.22
34	B	J1:5/2	D	J2:6/1	56.15
35	D	J2:2/3	C	J1:7/1	-
36	E	J2:4/3	C	J1:7/1	137.71
37	A	J1:2/3	C	J1:7/1	44.93
38	B	J1:5/1	C	J1:7/1	57.22
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	69.70
43	C	J1:8/2	C	J1:7/1	-
44	C	J1:8/2	B	J1:3/3	87.45

Basic Results Summary

45	C	J1:8/2	B	J1:3/1	88.07
46	C	J1:8/2	E	J2:3/1	87.26
47	C	J1:8/2	D	J2:6/1	49.36

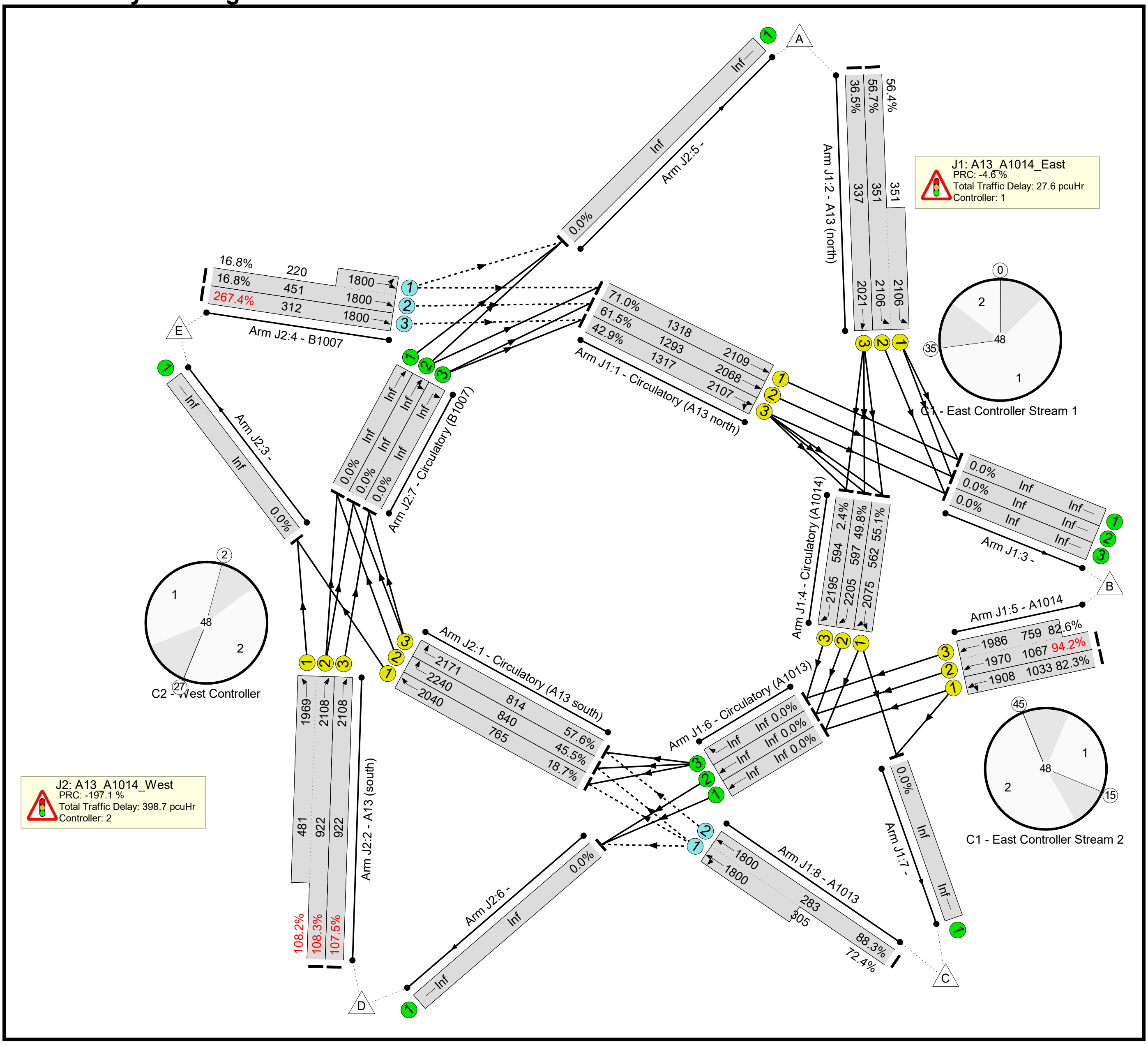
Traffic Flows, Actual

Actual Flow :

	Destination						
		A	B	C	D	E	Tot.
Origin	A	0	364	123	0	12	499
	B	271	0	79	2186	406	2942
	C	55	49	0	120	124	348
	D	0	1583	0	100	499	2182
	E	22	271	50	371	0	714
	Tot.	348	2267	252	2777	1041	6685

Scenario 25: 'DCC AM DS' (FG25: 'Dartford Closure LTC AM DS', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

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: A13/A1014	-	-	-		-	-	-	-	-	-	**267.4%**	**1480**	**0**	**0**	**426.3**	-	-
J1: A13_A1014_East	-	-	-		-	-	-	-	-	-	**94.2%**	**942**	**0**	**0**	**27.6**	-	-
1/1	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	1012	2109	1318	71.0%	-	-	-	1.8	7.0	5.3
1/2	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	849	2068	1293	61.5%	-	-	-	1.3	6.0	2.5
1/3	Circulatory (A13 north) Ahead Right	U	C1:A		1	29	-	1133	2107	1317	42.9%	-	-	-	1.0	6.2	3.6
2/2+2/1	A13 (north) Left	U	C1:B		1	7	-	397	2106:2106	351+351	56.7 : 56.4%	-	-	-	2.7 (1.3+1.3)	24.3 (24.3:24.3)	3.1
2/3	A13 (north) Ahead	U	C1:B		1	7	-	123	2021	337	36.5%	-	-	-	0.9	26.2	1.7
4/1	Circulatory (A1014) Right Ahead	U	C1:C		1	12	-	520	2075	562	55.1%	-	-	-	1.8	21.5	3.9
4/2	Circulatory (A1014) Right	U	C1:C		1	12	-	622	2205	597	49.8%	-	-	-	2.0	24.7	3.2
4/3	Circulatory (A1014) Right	U	C1:C		1	12	-	14	2195	594	2.4%	-	-	-	0.0	6.6	0.2
5/1	A1014 Ahead Left	U	C1:D		1	25	-	851	1908	1033	82.3%	-	-	-	4.4	18.7	11.5
5/2+5/3	A1014 Ahead	U	C1:D		1	25	-	1632	1970:1986	1067+759	94.2 : 82.6%	-	-	-	8.2 (5.4+2.8)	18.1 (19.2:16.3)	16.3
8/2+8/1	A1013 Ahead Left	O	-		-	-	-	471	1800:1800	283+305	88.3 : 72.4%	942	0	0	3.4 (1.9+1.5)	25.6 (26.8:24.3)	5.1
J2: A13_A1014_West	-	-	-		-	-	-	-	-	-	**267.4%**	**538**	**0**	**0**	**398.7**	-	-

Basic Results Summary

1/1	Circulatory (A13 south) Ahead	U	C2:A		1	17	-	143	2040	765	18.7%	-	-	-	0.4	11.2	1.3
1/2	Circulatory (A13 south) Right	U	C2:A		1	17	-	400	2240	840	45.5%	-	-	-	1.1	10.7	3.8
1/3	Circulatory (A13 south) Right	U	C2:A		1	17	-	469	2171	814	57.6%	-	-	-	2.2	17.0	6.3
2/2+2/1	A13 (south) Ahead Ahead2	U	C2:B		1	20	-	1519	2108:1969	922+481	108.3 : 108.2%	-	-	-	70.9 (47.7+23.2)	167.9 (171.8:160.5)	78.3
2/3	A13 (south) Ahead	U	C2:B		1	20	-	991	2108	922	107.5%	-	-	-	45.7	165.9	54.6
4/2+4/1	B1007 Left Ahead	O	-		-	-	-	113	1800:1800	451+220	16.8 : 16.8%	226	0	0	0.1 (0.1+0.0)	3.8 (3.9:3.8)	0.3
4/3	B1007 Ahead	O	-		-	-	-	833	1800	312	267.4%	312	0	0	278.3	1202.7	294.9

C1 - East Controller Stream: 1 PRC for Signalled Lanes (%): 26.8 Total Delay for Signalled Lanes (pcuHr): 7.69 Cycle Time (s): 48
C1 - East Controller Stream: 2 PRC for Signalled Lanes (%): -4.6 Total Delay for Signalled Lanes (pcuHr): 16.53 Cycle Time (s): 48
C2 - West Controller PRC for Signalled Lanes (%): -20.4 Total Delay for Signalled Lanes (pcuHr): 120.32 Cycle Time (s): 48
PRC Over All Lanes (%): -197.1 Total Delay Over All Lanes(pcuHr): 426.31

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E
A	0.0	29.3	50.6	0.0	74.8
B	46.2	0.0	23.7	29.0	38.1
C	61.9	81.3	0.0	29.3	53.3
D	0.0	190.6	0.0	221.0	165.5
E	8.8	21.2	1249.2	1253.6	0.0

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E
A	0.0	24.3	40.6	0.0	54.8
B	26.2	0.0	18.7	19.0	23.1
C	46.9	61.3	0.0	24.3	43.3
D	0.0	175.6	0.0	196.0	160.5
E	3.8	11.2	1234.2	1233.6	0.0

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 25: DCC AM DS
1	D	J2:2/3	D	J2:6/1	221.18
2	D	J2:2/3	D	J2:6/1	220.90
3	D	J2:2/2	E	J2:3/1	165.53
4	E	J2:4/3	D	J2:6/1	1254.15
5	E	J2:4/3	D	J2:6/1	1253.25
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	8.77
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	44.86
12	D	J2:2/3	B	J1:3/2	186.77
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	74.77
16	E	J2:4/2	B	J1:3/2	21.11
17	D	J2:2/3	B	J1:3/3	185.48
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	28.73
22	A	J1:2/2	B	J1:3/2	29.29
23	C	J1:8/2	A	J2:5/1	59.26
24	B	J1:5/2	A	J2:5/1	48.11
27	C	J1:8/2	B	J1:3/2	-
28	A	J1:2/2	B	J1:3/1	29.29
30	A	J1:2/2	B	J1:3/3	29.30
31	D	J2:2/2	B	J1:3/1	193.70
32	B	J1:5/2	E	J2:3/1	38.09
33	E	J2:4/2	B	J1:3/1	22.34
34	B	J1:5/2	D	J2:6/1	29.19
35	D	J2:2/3	C	J1:7/1	-
36	E	J2:4/3	C	J1:7/1	1249.15
37	A	J1:2/3	C	J1:7/1	50.57
38	B	J1:5/1	C	J1:7/1	23.73
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	63.29
43	C	J1:8/2	C	J1:7/1	-
44	C	J1:8/2	B	J1:3/3	81.16
45	C	J1:8/2	B	J1:3/1	82.34

Basic Results Summary

46	C	J1:8/2	E	J2:3/1	53.29
47	C	J1:8/2	D	J2:6/1	29.32

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 25: DCC AM DS
1	D	J2:2/3	D	J2:6/1	196.18
2	D	J2:2/3	D	J2:6/1	195.90
3	D	J2:2/2	E	J2:3/1	160.53
4	E	J2:4/3	D	J2:6/1	1234.15
5	E	J2:4/3	D	J2:6/1	1233.25
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	3.77
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	24.86
12	D	J2:2/3	B	J1:3/2	171.77
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	54.77
16	E	J2:4/2	B	J1:3/2	11.11
17	D	J2:2/3	B	J1:3/3	170.48
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	18.73
22	A	J1:2/2	B	J1:3/2	24.29
23	C	J1:8/2	A	J2:5/1	44.26
24	B	J1:5/2	A	J2:5/1	28.11
27	C	J1:8/2	B	J1:3/2	-
28	A	J1:2/2	B	J1:3/1	24.29
30	A	J1:2/2	B	J1:3/3	24.30
31	D	J2:2/2	B	J1:3/1	178.70
32	B	J1:5/2	E	J2:3/1	23.09
33	E	J2:4/2	B	J1:3/1	12.34
34	B	J1:5/2	D	J2:6/1	19.19
35	D	J2:2/3	C	J1:7/1	-
36	E	J2:4/3	C	J1:7/1	1234.15
37	A	J1:2/3	C	J1:7/1	40.57
38	B	J1:5/1	C	J1:7/1	18.73
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	48.29
43	C	J1:8/2	C	J1:7/1	-
44	C	J1:8/2	B	J1:3/3	61.16
45	C	J1:8/2	B	J1:3/1	62.34

Basic Results Summary

46	C	J1:8/2	E	J2:3/1	43.29
47	C	J1:8/2	D	J2:6/1	24.32

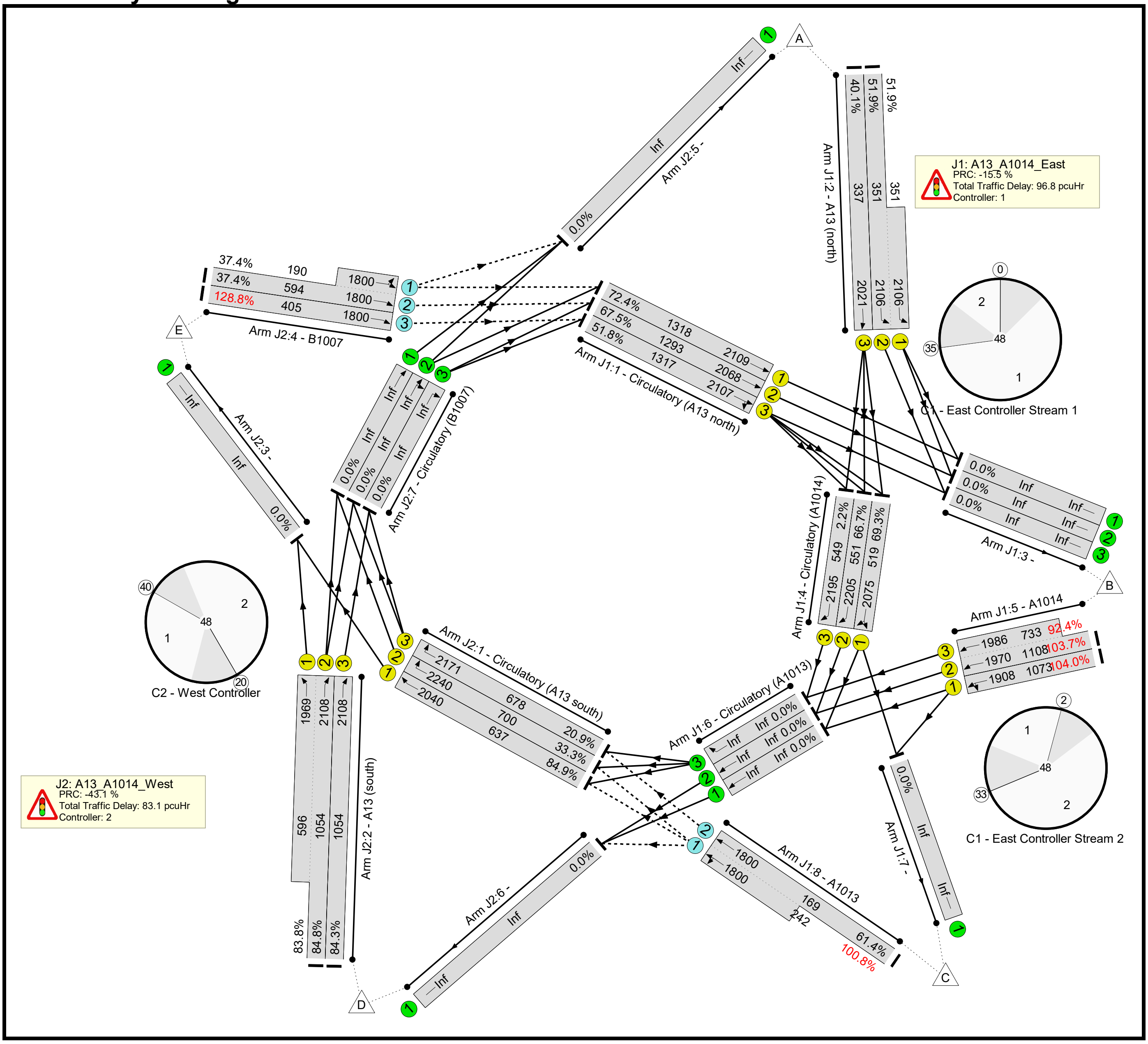
Traffic Flows, Actual

Actual Flow :

	Destination						
		A	B	C	D	E	Tot.
Origin	A	0	397	109	0	14	520
	B	532	0	37	1819	95	2483
	C	248	89	0	100	34	471
	D	0	1790	0	200	520	2510
	E	31	82	50	783	0	946
	Tot.	811	2358	196	2902	663	6930

Scenario 26: 'DCC PM DS' (FG26: 'Dartford Closure LTC PM DS', 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: A13/A1014	-	-	-		-	-	-	-	-	-	**128.8%**	**1683**	**0**	**0**	**179.9**	-	-
J1: A13_A1014_East	-	-	-		-	-	-	-	-	-	**104.0%**	**692**	**0**	**0**	**96.8**	-	-
1/1	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	954	2109	1318	72.4%	-	-	-	1.4	5.3	6.1
1/2	Circulatory (A13 north) Ahead	U	C1:A		1	29	-	872	2068	1293	67.5%	-	-	-	1.4	5.6	4.5
1/3	Circulatory (A13 north) Ahead Right	U	C1:A		1	29	-	798	2107	1317	51.8%	-	-	-	1.5	8.1	6.1
2/2+2/1	A13 (north) Left	U	C1:B		1	7	-	364	2106:2106	351+351	51.9 : 51.9%	-	-	-	2.4 (1.2+1.2)	23.6 (23.6:23.6)	2.7
2/3	A13 (north) Ahead	U	C1:B		1	7	-	135	2021	337	40.1%	-	-	-	1.0	26.8	1.9
4/1	Circulatory (A1014) Right Ahead	U	C1:C		1	11	-	404	2075	519	69.3%	-	-	-	2.6	25.9	4.5
4/2	Circulatory (A1014) Right	U	C1:C		1	11	-	440	2205	551	66.7%	-	-	-	3.1	30.7	5.9
4/3	Circulatory (A1014) Right	U	C1:C		1	11	-	12	2195	549	2.2%	-	-	-	0.0	7.8	0.0
5/1	A1014 Ahead Left	U	C1:D		1	26	-	1116	1908	1073	104.0%	-	-	-	34.7	111.8	46.0
5/2+5/3	A1014 Ahead	U	C1:D		1	26	-	1826	1970:1986	1108+733	103.7 : 92.4%	-	-	-	43.9 (36.0+8.0)	86.6 (112.7:42.5)	54.3
8/2+8/1	A1013 Ahead Left	O	-		-	-	-	348	1800:1800	169+242	61.4 : 100.8%	692	0	0	4.8 (1.0+3.7)	49.1 (35.6:54.9)	12.2
J2: A13_A1014_West	-	-	-		-	-	-	-	-	-	**128.8%**	**991**	**0**	**0**	**83.1**	-	-

Basic Results Summary

1/1	Circulatory (A13 south) Ahead	U	C2:A		1	14	-	542	2040	637	84.9%	-	-	-	4.5	29.6	9.5
1/2	Circulatory (A13 south) Right	U	C2:A		1	14	-	233	2240	700	33.3%	-	-	-	0.6	9.6	2.5
1/3	Circulatory (A13 south) Right	U	C2:A		1	14	-	142	2171	678	20.9%	-	-	-	0.8	21.5	1.9
2/2+2/1	A13 (south) Ahead Ahead2	U	C2:B		1	23	-	1393	2108:1969	1054+596	84.8 : 83.8%	-	-	-	6.4 (4.3+2.1)	16.4 (17.3:14.9)	12.8
2/3	A13 (south) Ahead	U	C2:B		1	23	-	889	2108	1054	84.3%	-	-	-	5.2	21.0	12.7
4/2+4/1	B1007 Left Ahead	O	-		-	-	-	293	1800:1800	594+190	37.4 : 37.4%	586	0	0	0.3 (0.2+0.1)	3.7 (3.7:3.7)	0.5
4/3	B1007 Ahead	O	-		-	-	-	521	1800	405	128.8%	405	0	0	65.4	451.7	80.5

C1 - East Controller Stream: 1 PRC for Signalled Lanes (%): 24.4 Total Delay for Signalled Lanes (pcuHr): 7.69 Cycle Time (s): 48
C1 - East Controller Stream: 2 PRC for Signalled Lanes (%): -15.5 Total Delay for Signalled Lanes (pcuHr): 84.35 Cycle Time (s): 48
C2 - West Controller PRC for Signalled Lanes (%): 6.0 Total Delay for Signalled Lanes (pcuHr): 17.46 Cycle Time (s): 48
PRC Over All Lanes (%): -43.1 Total Delay Over All Lanes(pcuHr): 179.91

Basic Results Summary

Travel Time Matrix, Journey Time

Journey Time :

	A	B	C	D	E
A	0.0	28.6	52.4	0.0	91.0
B	72.1	0.0	116.8	122.2	84.9
C	76.5	97.4	0.0	59.9	101.1
D	0.0	38.7	0.0	79.4	19.9
E	8.7	21.9	508.9	513.4	0.0

Travel Time Matrix, Delay Per PCU

Delay Per PCU :

	A	B	C	D	E
A	0.0	23.6	42.4	0.0	71.0
B	52.1	0.0	111.8	112.2	69.9
C	61.5	77.4	0.0	54.9	91.1
D	0.0	23.7	0.0	54.4	14.9
E	3.7	11.9	493.9	493.4	0.0

Basic Results Summary

Traffic Route Journey Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 26: DCC PM DS
1	D	J2:2/3	D	J2:6/1	79.48
2	D	J2:2/3	D	J2:6/1	79.37
3	D	J2:2/2	E	J2:3/1	19.91
4	E	J2:4/3	D	J2:6/1	513.88
5	E	J2:4/3	D	J2:6/1	513.18
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	8.69
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	72.09
12	D	J2:2/3	B	J1:3/2	40.46
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	90.98
16	E	J2:4/2	B	J1:3/2	21.89
17	D	J2:2/3	B	J1:3/3	40.03
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	121.78
22	A	J1:2/2	B	J1:3/2	28.57
23	C	J1:8/2	A	J2:5/1	-
24	B	J1:5/2	A	J2:5/1	71.92
27	C	J1:8/2	B	J1:3/2	97.83
28	A	J1:2/2	B	J1:3/1	28.57
30	A	J1:2/2	B	J1:3/3	28.57
31	D	J2:2/2	B	J1:3/1	37.31
32	B	J1:5/2	E	J2:3/1	84.90
33	E	J2:4/2	B	J1:3/1	22.16
34	B	J1:5/2	D	J2:6/1	122.66
35	D	J2:2/3	C	J1:7/1	-
36	E	J2:4/3	C	J1:7/1	508.88
37	A	J1:2/3	C	J1:7/1	52.40
38	B	J1:5/1	C	J1:7/1	116.78
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	76.48
43	C	J1:8/2	C	J1:7/1	-
44	C	J1:8/2	B	J1:3/3	96.61
45	C	J1:8/2	B	J1:3/1	98.42

Basic Results Summary

46	C	J1:8/2	E	J2:3/1	101.10
47	C	J1:8/2	D	J2:6/1	59.94

Basic Results Summary

Traffic Route Delay Times

Route Num	Org Zone	Org Lane	Dest Zone	Dest Lane	Scenario 26: DCC PM DS
1	D	J2:2/3	D	J2:6/1	54.48
2	D	J2:2/3	D	J2:6/1	54.37
3	D	J2:2/2	E	J2:3/1	14.91
4	E	J2:4/3	D	J2:6/1	493.88
5	E	J2:4/3	D	J2:6/1	493.18
6	D	J2:2/2	A	J2:5/1	-
7	D	J2:2/2	A	J2:5/1	-
8	E	J2:4/2	A	J2:5/1	3.69
9	A	J1:2/3	D	J2:6/1	-
10	A	J1:2/3	A	J2:5/1	-
11	B	J1:5/2	A	J2:5/1	52.09
12	D	J2:2/3	B	J1:3/2	25.46
13	A	J1:2/3	D	J2:6/1	-
14	A	J1:2/3	A	J2:5/1	-
15	A	J1:2/3	E	J2:3/1	70.98
16	E	J2:4/2	B	J1:3/2	11.89
17	D	J2:2/3	B	J1:3/3	25.03
18	E	J2:4/3	B	J1:3/3	-
19	B	J1:5/2	B	J1:3/2	-
20	B	J1:5/2	B	J1:3/3	-
21	B	J1:5/1	D	J2:6/1	111.78
22	A	J1:2/2	B	J1:3/2	23.57
23	C	J1:8/2	A	J2:5/1	-
24	B	J1:5/2	A	J2:5/1	51.92
27	C	J1:8/2	B	J1:3/2	77.83
28	A	J1:2/2	B	J1:3/1	23.57
30	A	J1:2/2	B	J1:3/3	23.57
31	D	J2:2/2	B	J1:3/1	22.31
32	B	J1:5/2	E	J2:3/1	69.90
33	E	J2:4/2	B	J1:3/1	12.16
34	B	J1:5/2	D	J2:6/1	112.66
35	D	J2:2/3	C	J1:7/1	-
36	E	J2:4/3	C	J1:7/1	493.88
37	A	J1:2/3	C	J1:7/1	42.40
38	B	J1:5/1	C	J1:7/1	111.78
39	E	J2:4/3	E	J2:3/1	-
40	B	J1:5/2	B	J1:3/1	-
41	C	J1:8/2	A	J2:5/1	61.48
43	C	J1:8/2	C	J1:7/1	-
44	C	J1:8/2	B	J1:3/3	76.61
45	C	J1:8/2	B	J1:3/1	78.42

Basic Results Summary

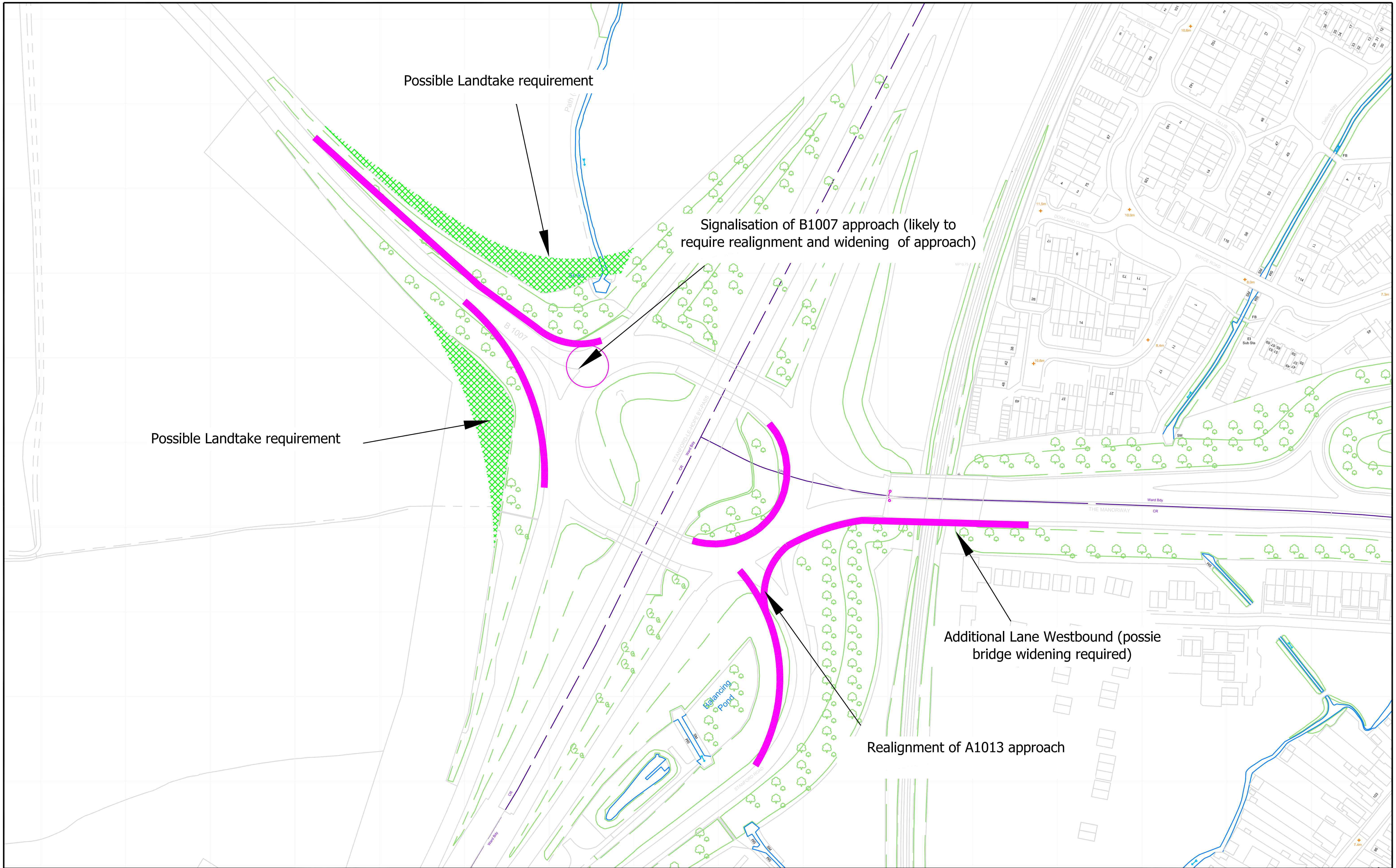
46	C	J1:8/2	E	J2:3/1	91.10
47	C	J1:8/2	D	J2:6/1	54.94

Traffic Flows, Actual

Actual Flow :

	Destination						
Origin		A	B	C	D	E	Tot.
	A	0	364	123	0	12	499
	B	271	0	79	2186	406	2942
	C	55	49	0	120	124	348
	D	0	1583	0	200	499	2282
	E	22	271	50	471	0	814
	Tot.	348	2267	252	2977	1041	6885

Appendix H



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JOB TITLE	CLIENT
Lower Thames Crossing	DPWLG

DRAWING TITLE
Manorway Interchange Concept Mitigation

SCALE	DRAWN BY	DATE	DRAWING No	REVISION
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App 429

Lower Thames Crossing

Written Representation in relation to economic impact on behalf of DWPLG

July 2023

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DPWLG

Contents

1. Introduction

1.1 Introduction to this study

1.1.1 Volterra Partners LLP ('Volterra') has been commissioned by London Gateway Port Limited, LG Park Freehold Limited and LG Park Leasehold Limited (collectively hereafter referred to as DPWLG), to produce a technical note outlining the potential strategic and economic impact that the proposed A122 Lower Thames Crossing ('the Project') could have on the operations of London Gateway (the term 'London Gateway' is used throughout this report to refer to both the Logistics Park and Port elements of the London Gateway site).

1.1.2 This technical note forms part of a wider submission of written representation which is being prepared by Lambert Smith Hampton (LSH) on behalf of DPWLG. The Submission of Written Representation also includes a technical note entitled 'Written Representation in relation to Traffic Impact on Behalf of DPWLG' (**DTA Report** hereafter) prepared by DTA Transportation Limited (DTA) which develops new transport modelling to consider the potential impact of the Project on the highway network local to London Gateway.[1]

1.2 Introduction to the Project and its objectives

1.2.1 The Project (displayed in **Figure 1.1**) would provide a connection between the A2 and M2 in Kent and the M25 south of junction 29, crossing under the River Thames through a tunnel.

1.2.2 The core initial benefit-cost-ratio (BCR) of the Project is 0.48, and the core adjusted BCR is 1.22. The Project's BCRs provide an estimate of the benefits relative to the cost and in this way offer an indication of the Project's Value for Money (VfM). This simplifies many different methodologies used to assess a variety of impacts, but simplistically these BCRs indicate that, for every £1 spent on the Project, benefits of between 48p and £1.22 are estimated to be delivered. Under Department for Transport (DfT) guidance, the core initial and core adjusted BCRs of the Project are 'Poor' and 'Low' respectively. A small range of sensitivity tests are presented which shift the adjusted BCR to between 0.80 and 1.72. Under these scenarios the Project remains either 'Low' or 'Poor' VfM, and at best, 'Medium' VfM.

1.2.3 The DCO document '7.1 Need for the Project' (**Need for the Project** hereafter) details the strategic objectives of the project and the issues it is hoping to address. The need case highlights that "*congestion, delays and poor journey time reliability at the Dartford Crossing and on surrounding roads are major impediments to economic growth*" and goes on to state that "*the lack of capacity across the River Thames and the congestion at the Dartford Crossing threaten to weaken the UK's international competitiveness, increasingly disrupt trade flows, stifle economic growth and hamper efforts to raise national productivity levels.*"[2]

1.2.4 With this in mind, the Project's key strategic objectives include: relieving congestion, improving resilience, supporting sustainable local development and regional economic growth in the medium to long term, and achieving value for money. The Project's objectives therefore explicitly acknowledge that congestion and poor reliability have negative impacts on economic growth, and in a location such as this could have impacts on international trade. Given the importance of port related economic activity in this location, one of the

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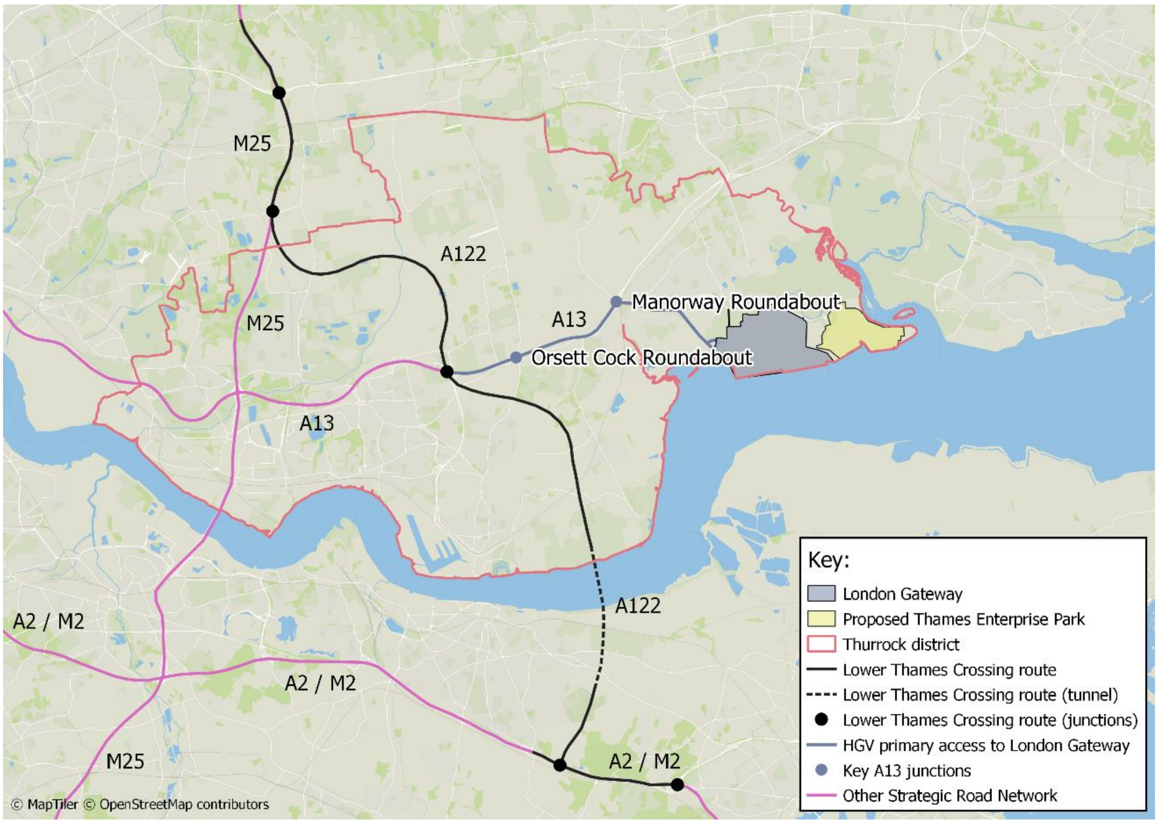
[1] DTA, 2023. Written Representation in relation to Traffic Impact Assessment undertaken by DTA Transportation Ltd (Annex A of the Written Representation on behalf of DPWLG submission)

[2] National Highways, 2022. Lower Thames Crossing 7.1 Need for the Project – paragraph 1.3.4

goals of the Project ought, therefore, to be to facilitate the efficient and reliable movement of freight, maintain and, where possible, improve the accessibility of ports.

1.2.5 It follows that the Project should not result in congestion or reduced resilience in respect of Port and Logistics Park access. Furthermore, the reputation of the Port as an efficient state of the art facility should not be compromised.

Figure 1.1 – the Project in the context of London Gateway and its access junctions



Note: The Project's route has been indicatively drawn based off publicly available DCO documentation. This should not be assumed as the Project's finalised route. Furthermore, the indicatively drawn outline of Thames Enterprise Park should not be assumed as red line boundary of its planning application.

1.3 The Project's connection to London Gateway

1.3.1 The transport and economic modelling provided in the DCO application estimates that the Project causes net positive benefits for users' travel times. However, the modelling also shows that the Project attracts increased traffic along the A13 (to the east of the Project) as new and rerouted trips are attempting to gain access to the new road network. This results in increased traffic at Orsett Cock Roundabout and Manorway Roundabout, and further displacement of traffic from Orsett Cock Roundabout to Manorway Roundabout.

1.3.2 The inadequacy of the Applicant's current modelling approach is detailed in the **DTA Report** which also presents results from a LinSig modelling assessment to further investigate the impacts of the Project on Orsett Cock Roundabout and Manorway Roundabout. This economic assessment relies upon the findings of the **DTA Report**. For ease of reference, specific tabular outputs from the **DTA Report** are reproduced in this report. The key findings from the **DTA Report** with corresponding paragraph references) utilised for the economic impact assessment are as follows:

- The existing modelling in the DCO application does not consider the more detailed assessments of these two junctions which have been submitted to Thurrock Council by the Applicant. This detailed assessment indicates significant queuing at Orsett Cock and thus a likelihood that traffic would be redistributed from Orsett Cock Roundabout to Manorway Roundabout (paragraph 1.11 (iii));
- The existing modelling in the DCO application does not consider the circumstances when incidents occur at the Dartford Crossing, and the effect this can have in compounding this problem; (paragraph 1.11 (vii));
- The LinSig modelling developed by DTA, which attempts to understand the above deficiencies in the DCO modelling, shows that the operational performance of Manorway Roundabout is very sensitive to increases in traffic. In some (indicative and likely conservative) modelled scenarios, volume against capacity ratios (V/C) for certain approach arms of the junction approach go in excess of 100% (Appendix G). This demonstrates the high likelihood of significant impacts at Manorway Roundabout even under conservative assumptions; and
- High V/C ratios cause high levels of travel time unreliability (section 3.1). Therefore, the high V/C ratios at Manorway Roundabout have the real potential to result in highly unreliable travel times for Port users through their sole (HGV) access junction to and from the Strategic Road Network (SRN).

1.4 Purpose and structure of the study

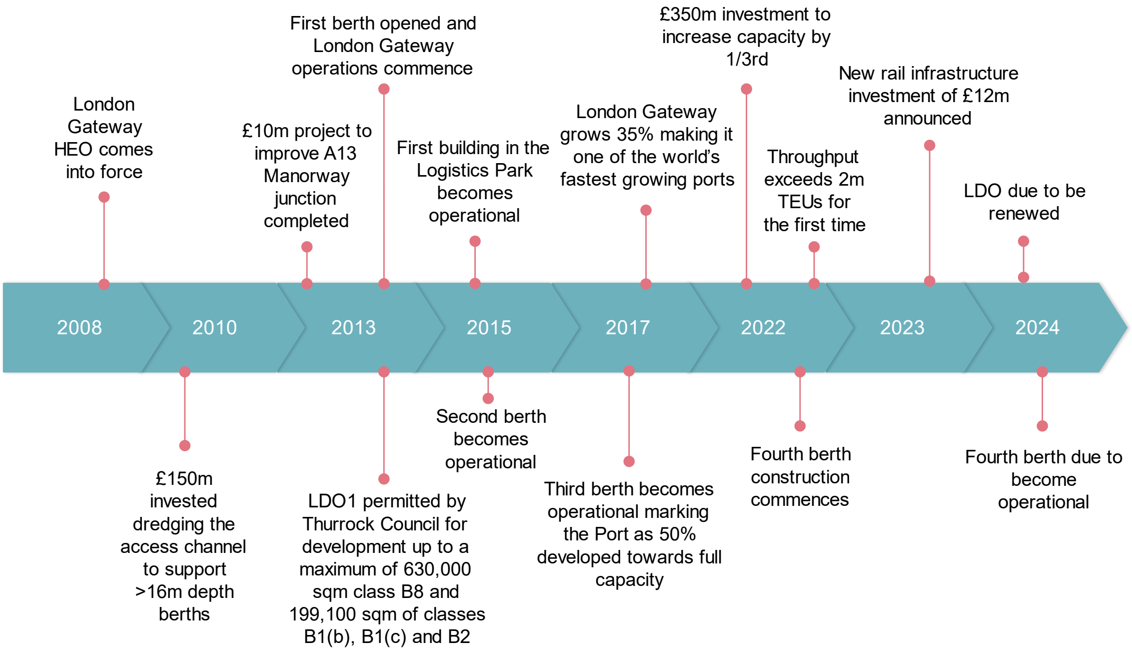
1.4.1 The purpose of this study is to investigate the strategic and economic impact that increased congestion at Orsett Cock Roundabout and Manorway Roundabout, caused by the Project, would likely have on the operations of London Gateway. This study has the following structure:

- **The critical strategic and economic importance of London Gateway to the UK** – sets out the role that London Gateway plays within the UK economy. This section provides context on the importance of the nationally significant economic assets, and outlines what is at stake if the Project materially disrupts the operations of London Gateway.
- **Review of existing DCO documentation** – a review of existing DCO documentation has been undertaken to understand the extent to which the Project's impact on London Gateway has been adequately accounted for in the existing economic assessment.
- **Economic impact of the Project on London Gateway** – uses outputs from the **DTA Report** and economic modelling to quantify the potential economic impact of the Project on London Gateway under a range of scenarios.

2. The critical strategic and economic importance of London Gateway to the UK

2.1 History of London Gateway

Figure 2.1: London Gateway timeline



2.1.1 London Gateway is formed of a deep sea Port which currently accommodates half of the UK's true deep sea berths and an adjacent Logistics Park which will be one of Europe's largest once fully built out. In this report 'true deep sea' is used to refer to berths which can accommodate the world's largest ships and have capability to support the next generation (up to 24,000 TEUs). Berths at other ports may be capable of supporting deep sea trade but not at the scale required for the current and future largest ships due to their shallower berths. A detailed summary of the history of London Gateway can be found in section 2 of LSH's Written Representation on behalf of DPWLG.

2.1.2 The Logistics Park is subject to a Local Development Order (LDO) as made by Thurrock Council in November 2013 (LDO1).[3] LDO1 permits development up to a maximum of 630,000 sqm class B8 and 199,100 sqm of classes B1(b), B1(c) and B2, subject to conditions. This is now the subject of a proposed second LDO (LDO2) which will effectively extend the life of LDO1 (with an up to date assessment process) to realise the full development potential of the Logistics Park in line with the overall original and continuing

[3] Thurrock Council, 2013. London Gateway Logistics Park Local Development Order

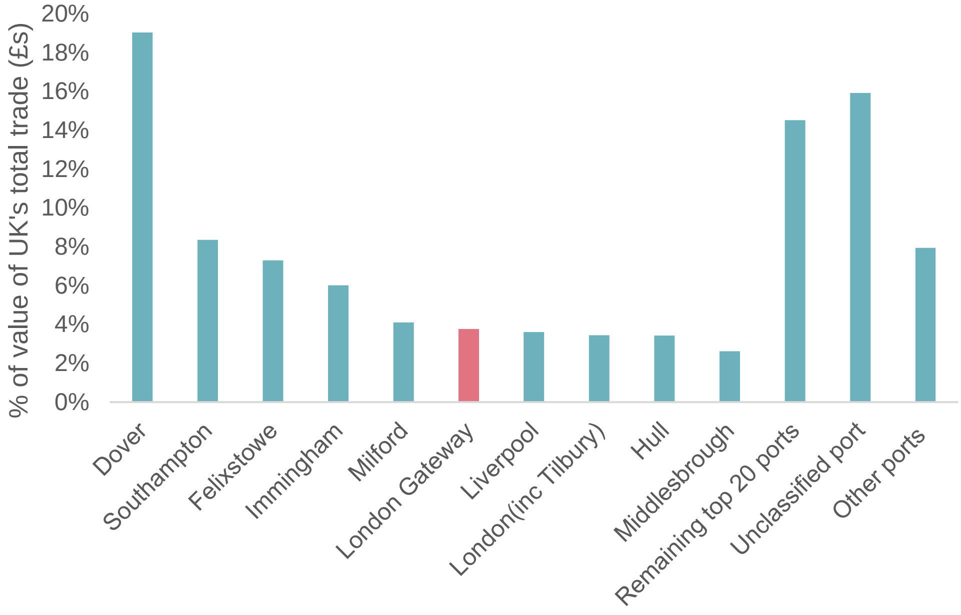
objectives. Given the long-term nature of the Project, the following economic impacts have been calculated under the assumption that the Logistics Park will be operating at full capacity by 2030.

2.2 London Gateway Port – key facts

2.2.1 As of 2022, the Port accounts for 3.2% (£13.9bn) of the value of UK exports and 2.4% (£16.1bn) of imports.[4] **Figure 2.2** shows the largest seaports in the UK for total trade in terms of value. A combined £30bn of total trade (imports and exports) passed through the Port in 2022, 4% of the UK total. In these terms, this ranks London Gateway 6th in the UK for all seaports. This is despite the fact that the Port and Logistics Park are not yet fully built out, the Port's rank and its national importance can be expected to rise with the completion of the remaining berths by 2030.

Figure 2.2 – London Gateway is the 6th largest seaport in the UK for the value of total trade

The UK's top seaports in terms of value for total trade (imports and exports), 2022



Source: HMRC, 2023. Overseas trade table. Notes: per HMRC guidance Dover refers to both the Dover and Dover/Eurotunnel port codes. Unclassified port includes the following port categories: Not Collected, Port of Clearance unknown, Inland Clearance, Low Value Non EU Trade, and Postal Packages.

2.2.2 More recent data for 2022 provided by DPWLG highlights the scale of London Gateway's operation. It is described as one of the fastest-growing ports in the world operating at a current capacity of 2.4m TEUs. Cargo turnover passing through the Port increased by more than 14% in 2022 and, in doing so, exceeded two million units in a year for the first time, consolidating its position as Britain's second biggest container terminal.[5]

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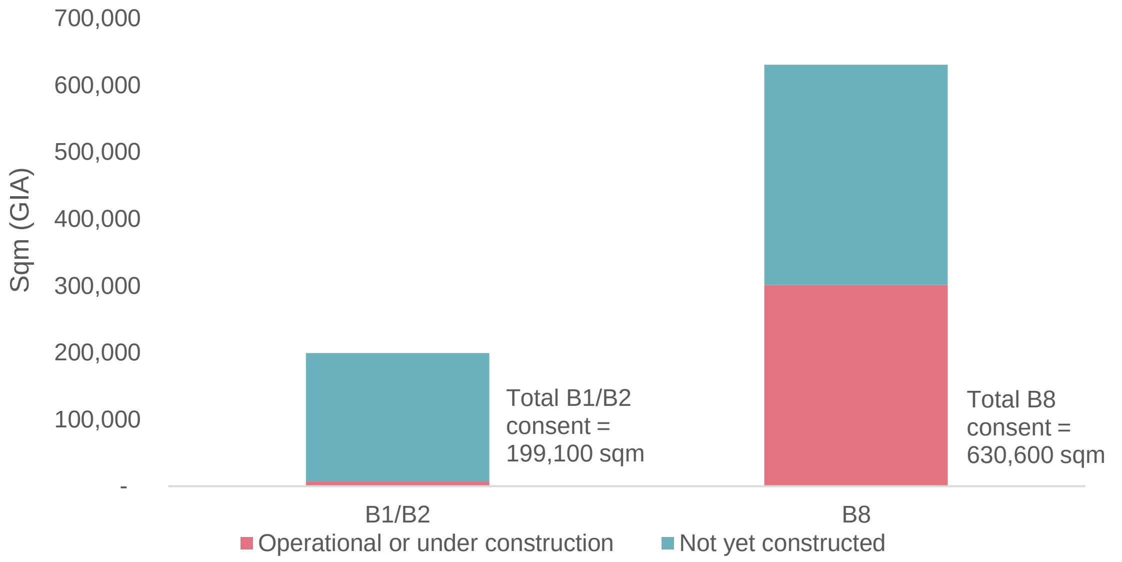
[4] HM Revenue & Customs (HMRC), 2023. Overseas trade table

[5] Information provided by DP World

2.3 London Gateway Logistics Park – key facts

2.3.1 As mentioned above, the Logistics Park is subject to LDO1 which permits up to a maximum of 630,000 sqm class B8 and 199,100 sqm of classes B1(b), B1(c) and B2. Of this, approximately 48% of the B8 space has been constructed or is under construction. This construction is expected to continue under LDO2 which will, once made, provide the means of realising the overall objectives for the Logistics Park without the need for individual planning applications.

Figure 2.3 – London Gateway Logistics Park LDO1 floorspace allocations



Sources: Information provided by DP World; Thurrock Council, 2013. London Gateway Logistics Park Local Development Order

2.3.2 The Logistics Park represents the largest logistics development opportunity in Western Europe.[6] Under the LDO regime, developers are able to fast-track applications which are within the LDO parameters. This, like other areas the subject of an LDO, is a key benefit of the site for investment purposes and to assist in meeting the objective for national economic growth.

2.3.3 The socio-economic chapter (SE Chapter) which formed part of the Environmental Impact Assessment (EIA) for the LDO1 application for London Gateway Logistics Park estimated that there would be a total of 13,415 gross full-time equivalent jobs (FTEs) supported on-site (7,885 through B8 uses and 5,530 across B1/B2 facilities).

2.3.4 Crucially, the co-location of the Logistics Park alongside the Port at this proximity and scale is unique within the UK. This enables economic efficiencies and sustainable transport benefits arising from the synergy that cannot be realised elsewhere in the UK.

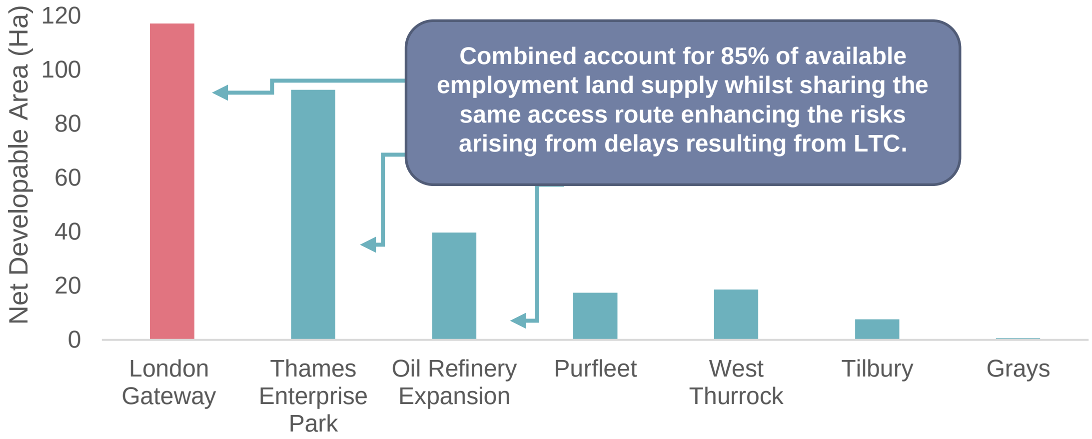
[6] Information provided by DP World

2.4 Underpinning Thurrock's employment growth

2.4.1 The recently published Thurrock Economic Development Needs Assessment clearly demonstrates the reliance that Thurrock has on the continued effective operation and future build out of London Gateway.[7] The assessment suggests a level of employment space provision which would support total jobs growth of 27,140 FTEs over the period 2020 to 2040. **Figure 2.4** shows the importance of London Gateway to achieving this target. London Gateway alone accounts for nearly 40% of the total available supply of employment land in Thurrock and when combined with the adjacent Thames Enterprise Park and Oil Refinery Expansion sites this rises to approximately 85%.

Figure 2.4: London Gateway accounts for nearly 40% of the available employment land supply in Thurrock.

Thurrock's available employment land supply by location (Ha)



Source: Hatch, 2023. Thurrock Development Needs Assessment

2.5 DP World's investment in the UK

"*As one of the most significant privately-funded projects in the UK over the last thirty years, with over £2 billion invested in the last decade, London Gateway is committed to building better futures for all. A further £1 billion of investment is earmarked for developing infrastructure, facilities and technology at London Gateway*."[8] – Ernst Schulze CEO DP World UK

2.5.1 The investment in the fourth berth alone will significantly expand the Port's, and hence the UK's, capacity for deep sea trade. The expansion will enable increased supply chain resilience and create enhanced capacity for the world's largest vessels. Upon completion of the fourth berth London Gateway will increase to:

- Four Berths (1685m)/16 QC;
- Quay length will grow to 1,685m increasing capacity by 35%; and
- Annual capacity will rise by a third in time for the delivery of a new wave of 24,000 TEU vessels in 2023/2024, which will be operated between Asia and Europe.

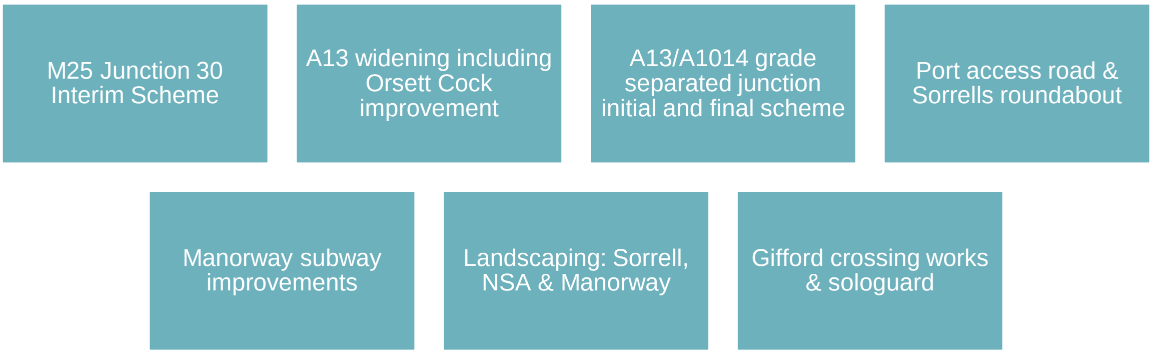
[7] Hatch, 2023. Thurrock Development Needs Assessment

[8] Information provided by DP World

2.5.2 Further investment is to come in the form of two additional berths to raise the total number to six, in line with the Harbour Empowerment Order (HEO).[9] Although dependent on market demand, DPWLG are aiming to fully construct London Gateway within the next decade.

2.5.3 Additionally, as shown in **Figure 2.5**, DP World have invested approximately £50m across different road improvement schemes demonstrating the awareness that it has for the need to continually improve the infrastructure related to London Gateway.

Figure 2.5 – DPWLG's road related investments



Source: Information provided by DP World

2.5.4 The economic, strategic and political importance of London Gateway has only increased with the recent approval of Thames Freeport. The growth that this designation seeks to facilitate can only be achieved with continuing investment from DP World, which will be fostered through the continuing efficient operation of the Port and Logistics Park.

2.6 Strategic importance to the UK economy

Nationally significant deep sea capabilities

2.6.1 The importance of London Gateway to the UK's trade is not solely demonstrated through its overall throughput. Once fully built, the Port will operate six berths capable of worldwide deep sea trade. In this context deep sea is referring to the classification of UK port traffic origins and destinations.[10] This is critically important to both current and future UK trade for a number of reasons. Currently, operating at three berths, London Gateway accounts for 16% of the UK's deep sea export value, the second most behind Southampton, and 9% of the UK's total deep sea trade value (**Figure 2.6**).[11] With the completion of the fourth berth in 2024, and the remaining two to follow, this proportion can be expected to rise. London Gateway currently accounts for half of the UK's six true deep water berths. Once fully built out this would rise to 2/3rds of the UK's true deep water capability being located at London Gateway.[12]

[9] Department for Transport, 2008. The London Gateway Port Harbour Empowerment Order 2008

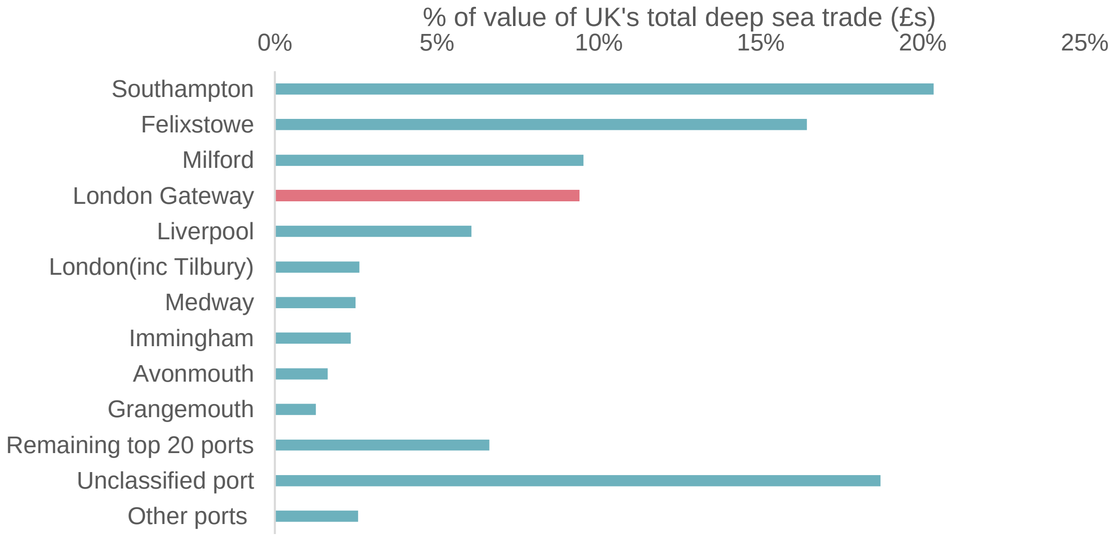
[10] Deep sea trade has been classified as all countries of Africa (excluding Mediterranean countries), America (both North and South America), Asia (excluding Mediterranean and Black Sea countries) and Australasia see HMRC, 2022. Port freight statistics: notes and definitions.

[11] HMRC, 2023. Overseas trade table

[12] This does not account for any future developments that may increase true deep sea capability at other ports in the UK.

Figure 2.6 – London Gateway ranks 4th in terms of the value all UK seaport deep sea trade

UK seaports total deep sea trade (imports and exports) value, 2022



Source: HMRC, 2023. Overseas trade table

2.6.2 The existing and consented true deep sea berths are designed with future proofing in mind, the depth of the berths and height of the cranes (the second tallest worldwide and the only in the UK capable of handling four TEUs at once) ensure that the Port can efficiently handle the current and future generation of shipping containers. Notably, through its location and access to the SRN, London Gateway has quick access to the so-called 'golden logistics triangle' within the Midlands.[13] This area is crucial for distribution across the country as 90% of the British population are within a four-hour drive. Compared to alternative true deep sea ports such Felixstowe or Southampton, London Gateway offers faster access to this key logistics hub.

2.6.3 The importance of the Port's ability to support increasingly large ships is demonstrated by trends in the global shipping market. Significant orders for new containerships began to build in the second half of 2020 and are now nearing 900 vessels with a capacity of over 7m TEUs. This compares to a total fleet of 6,400 vessels and 26m TEUs. However, the majority are for ultra large container vessels. As of Q2 2022, there were 718 vessels with a capacity of over 10,000 TEUs in operation and an order book of 400, of which 180 were vessels with a capacity over 16,000 TEUs.[14] Larger vessels require modern, highly productive ports to handle this capacity with true deep water berths of sufficient depth and length supported by some of the largest cranes, such as those at London Gateway. Across the UK's three true deep water ports, there is only a total of six true deep water berths. For the UK to continue receiving direct calls (rather than transshipment via Europe) this needs to increase. The fourth berth will raise capacity by a third and completion will coincide with the delivery of a new wave of 24,000 TEU vessels, which will all be operated from Asia.

2.6.4 The importance of London Gateway to the UK's deep sea trading position is furthered by its expansion capability. Unlike London Gateway, alternative ports such as Southampton and Felixstowe have very limited, if any, room to expand for berths which would be of suitable depth and size to accommodate the next generation of ships.

[13] ONS, 2022. The rise of the UK warehouse and the "golden logistics triangle"

[14] Information provided by DP World

2.6.5 There is a lack of alternatives for the largest ships to dock across Europe and cater to the UK market. Should congestion and resulting reliability issues become persistent at London Gateway, shipping lines may choose to renew their contracts with ports elsewhere either in the UK or, more likely, shift future growth to those in Europe such as Antwerp or Rotterdam from which they will then distribute their cargo onto smaller ships and onwards to the UK. This process would result in additional costs for the shipping lines which would in turn be passed down through the supply chain and eventually result in price rises for consumers. Moreover, this less efficient journey represents a cost in terms of the negative environmental effects, contradicting the Net Zero ambitions of the UK.

Ensuring the efficient movements of the UK's food imports

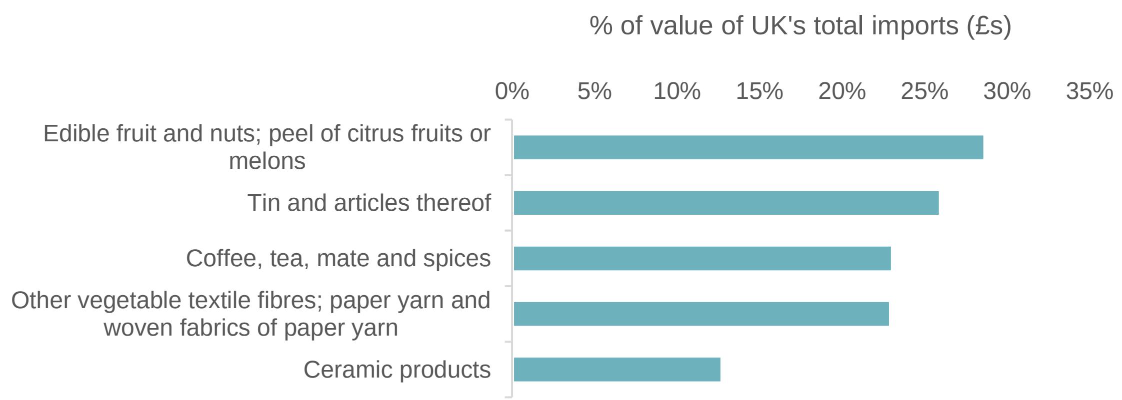
2.6.6 London Gateway is the UK's premier port for handling temperature controlled cargo, managing almost 50% of UK imports and 30% of exports.[15] Following investment in 2021, capacity was extended to accommodate peak demands with over 2,900 refrigerated units ('reefer') plugs - an equivalent in total of around 58,000 pallet spaces of goods. Every stage of the operation - vessel discharge, container storage, shunt transport, warehousing, processing and onward logistics - can be handled effectively between the Port and Logistics Park.

2.6.7 The UK imports 46% of the total food it consumes.[16] This varies by commodity, with only 16% of fruit consumed in the UK being produced domestically (84% of it is imported). This highlights the importance of supply chains in ensuring we have access to a wide variety of food. As recently as April 2023, supermarkets were forced to put limitations on certain fruit and vegetables to cope with the lack of supply.[17]

2.6.8 The importance of London Gateway is highlighted by the vital role it plays in bringing food into the country. In terms of values imported into the UK, in 2022, 29% of edible fruit and nuts and 23% of coffee, tea, mate and spices for the entire UK were imported into London Gateway the highest of any UK port (**Figure 2.7**).

Figure 2.7: London Gateway is crucial to the supply of the UK's fruit, tin, tea and coffee

Top 5 commodities for which London Gateway accounts for the largest proportion of the UK's total imports (value), 2022



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[15] Information provided by DP World

[16] Department for Environment, Food & Rural Affairs (DEFRA), 2021. UK Food Security Report 2021: Theme 2: UK Food Supply Sources

[17] The Guardian, 2023. More fruit and veg shortages to come as weather in UK and Spain hits crops

Source: HMRC, 2023. Overseas trade table

2.6.9 In March 2023, the Thames Freeport received approval from the UK Government. The partnership between Ford, Forth Ports Limited (Port of Tilbury) and DPWLG covers areas in the Thames Estuary and the Port of London. The key objectives of Freeports are to:

- Establish national hubs for global trade and investment;
- Promote regeneration and sustainable economic growth to level up the surrounding areas; and
- Create hotbeds for innovation to drive productivity improvements.

2.6.10 The Thames Freeport will also play a crucial role in Thurrock's future economic growth. It is estimated that the Thames Freeport will contribute £65bn to the UK economy over the next 25 years with London Gateway being a key component of this.[18] The significance of Thames Freeport to Thurrock and the surrounding area is demonstrated by the following key socioeconomic benefits:

- Over £4.56 billion in new public and private investment with 68% (£3.15bn) in Thurrock;
- 21,000 net additional jobs – with 89% of the employment opportunities located in Thurrock through Port of Tilbury and London Gateway;
- New jobs will earn higher wages than the average sectoral salaries in the Thames Freeport region; and
- Reducing unemployment and economic inactivity, tackling inequality through investment in physical and social infrastructure, increased skills and improved environment and more green space for local people.

2.6.11 The success of Thames Freeport is, therefore, both of regional and national importance. This success is undoubtedly dependent on the continued investment into London Gateway. However, the level of required investment is only achievable if there is sufficient demand for the planned expansions. This demand in turn relies on the continued efficient operation of London Gateway, the reliability of which should not be materially compromised by the Project.

2.7 Supporting the nationally significant logistics sector

2.7.1 The logistics sector is crucial to the UK's economic wellbeing. It is key to enabling other sectors to operate through ensuring that the goods which the UK produces and consumes can be distributed to their destinations efficiently. As of 2021, it was estimated that the transport & storage sector contributed £71bn in Gross Value Added (GVA) to the UK economy, greater than the total GVA produced by the entirety of Wales (£67bn).[19]

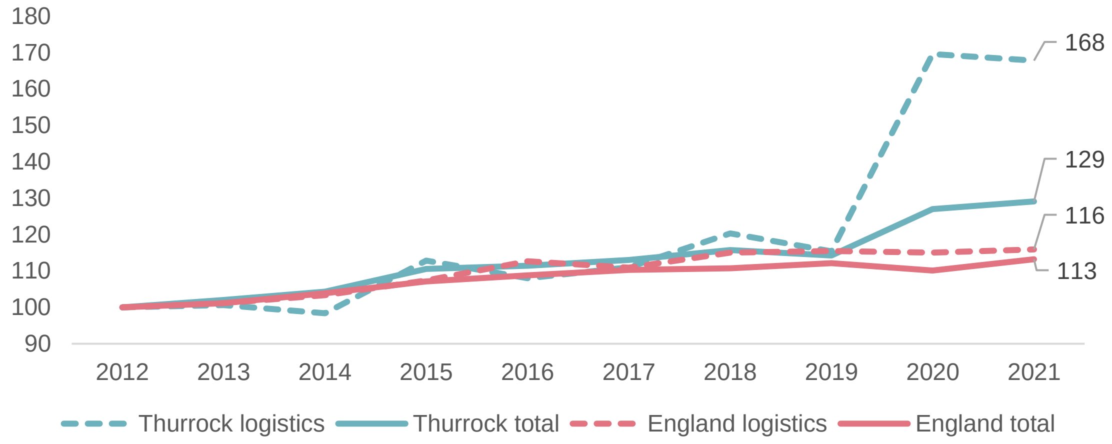
2.7.2 As demonstrated in **Figure 2.8**, this growth is evidenced by the logistics sector's above average local and national employment growth. The sharp increase in logistics employment in Thurrock between 2019 and 2020 is due to a large increase specifically in warehousing and storage employment, which was in part due to the historic buildout of London Gateway Logistics Park which saw nearly 33,000 sqm (GIA) of B8 floorspace become operational in 2019.

[18] Thurrock Council, 2022. Thames Freeport: Governance Structure

[19] ONS, 2022. Regional gross value added (balanced) by industry: all ITL regions

Figure 2.8 – both at a local and national level, growth in the logistics sector has been above average

Indexed employment growth in the logistics sector (2012 =100)

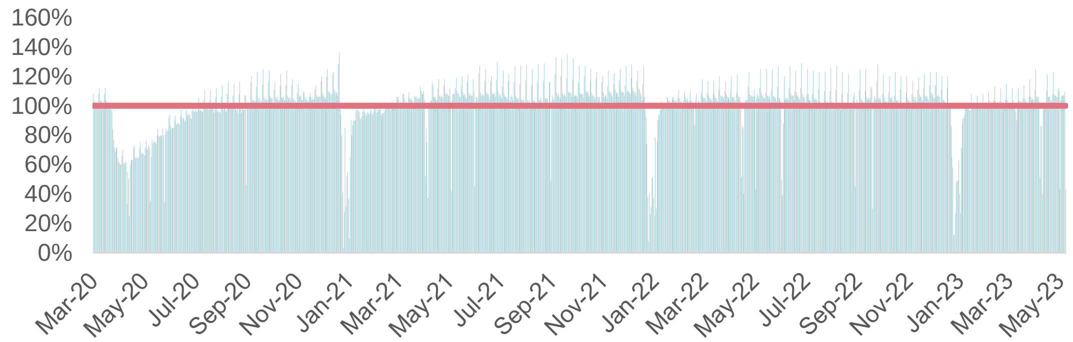


Source: ONS, 2022. BRES 2021

2.7.3 This sustained growth in the logistics sector has been matched by growth in HGV movements which rose during the pandemic. **Figure 2.9** demonstrates that as of July 2020, HGV trip numbers were significantly above pre-pandemic levels, and have stayed as such ever since.

Figure 2.9 – HGV trips have been consistently above pre-pandemic levels

Number of HGV trips in comparison to an equivalent day in the first week of February 2020



Source: DfT, 2023. Daily domestic transport use by mode
Note: Data is compared against an equivalent day in February 2020. Therefore, there are anomalously low results that align with national holidays.

2.7.4 Despite the increase in logistics related activity, the supply of space is not meeting demand. The three-year rolling average of UK take up of warehousing space has risen from just over 30m sqft in 2019 to just over

50m sqft in 2022.[20] Over the same period, vacancy rates have fallen from approximately 7% in 2019 to 4% in 2022.[21] In 2011, vacancy rates were over 20%.[22]

2.7.5 This increasing demand for logistics space, the importance of the sector to the UK economy, and the evidence that demand is starting to outstrip supply, all suggest that the operational efficiency of existing logistics space, and the ability to develop new logistics space, needs to be maintained, enhanced (wherever possible) and protected.

2.8 The need to support logistics clusters

2.8.1 Economic clusters are geographical concentrations of interconnected companies.[23] Clustering is a well-recognised model for success in innovative and highly tradable sectors. Clusters can include a variety of linked companies – including suppliers of specialised inputs and infrastructure, customers of the industry, and businesses working in complementary sectors.

2.8.2 There is a strong existing cluster of logistics firms in Thurrock. This is evident through the presence of multiple logistics related employment sites such as London Gateway, London Tilbury, and the concentration of distribution centres around Purfleet. This logistics cluster is reflected in employment data. Logistics employment comprises 25% of Thurrock's overall employment, significantly greater than the equivalent England composition of 7%.[24]

2.8.3 The importance of these linkages is further evidenced in transport assessments undertaken for London Gateway's LDO1. For example, the LDO1 transport assessment showed that 25% of secondary haul trips (trips which are transporting goods from the Logistics Park to shops or final mile distribution centres) head along the A13 west of the M25 into London. It is therefore crucial that the Project does not severely disrupt the local road network and hamper the economic linkages between London Gateway and local firms in terms of access to the Logistics Park as well as egress from it.

2.8.4 The success of this cluster is dependent on the ability of co-located logistics firms, and businesses from other sectors which complement the logistics industry, to have efficient transport access to one another. Many of the firms that London Gateway will interact with are based locally, and therefore trips to access these firms (which may not directly use the Project) should, so far as possible, benefit from a locally resilient and efficient highway network.

[20] Savills, 2023. Spotlight: Big Shed Briefing

[21] Savills, 2023. Spotlight: Big Shed Briefing

[22] Savills, 2023. Spotlight: Big Shed Briefing

[23] Harvard Business Review, 1998. Clusters and the New Economics of Competition

[24] ONS, 2022. BRES 2021

3. Review of existing DCO documentation

3.1 Introduction

3.1.1 Volterra has undertaken a review of existing DCO documentation to understand the extent to which the Project's impact on London Gateway has been adequately accounted for in the existing economic assessment. As part of this, the following documents have undergone detailed review:

- 7.1 Need for the Project – (**Need for the Project** hereafter);
- 7.7 Combined Modelling and Appraisal Report – Appendix D – Economic Appraisal Package: Economic Appraisal Report – (**EAR** hereafter);
- 7.7 Combined Modelling and Appraisal Report Appendix D – Economic Appraisal Package: Level 3 Wider Economic Impacts Report – (**L3WEIR** hereafter);
- 7.7 – Appendix D – Economic Appraisal Package – Distributional Impacts Appraisal Report – (**DIAR** hereafter);
- 7.7 – Appendix D – Economic Appraisal Package – Appraisal Summary Table Report (**ASTR** hereafter); and
- 7.12 Wider Network Impacts Management and Monitoring Plan (**M&M Plan** hereafter).

3.1.2 The review has reached the following three key conclusions, which are explained in further detail in the subsequent sections:

- The vast majority of Project's claimed economic impacts rely upon the Project's transport modelling, the adequacy of which is questioned in the **DTA Report**, undermining the robustness of the economic case;
- Inadequate consideration of London Gateway – the economic impact of the Project on London Gateway is not considered in sufficient detail or with sufficiently robust methodologies; and
- Mitigation – the Applicant's approach to mitigation is inadequate for safeguarding against potential economic harm.

3.2 The Project's economic impacts rely on the transport modelling

3.2.1 The Applicant's economic appraisal of the Project follows the industry standard, and DfT recommended, approach for the economic appraisal of highway projects. That is, the development of a strategic transport model (LTAM) the outputs of which (mainly changes in travel time, travel distance, and vehicular flow) are fed into a number of economic modelling software packages. The two main economic software packages used are Transport User Benefit Appraisal (TUBA) software and Wider Impacts in Transport Appraisal (WITA) software.

3.2.2 TUBA software and WITA software calculate the overwhelming majority of the Project's economic impacts. In fact, travel time impacts (derived from TUBA) form 97% of the Project's initial (level 1) benefits and 51% of the Project's combined initial and adjusted (level 1 and 2) benefits.[25] Static agglomeration impacts

[25] 'Initial benefits' refer to those impacts which have a relatively higher degree of certainty and established methodologies. 'Adjusted benefits' refer to additional impacts with less analytical certainty. Note within the presented percentages, travel time impacts (both positive and negative) have been compared against all positive benefits (initial and adjusted,

(businesses improving their productivity by benefitting from shorter travel times to one another, derived from WITA) make up the majority of the remaining combined initial and adjusted benefits at 46%.

3.2.3 Therefore, nearly all of the Project's monetised benefits derive from economic modelling software packages for which their results wholly rely on outputs from the LTAM. As such, a critique of the Project's transport modelling approach is effectively a critique of the Project's economic appraisal.

3.2.4 Paragraph 1.11 of the **DTA Report** has identified a number of ways in which the Project's transport modelling approach is inadequate, and for the reasons outlined above, such a critique feeds through to question the robustness of the tool being used to underpin nearly all the Applicant's economic analysis of the Project.

3.2.5 Furthermore, throughout the Issue Specific Hearings related to the Project, the Applicant has stated multiple times that the Project will deliver economic benefits for Port users. This has been justified through reference to high magnitude travel time savings experienced by trips to and from London Gateway (amongst other ports), which are presented in appendices to the Applicant's Transport Assessment (**TA** hereafter).[26] Again, this conclusion must be tested against an assessment of localised impacts on the network using appropriate modelling tools, given DTA's conclusions to date.

3.3 Inadequate consideration of London Gateway

3.3.1 Volterra's review of DCO documentation has identified three economic impacts which at present are either not assessed, or not sufficiently or adequately assessed, to understand the impact of the Project on London Gateway (in addition to the comments made above on monetised travel time impacts):

- Trade impacts (assessed in **EAR** but not adequately);
- Option and non-use impacts (assessed in **EAR** but not adequately); and
- Possibility of internal port disruption (not assessed in **EAR**).

3.3.2 Whilst the **EAR** does not mention London Gateway explicitly at any point, an economic assessment on London Gateway has been inferred from the evidence presented in the **EAR**. Each of the following subsections discusses the inadequacy of the **EAR's** assessment of the Project on London Gateway with respect to the above three impacts in turn.

Trade impacts

3.3.3 Subsection '10.9 International trade impacts' of the EAR presents a light touch qualitative assessment of the Project's impacts on trade. It concludes that the Project would have a Slight Positive impact for international trade, but notes that this would be heavily dependent on the capacity of ports to handle additional freight vehicles.

3.3.4 It is considered that London Tilbury and London Gateway's capacity to handle additional freight vehicles may be impacted by the localised transport issues at Orsett Cock Roundabout and Manorway Roundabout outlined above.

3.3.5 **Chapter 4** outlines how economic growth at London Gateway could be constrained because of the added pressure that the Project places on Manorway Roundabout. This constraining of growth could inhibit or

respectively) of the Project; National Highways, 2022. 7.7 Combined Modelling and Appraisal Report – Appendix D – Economic Appraisal Package: Economic Appraisal Report

[26] National Highways, 2022. 7.9 Transport Assessment Appendix C Journey Time Changes 2030; National Highways, 2022. 7.9 Transport Assessment Appendix C Journey Time Changes 2045

delay the buildout of London Gateway's additional proposed true deep sea berths (up to a maximum six) and the remaining space to be developed at the Logistics Park. Given the very small number of UK ports that are able to handle true deep sea cargo, there is a very real possibility that constraining of growth at London Gateway would have a detrimental impact on international trade and deter inward investment.

Option and non-use impacts

3.3.6 Option and non-use impacts refer to the value that can arise from a transport intervention for users who do not intend to directly use or benefit from the intervention, yet the intervention results in an increased range of options for them, both in terms of travel behaviour and development potential.[27] Section '10.4 Option and non-use' of the **EAR** outlines how the major increased highway capacity enables the option of housing and employment land to be developed along the Project route and at key junctions. This effectively increases the options of land allocations that local authorities and private developers can develop, as these areas might have previously been unable to have been developed due to transport constraints.

3.3.7 Given the large increase to the highway network's capacity, the **EAR** concludes that the Project's option value for development is Large Positive.

3.3.8 This assessment fails to acknowledge the effect of the Project displacing traffic to key local highway junctions and deteriorating the operational performance of these junctions. As detailed in Section 2, due to the high proportion of Thurrock's employment allocations which are located here, the result could in reality be the opposite to that intended, restricting further development in these locations, thereby decreasing the options of site allocations for local authorities and private developers.

Possibility of internal port disruption

3.3.9 The increased flows at Manorway Roundabout, resulting from the Project's implementation, have the potential to constrain access to and from London Gateway. This constrained access can manifest itself in unreliable travel times through Manorway Roundabout, which can result in HGVs being late for allocated booking slots to offload and receive freight. This can in turn lead to internal disruption within the operations of the Port and inefficient use of time for hauliers.

3.3.10 This effect is not recognised at any point in the **EAR** and represents a clear gap in the Applicant's analysis of the economic impacts of the Project. Narrative for how this economic impact could manifest, and the associated negative economic impacts, is set out in **Chapter 4**.

3.4 Mitigation

3.4.1 The Applicant's strategy for mitigating against the potential economic harm caused by the Project is inadequate. This section is set out in three subsections which cover the following subject matter:

- Junction sifting – an outline of the Applicant's approach to selecting junctions which should be the focus of monitoring and management with the potential for future mitigation. Crucially this process already identifies major adverse impacts at Manorway Roundabout, even in the Applicant's own modelling;
- The Applicant's mitigation strategy – an outline of the Applicant's proposed strategy for mitigation. This places all responsibility for identifying funding opportunities, developing the business case for mitigation proposals, and delivering the mitigation, onto local authorities; and
- Inadequacy of the Applicant's mitigation strategy – this strategy is inadequate given it conflicts with national policy, does not directly mitigate impacts caused solely by the Project, there is absolutely no

[27] DfT, 2022. TAG Unit A4.1 - Social Impact Appraisal

certainty the mitigation will be delivered, and, even if it is, the timeframes are such that there would be economic harm caused whilst waiting for the mitigation to be implemented.

Junction sifting

3.4.2 The Applicant's **TA** identifies areas of the highway network which experience adverse impacts as a result of traffic displacement caused by the Project. Impacts are categorised as Minor, Moderate, or Major. See the **TA** for details on how this categorisation is derived.

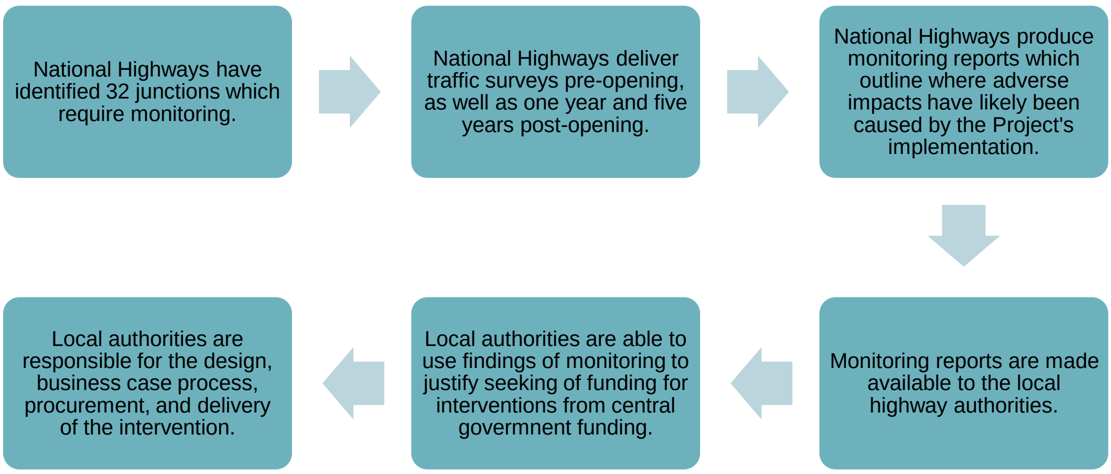
3.4.3 Paragraph 2.3.20 of the **DTA Report** outlines how the **TA** suggests major adverse impacts in the vicinity of Manorway Roundabout in the PM peak. It is noted in the **DTA Report** that this major adverse impact is before consideration of the potential reassignment of traffic to Manorway Roundabout caused by delays at Orsett Cock Roundabout.

The Applicant's mitigation strategy

3.4.4 **Figure 3.1** details the Applicant's approach to managing and monitoring the effect of the Project on the wider highway network. The Applicant will monitor the effect of the Project on the wider highway network and summarise this in monitoring reports produced one year and five years after Project implementation. These monitoring reports can then be used by local authorities to justify obtaining funding from central government (the **M&M Plan** suggests funding pots such as the Major Road Network fund, the Large Local Majors programme, and The Levelling Up Fund amongst others). However, crucially, responsibility for business case applications to these funds and delivery for the proposed mitigation proposals would lie with the local authorities, essentially absolving the Applicant of responsibility in mitigating the adverse impacts of the Project. The process for obtaining funds to deliver a mitigation scheme can often have long timescales as discussed in the subsection **the economic cost of waiting instead of immediate action** below.

"In the event that the traffic impact monitoring and the review of its findings identifies that future investment would be suitable, relevant local highway authorities could seek funding to develop and bring forward potential solutions from existing work streams. Assessment and prioritisation of those schemes must be properly dealt with through the relevant investment approval processes, including any intervention that requires obtaining its own consent (e.g., DCO)."[28]

Figure 3.1 – The Applicant's approach to management and monitoring



[28] National Highways, 2022. Lower Thames Crossing 7.12 Wider Network Impacts Management and Monitoring Plan

The unacceptability of the Applicant's management and monitoring approach

3.4.5 Volterra assesses the Applicant's approach to mitigation as inadequate in its ability to mitigate potential economic harm arising from the Project for the following reasons, each of which is unpacked further in each of the subsequent subsections:

- The Applicant's **M&M Plan** is contrary to the objectives of their latest Road Investment Strategy;
- DPWLG should be formally included in the stakeholder consultation process;
- It is inappropriate that the Applicant appears to be unwilling to deliver mitigation proposals outside of the DCO boundary, under any circumstances related solely to congestion; and
- There is an economic cost to monitoring and waiting instead of immediate mitigation action.

Contrary to Road Investment Strategy 2

3.4.6 The Applicant's Road Investment Strategy 2 (RIS2) sets out the long-term strategic vision for the SRN and lists planned SRN enhancements to be delivered as part of Road Period 2 (RP2, 2020-2025), and "*…specifies the performance standards **Highways England [the Applicant] must meet**.*"[29] In its current design, the Project does not fulfil this commitment for the following reasons.

- One of the performance standards is as follows – *"For average delay we have set an ambition for performance at the end of RP2 to be no worse than at the end of RP1."*[30]
- A performance indicator cited as being used as evidence to determine the fulfilment of the above ambition is as follows – "*Delays on gateway routes: average delay (seconds per vehicle mile) observed on gateway* [port and airports] *routes compared to all vehicles travelling at speed limit.*"[31]
- It is further noted that the HGV access route to London Gateway will soon form part of the SRN. "*Trunking:…, and the A13/A1014 from the end of the trunked A13 through to the recently-opened London Gateway Port, with a view to transfer to Highways England.*"[32]

3.4.7 These three excerpts would imply the following. The Applicant has a responsibility, as per their own strategy documentation, to ensure the enhancements included in RIS2 – of which the Project is one – do not increase delay on the A13, Manorway Roundabout, and A1014. Transport modelling results presented in the **DTA Report** demonstrate that without specific (and as yet unidentified) mitigation, the increases in delay, travel time, and V/C ratio experienced at Manorway Roundabout as a result of the Project would likely result in significant impacts. Therefore, it would appear that the Applicant's lack of willingness to implement mitigation proposals is contrary to the requirements of its own RIS2.

3.4.8 It is anticipated that the Applicant's response to the above objection would be reference to the travel time changes reported in Tables 1.4 of DCO documents **7.9 Transport Assessment Appendix B Journey Time Changes 2030** and **7.9 Transport Assessment Appendix B Journey Time Changes 2045.** These show significant travel time improvements for all movements to and from London Gateway, and hence it would be argued that delay on gateway routes has not increased and that the Project is in alignment with RIS2. However, as set out in the **DTA report**, little weight can be given to the robustness of the LTAM, particularly in the areas around Orsett Cock Roundabout, Manorway Roundabout, and the A13. The limitations of this modelling approach have been made clear above, which in turn cast doubt on the validity of such a response from the Applicant.

[29] National Highways, 2020. Road Investment Strategy 2 (RIS2): 2020-2025

[30] National Highways, 2020. Road Investment Strategy 2 (RIS2): 2020-2025

[31] National Highways, 2020. Road Investment Strategy 2 (RIS2): 2020-2025

[32] National Highways, 2020. Road Investment Strategy 2 (RIS2): 2020-2025

Stakeholder consultation

3.4.9 DPWLG have not been included in the stakeholders to be formally consulted as part of the **M&M Plan**. It is recognised that the stakeholder list is exclusively comprised of highway authorities and local planning authorities (whilst DPWLG is not one, the HEO established London Gateway Port as a harbour authority, and hence it has a statutory status) and thus stakeholders have been selected who have the relevant powers to prioritise and develop highway mitigation schemes.

3.4.10 However, Manorway Roundabout and Orsett Cock Roundabout are crucial to the operations of London Gateway Port. In fact, DPWLG have already invested significant funding into improvement schemes to these roundabouts. They have designed them to ensure their capacity matches the demand of the fully built-out Port and Logistics Park. It is also likely that if these junctions became under strain in future, then others would seek funding from DPWLG to help deliver improvement schemes. Indeed, the recent Levelling Up Fund (a fund suggested by the Applicant in the **M&M Plan** as being suitable for applications for mitigation proposals following the Project's implementation) required projects to be delivered with 10% of costs being covered by developer contributions. Reliance on the private sector to contribute funds to deliver transport schemes in Thurrock is likely to increase given Thurrock Council's recent financial difficulties.[33] Given DPWLG have already delivered the required mitigation at these junctions to match the full buildout of London Gateway, any additional cost incurred by DPWLG would not be appropriate.

3.4.11 Given DPWLG's historic financial stake (circa £50m – see **Figure 2.5**) and likely future financial stake in the local highway network, as well as these roundabouts critical importance to a strategic economic asset in the form of London Gateway, it is crucial that they are formally included in the stakeholder consultation process for management and monitoring the wider network impacts of the Project.

Lack of reasonable commitment to delivering mitigation under any circumstances

3.4.12 In the **M&M Plan**, the Applicant outlines that their assessment shows that the extent to which the performance of local junctions deteriorates is an "acceptable" level from a policy perspective, referencing '7.9 Transport Assessment Appendix F – Wider Network Impacts Management and Monitoring Policy Compliance' (**TA Appendix F** hereafter).

3.4.13 A key extract from the early sections of the **TA Appendix F** is outlined below. On first sight, this suggests that the Applicant has no intention under any circumstances (related solely to congestion)[34] of incorporating any mitigation measures into the Project – *"There are multiple references to congestion in the NPSNN* [National Policy Statement for National Networks][35] *including its adverse effects on quality of life (para 2.16) and the damaging effects of congestion (para 2.21)… **There is, however, no specific requirement to propose interventions in response to increased congestion**… Paragraph 5.215 sets out that in the section on 'impacts on transport networks' that "Mitigation measures should be proportionate and reasonable, focussing on promoting sustainable transport" and paragraph 5.205 which sets out that consideration should be given to "reasonable opportunities to support other transport modes in developing infrastructure."*[36]

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[33] Essex County Council, 2023. Thurrock Council Best Value Inspection Report

[34] It is noted that the **TA Appendix F** makes clear that formal policy requirements can necessitate scheme promoters to implement mitigation proposals where major adverse impacts are possible with respects to accessibility for non-motorised users and safety.

[35] DfT, 2014. National Policy Statement for National Networks

[36] National Highways, 2022. Lower Thames Crossing 7.9 Transport Assessment - Appendix F - Wider Network Impacts Management and Monitoring Policy Compliance

3.4.14 In our view, this means there is no credible path nor reasonable commitment to delivering appropriate mitigation under any circumstances related solely to highway congestion outside of the DCO boundary.

3.4.15 This position has been confirmed to DPWLG by the Applicant throughout the engagement process. Furthermore at the Project's Issue Specific Hearing held on Wednesday 21st June 2023, Mr Henderson on behalf of the Applicant made the following remark. *"… for a project of the scale of the Lower Thames Crossing, it is not feasible for it to incorporate all potential interventions across the region that are not required to meet the scheme objectives."*[37] Whilst it may not be feasible to mitigate against all the Project's impacts in the region, this assumes that all impacts have equal weight and should be given equal consideration. However, impacts that occur on access junctions to infrastructure which is of critical importance to the UK economy should be given careful consideration and the need for mitigation at Manorway Roundabout (given the critical role of London Gateway to the UK economy) should be given considerable weight, not least for the reasons discussed below.

The economic cost of waiting instead of immediate action

3.4.16 National Highway's approach to management and monitoring has been summarised in **Figure 3.1** and is also summarised in **TA Appendix F** – *"Over time, it will be very difficult to demonstrate that traffic flow changes on the road network were solely as result of the Lower Thames Crossing and not other factors such as wider demand for travel, nearby new development, or changes in the way the road network was managed. As such National Highways consider it appropriate that the existing framework for managing the road network, as set out above, remains the appropriate way to make decisions about future investment priorities."*[38] The central issue with this approach is that it does not recognise the potential economic loss that can occur in the time-period between the Project's implementation and the immediate disruption it may cause.

3.4.17 Data will be collected one year and five years following the Project's implementation. On each occasion the monitoring reports will be made available at a later stage (although no commitments on timescales are given in **TA Appendix F** for when this would be, following the data collection). Subsequently, local authorities would then need to commence the following process:

- Develop an options assessment analysis to decide which option should be taken forward for the business case process;
- Develop a Strategic Outline Business Case, Outline Business Case, and Full Business Case to obtain funding for the scheme;
- Submit the Full Business Case and then wait for a funding decision;
- If unsuccessful, revisit the business case;
- If successful, obtain permission and other necessary consents/orders; and
- Procure and construct the scheme.

3.4.18 In an optimistic scenario, the length of time between the Project's implementation and mitigation schemes at Orsett Cock Roundabout and Manorway Roundabout materialising would be around five years at the very best, with more realistic timescales being 5-10 years.

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[37] Planning Inspectorate, 2023. Transcript of Issue Specific Hearing 1 (ISH 1) - 21 June 2023. Retrieved from https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010032/TR010032-002322-230621%20-%20Lower%20Thames%20Crossing%20-%20Issue%20Specific%20Hearing%201%20Transcript.pdf accessed June 2023

[38] National Highways, 2022. Lower Thames Crossing 7.9 Transport Assessment - Appendix F - Wider Network Impacts Management and Monitoring Policy Compliance

4. Economic impact assessment

4.1 Introduction

4.1.1 At present, the operations of Manorway Roundabout are such that congestion levels are low, and HGVs wishing to enter and leave London Gateway have suitably free-flowing access. Upgrades to the junction provided by DPWLG were, as is explained in the **DTA Report** paragraph 2.3.1 to 2.3.4, specifically designed to ensure this is maintained. Given the critical strategic and economic importance of London Gateway to the UK economy, and the objectives of RIS2, this suitably free-flowing access should be maintained. As shall be demonstrated below, a suitable mitigation scheme would have a strong likelihood of delivering good VfM for the population, particularly as it would serve to avoid the following two negative economic impacts:

- Internal port disruption; and
- Constrained economic growth.

4.1.2 As an indicative exercise, the potential scale of such negative economic impacts has been monetised, based on a range of illustrative assumptions. Whilst illustrative assumptions have been used in order to develop the economic modelling presented, wherever assumptions are made they are set out transparently, with appropriate rationale provided. The evidence clearly shows that the assumptions are both defensible and conservative.

4.1.3 In calculating monetised values for these negative economic impacts, the corresponding benefits of removing these impacts, through mitigation proposals, are then compared against the provisionally estimated cost of such proposals (bearing in mind they can only be schematic at this stage).

4.1.4 This exercise shows that mitigation proposals would likely deliver good VfM for the taxpayer. However, it is noted that irrespective of VfM considerations, there is clear strategic rationale to ensure that the continuing resilience of London Gateway, in line with national policy objectives is maintained. It remains important, therefore, that the principal and only access to the Port and Logistics Park from the SRN will continue to operate efficiently if it is to benefit from the overall improvements the Project is intended to deliver.

4.2 Internal port disruption

Overview of London Gateway's operations

4.2.1 This subsection provides an overview of the operations of London Gateway. This overview offers context for how internal operations could be disrupted following increased highway congestion at Manorway Roundabout. **Figure 4.1** presents a visual summary of the Port's operations.

4.2.2 The primary operation of London Gateway Port is the import and export of containerised goods to / from container ships. This is combined with the intermediate storage of containerised goods and the loading / receipt of containers to / from HGVs and rail. This exchange is two-way, meaning that HGVs arrive with containers (usually one 40 foot container, or two 20 foot containers, dependent on the type of HGV) to be loaded to container ships. Normally during the same allocated slot, HGVs receive containers which have been discharged from the container ships. The connecting component where the transfer of containers between the ship to HGV, and HGV to ship occurs, is 'the yard'. The yard is the area between the ships and the HGVs where containers are stacked (referred to as 'the stack'). Containers are removed from the ship and placed on the stack where they await collection from HGVs (and vice versa). Containers are predominantly moved by gantry cranes.

4.2.3 This process currently happens in a very efficient manner. The Port operates an online Vehicle Booking System (VBS) which allows the haulage company to select an available slot for the HGV to arrive. The VBS is linked to the Terminal Operating System (TOS) whereby checks are made that the container has a valid record and is cleared for collection or booked to a particular vessel. The haulage company select the date and time for the HGV to arrive.

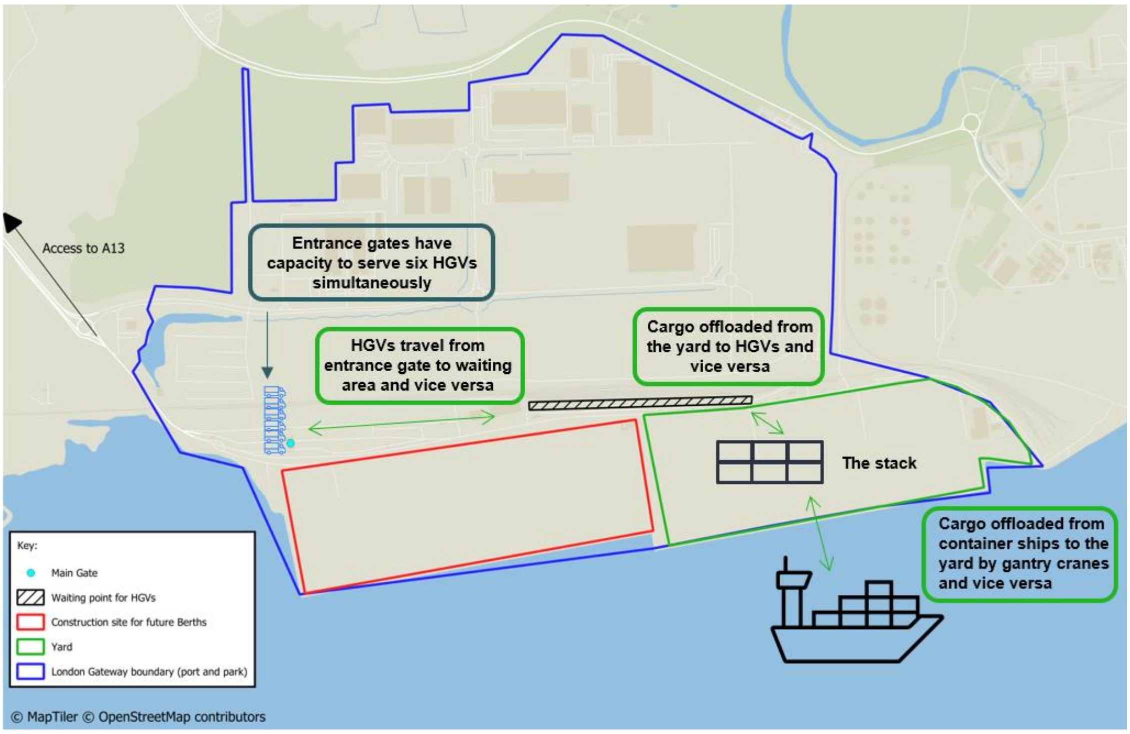
4.2.4 The HGV will access London Gateway Port, exiting the SRN from Manorway Roundabout and travelling along the A1014 towards the Port's entrance.

4.2.5 On arrival, the driver applies the VBS reference number to the kiosk. The TOS confirms the reference number is correct for the time booked and the required container is present. If all confirmed, the pre-gate barrier is lifted and the HGV travels to the main gate where checks are undertaken. If checks are passed, a ticket is provided to the HGV driver detailing the area within the Port the driver is required to deliver / receive booked containers. In the event the area is already full with other HGVs, the HGV is asked to park up in the Call Forward Zone, an area with a series of diagonal HGV parking bays. Once a space is available, the HGV driver registration will flash up on the digital display and the HGV driver then collects their ticket and proceeds to their delivery / collection container area.

4.2.6 The HGV then arrives at the correct stacking area (module). There are currently 30 modules with six bays in each module. Once Berth four is operational, there will be an additional nine modules with six bays in each module. The HGV can reverse into any bay within the correct allocated module. The HGV driver undertakes their truck / container checks ready for receipt / delivery and announces their arrival via a kiosk next to the bay. Once a crane is ready to service the HGV, the HGV driver confirms presence at the kiosk while the container on the HGV is removed from the HGV and placed onto the stack by an automatic gantry crane. Once completed, the HGV driver will either depart the Terminal or travel to the next stacking area (called a module) to collect the import. This whole process is automated and manages the delivery / collection associated with the VBS booking. The HGV driver then departs the Terminal.

4.2.7 This process is highly automated, with the TOS ensuring containers are moved from ship to stack, rearranged in the stack, and then moved from stack to HGV, in the most efficient manner possible. The system, although automated, can be dynamic to unexpected changes.

Figure 4.1 – diagram of the operational elements of London Gateway Port



How highway congestion can lead to disruption at London Gateway

4.2.8 Currently the Port operates very efficiently, with delays and disruption being infrequent events. When the local highway network does become unexpectedly congested, this can cause HGVs to be prevented from arriving within the pre-arranged slots.

4.2.9 HGVs prevented from arriving within their booked slots create many inefficiencies. Firstly, this creates inefficiencies for the hauliers themselves. If hauliers are prevented from arriving within their allocated booking slots, they will need to rearrange a new slot. Dependent on the usage levels of the Port, hauliers may have to wait several hours before a new slot is available.

4.2.10 HGVs prevented from arriving within their allocated booking slot also creates inefficiencies for the internal operations of Port. This is because the arrangement of the stack of containers will have been predetermined, with the container that the HGV is receiving being at the top of the stack. When an HGV does not arrive within its allocated booking slot, container stacks have to be continually rearranged using what are called “unproductive crane movements”. This is as opposed to productive crane movements which move containers onto HGVs (and vice-versa). A high percentage of crane movements being unproductive causes inefficiencies for the Port and has knock on delays for Truck Turnaround Times (TTT – the total amount of time between the HGV arriving at and exiting the main gate of the Port), because HGVs (even when arriving on schedule) have to wait whilst the stack is being rearranged to retrieve their container.

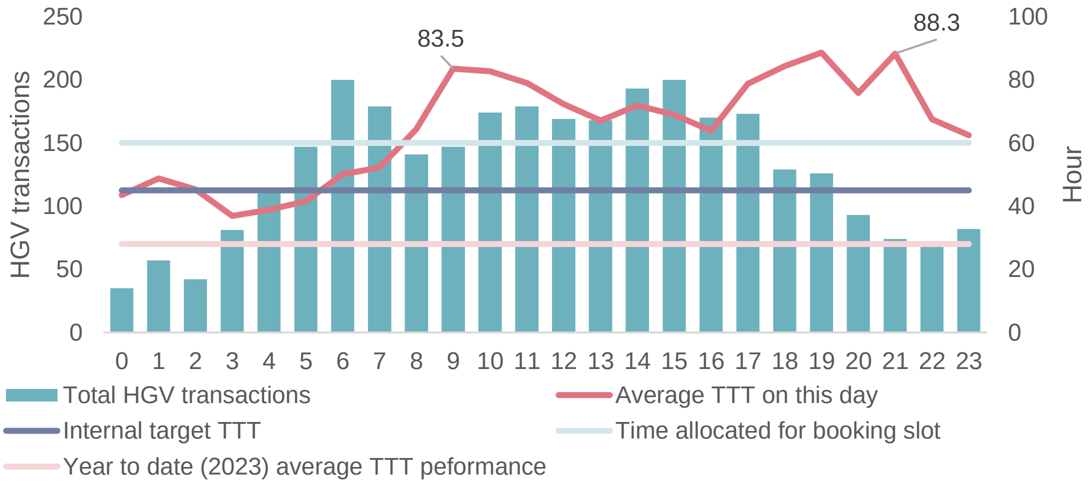
4.2.11 There are currently two peak times for HGVs arriving – early morning and then from mid-day to mid/late afternoon. The morning peak is far more efficient due to the pre-booking of VBS slots where the TOS has undertaken extensive housekeeping of booked containers in order of delivery times. The afternoon peak is not as efficient due to VBS bookings being made in much shorter timescales. Therefore, any disruption occurring at the start of the day can have a ripple effect persistently increasing TTT throughout the day, even when demand drops off later in the day. In 2023, the infrequent instances of internal port disruption have usually occurred for reasons outside London Gateway's control (such as high winds, frost or power surges). **Figure 4.2** displays a day where internal port disruption caused a knock-on impact on average TTT. This disruption was caused by an isolated incident at a single module. On this day, average TTT was 54 minutes, significantly higher than the year-to-date average weekday TTT performance of 38 minutes. It is clear how TTT remained high towards the later stages of the day, even when HGV transactions reduced – this is because the disruption persists throughout the day due to the unproductive movements and knock-on impacts across the system.

4.2.12 Furthermore, it is noted that TTT only measures time spent in the Port from entering and exiting the entrance gate – HGVs may also experience delays queuing at the entrance gates, queuing to access the SRN, or if waiting off-site for their revised booking slot (if they missed their original booking slot).

4.2.13 It should be noted that most disruption will resolve over a 24-hour period, where drivers will cancel their booking and re-book for the following day. However, if disruption were to occur on a daily basis, disruption would be likely to become extremely difficult to manage and unacceptable for the Port and its customers as it would quickly result in a consequential increase in missed and cancelled bookings, higher stack density in the yard, more unproductive moves and fewer VBS bookings available.

Figure 4.2 – high levels of demand at 06:00 cause delays resulting in average TTT rising above 60 minutes (the time of an allocated booking slot) by 08:00, and not returning below 60 minutes for the rest of the day (even when demand significantly reduces from 18:00 onwards)

Hourly HGV arrivals and average TTT on 1st March 2022 (day where the Port experienced internal congestion), compared against internal TTT targets and the time allocated for a booking slot (60 minutes)



Source: DP World, 2023. Internal data

Highway congestion caused by the Project

4.2.14 An assessment has been undertaken to understand the economic impacts that would occur if the type of internal disruption outlined above increased in frequency due to Project-induced congestion based on the transport modelling results presented in **DTA Report**.

4.2.15 DTA have undertaken an initial detailed junction modelling using the software package LinSig. A number of modelling scenarios have been created to investigate the possible impact of the Project on Manorway Roundabout. A brief summary is found in **Table 4.1**.

Table 4.1 – LinSig modelling scenarios

Scenario name	Description / assumptions
Do-Minimum (DM)	• Project not implemented.
Do-Something (DS)	• Project implemented.
Do-Something Orsett Cock Displacement (DS-U)	• DS assumptions with additional vehicles added to the LinSig model to highlight the implications of traffic being displaced from the capacity constrained Orsett Cock Roundabout to Manorway Roundabout.
Do-Something Dartford Crossing Disruption (DS-DCD)	• DS-U assumptions with additional vehicles added to the LinSig model to represent the implications of frequent disruption at Dartford Crossing.

4.2.16 A summary of how the Project puts additional strain on Manorway Roundabout, for the time periods and junction arms most important for Port-related movements, is displayed in **Table 4.2**. These results clearly demonstrate how implementation of the Project puts significant strain on Manorway Roundabout for Port-related movements. Impacts become more severe as traffic is added through the scenarios. This demonstrates the sensitivity of the junction to increases in traffic.

4.2.17 Furthermore, paragraph 3.1.1 of the **DTA Report** details how in many cases, V/C ratios on the A13 mainline between Orsett Cock Roundabout and Manorway Roundabout exceed 85%.

Table 4.2 – V/C ratio greatly increases as the Project is implemented. This results in major adverse impacts (increase to >95% V/C) in the AM and PM in both the DS-U and DS-DCC scenarios

V/C ratios of Port related movements at Manorway Roundabout

Scenario	V/C Ratio	
	AM – A13 South (northbound direction) approach	PM – A1014 approach
DM	68%-75%	84%-92%
DS	85%-85%	91%-96%
DS-U	97%-98%	93%-101%
DS-DCD	108%-108%	93%-104%

Note: Ranges are presented, as V/C varies dependent on the specific entry lane.

The likelihood of Project-caused highway congestion resulting in internal port disruption

4.2.18 V/C ratio is a particularly pertinent measure for understanding possible disruption to the Port. This is because V/C is an indicative measure of travel time reliability. Once V/C exceeds 85%, travel times become unreliable, and the unreliability further increases as V/C increases (see paragraph 3.1.4 of **DTA Report**).

4.2.19 This is relevant for Port related movements due to the importance of reliable travel times in the logistics sector. Consistent delays can be factored into hauliers' travel planning, with drivers leaving slightly earlier to ensure they still arrive at their allocated booking slot on time (albeit consistent delays do still have an economic impact on hauliers through general decreases in HGV utilisation). Travel time unreliability and variability is a far more important consideration for the likelihood of hauliers missing booking slots.

4.2.20 Unexpected increases in travel time in comparison to what hauliers had planned could cause HGV drivers to arrive at London Gateway later than they had expected, thus missing their allocated booking slot. London Gateway are strict in ensuring HGVs arrive inside their allocated booking slots (and it is indeed a term of the HEO consent) – if an HGV is late they miss their slot and have to re-book. Therefore, even relatively modest increases in travel time variability could result in HGVs missing their allocated booking slots. Furthermore, HGVs arriving earlier can also create inefficiencies by putting unnecessary pressure on waiting facilities.

4.2.21 The frequency with which a DS-DCD scenario would materialise is a slightly more complex issue. Paragraph 3.2.7 of the **DTA Report** outlines how the **Need for the Project** presents data suggesting that on an average day, incidents at the Dartford Crossing result in the closure of ten Dartford Crossing lanes per day, with an average duration of 10 minutes per day. This resulted in an impact on traffic flows for an average of 1.5 hours every day in 2019.

4.2.22 Paragraphs 3.2.10 – Paragraph 3.2.12 of the **DTA Report** outlines the methodology for developing the DS-DCD scenario and confirms it is a likely daily event.

4.2.23 The DS-DCD scenario exhibits very high V/C ratios. V/C ratio, however, is simply an indication of travel time reliability. There is no robust methodology for estimating the actual quantitative extent of travel time variance from V/C ratios alone. Furthermore, LinSig – the software package used in the **DTA Report** – does not output any data on travel time variability. This limits the extent to which the likelihood of booking slots being missed can be determined. Furthermore, whether booking slots are missed will also be dependent upon the amount of contingency that hauliers build into their travel planning, which can vary between haulier companies.

4.2.24 However, in the absence of this information, it is noted that hauliers missing their booking slots is something that can occur when external factors result in reduced reliability, and is something which can result in internal port disruption if it occurs sufficiently regularly. Therefore, it is reasonable to develop a range of scenarios to understand the potential economic harm that could occur under different assumptions.

4.2.25 For illustrative purposes at this stage a range of conservative scenarios have been developed. These scenarios assume that the high levels of congestion and travel time unreliability observed at Manorway Roundabout lead to internal port disruption on 5%, 10%, and 25% of annual weekdays. Given the very high V/C ratios of the DS-DCD scenario, this indicative range of scenarios is judged as very conservative.

4.2.26 It should be noted, however, that receipt of the Applicant's Vissim models, a software package which has far greater functionality with respects to modelling travel time variability, would facilitate further interrogation of the travel time reliability and variability through Manorway Roundabout. This would facilitate a stronger quantitative link between available transport modelling outputs and the inputs to the economic modelling. This has been covered in the DTA Report.

Estimating the potential scale of negative economic impact of port disruption

4.2.27 **Figure 4.2** has provided an illustration of how disruption can lead to TTT delays which persist across the day, and **paragraph 4.2.11** explained that events like this are currently relatively infrequent. Since the start of January 2023, there have only been a handful of such days where the port has experienced internal disruption which has caused average TTT to rise above the internal target of 45 minutes. On these days, TTT was 47.8 minutes, 10.0 minutes above the equivalent year-to-date average weekday TTT of 37.7 minutes. In line with the reasoning outlined in **paragraph 4.2.25**, below, **indicative** scenarios have been developed where such an increase in average TTT is assumed to occur an additional 5%, 10%, and 25% of working days of the year. On these days (in line with existing data) it is assumed that there is an average 10.0 minutes increase in TTT in comparison to the baseline conditions. Again, and although such an exercise can only be indicative at this stage, the economic disbenefit associated with this increase in TTT is monetised through the following three possible methodologies.

- £ per minute from DCO – **the Need for the Project** quotes a stakeholder claiming that it costs £1 per minute to operate an HGV;
- £ per minute from Front Runner Logistics – publicly available rates for HGV logistics services;[39] and
- £ per minute from "Understanding the UK Freight Transport System" – £ per hour HGV operating cost assumed in the UK Government paper "Understanding the UK Freight Transport System".[40]

4.2.28 **Table 4.3** outlines the key assumptions for calculating the economic disbenefit related to port disruption.

Table 4.3 – calculation assumptions for potential economic harm of port disruption

Assumption	Value	Comment
(1) – Assumed 2030 daily (weekday) Port-related HGV transactions	2,615 HGV transactions	Assumed daily (weekday) Port-related HGV traffic from LDO1 Transport Assessment.
(2) – Assumed increased TTT following port disruption	10.0 minutes	As per **paragraph 4.2.27**.
(3a) – £ per minute from DCO (2030 forecast year, 2010 prices)	£52.91 per hour	As per **paragraph 4.2.27**.
(3b) – £ per minute from Front Runner Logistics (2030 forecast year, 2010 prices)	£37.33 per hour	As per **paragraph 4.2.27**.
(3c) – £ per minute from "Understanding the UK Freight Transport System" (2030 forecast year, 2010 prices)	£28.06 per hour	As per **paragraph 4.2.27**.
(4a) – Number of weekdays per year under 5% assumption	13 days	As per **paragraph 4.2.25**.
(4b) – Number of weekdays per year under 10% assumption	25 days	As per **paragraph 4.2.25**.
(4c) – Number of weekdays per year under 25% assumption	63 days	As per **paragraph 4.2.25**.

Note: £ per hour unit values will differ from their source given the forecast year and price base has changed.

4.2.29 The economic disbenefit associated with internal port disruption, monetised through the cost of increased TTT for hauliers, is calculated by combining the above assumptions. That is, multiplying (1) by (2) by (3a), (3b), or (3c) (scenario dependent), by (4a), (4b), or (4c) (scenario dependent). This calculates the annual economic harm of potential internal port disruption (in a 2030 forecast year, 2010 prices). Monetised values have then been profiled over a 60-year appraisal period, discounted, and expressed as a Net Present Value

[39] Front Runner Logistics Ltd, 2023. Dedicated Vehicle Rates

[40] See footnote 2 of Government Office for Science, 2019. Understanding the UK Freight Transport System

(NPV) in 2010 prices. This is consistent with TAG and the methodology for presenting economic impacts of the Project reported in the **EAR**. The results of this methodology are presented in **Table 4.4**.

4.2.30 NPV impacts for internal port disruption (reflected by increased TTTs) are between -£17.7m and -£166.8m (NPV, 2010 prices). For providing some context of the relative magnitude of these impacts, this range is comparable in magnitude to the total additional collisions disbenefits of the Project which is reported in the **EAR** as -£67.8m.

Table 4.4 – monetised impact ranges of increased TTT under a number of conservative scenarios (NPC, 2010 prices)

Scenario	5% assumption	10% assumption	25% assumption
£ per minute from DCO	-£33,369,000	-£66,739,000	-£166,847,000
£ per minute from Front Runner Logistics	-£23,545,000	-£47,089,000	-£117,723,000
£ per minute from "Understanding the UK Freight Transport System"	-£17,696,000	-£35,392,000	-£88,480,000

4.2.31 Increased TTT provides a basis upon which to assess and quantify economic impact, but it should be noted that increased TTTs would also have a number of knock-on economic impacts, such as:

- Additional costs for DPWLG created through operational inefficiencies;
- Delays at a container's UK destination resulting in further inefficiencies, higher labour costs etc; and
- Inefficiencies and additional costs for hauliers.

4.2.32 These impacts have not been quantified due to their intrinsic uncertainty.

4.3 Constraining economic growth

4.3.1 The high levels of travel time unreliability through Manorway Roundabout, stemming from the high V/C ratios presented in **Table 4.2**, risk giving the perception that London Gateway has unreliable access. The importance of reliable travel times for users of London Gateway Port has been made clear throughout this chapter. However, reliable travel times will also be important for tenants and prospective developers of the Logistics Park. Goods require free flowing, uninterrupted, reliable movement to and from the Logistics Park to ensure they arrive at destinations at agreed times (and thus minimising the risk of unnecessary labour costs when workers are stood around waiting for goods to arrive past the agreed time).

4.3.2 Therefore, Manorway Roundabout having the reputation of an unreliable access junction has the risk of deterring investors from developing sites at the Logistics Park. It only takes small delays to sites coming forward for relatively significant negative consequences to occur to Thurrock's economic growth, as is demonstrated in the below assessment.

4.3.3 For example, following only a one or five year delay to the build out of 5% of London Gateway's remaining commercial floorspace (under LDO1), there is the possibility of Thurrock's economy losing out on -£17.3m and -£80.9m of growth. The methodology for how these values are derived is presented in **Table 4.5**.

4.3.4 The motivation for the delay assumptions of one and five years align with the timescales of the Applicant's monitoring reports (see **Figure 3.1**). This demonstrates the potential scale of economic harm which could occur in the time where Manorway Roundabout is undergoing management and monitoring (as per the

Applicant's **M&M Plan**) but not receiving the required mitigation scheme. In reality this timeframe could still be viewed as conservative, as this is only the time taken for monitoring, whereas in reality further time would be lost due to the need to then develop a mitigation intervention, produce a business case, get funding and deliver it.

4.3.5 Additionally, London Gateway's location in the Thames Freeport, with many of the Logistics Park plots being designated Freeport tax sites,[41] means that Thurrock Council will be able to retain 100% of business rates growth above an agreed baseline.[42] As such, the constraining of growth at London Gateway Logistics Park would have further economic implications for the revenue of Thurrock Council and their ability to use such revenue to invest in regeneration and infrastructure to support further growth.

4.3.6 Furthermore, this monetised assessment has focused on the impacts of constraining Logistics Park growth, however the unreliable travel times through Manorway Roundabout could also deter investors from using the Ports services. In the short-to-medium term, this could result in hauliers using less cost-effective routes (including European transhipping) – a cost that would eventually get passed down to the end user.

Table 4.5 – derivation of potential economic loss from constrained Logistics Park growth

Description	Value	Source
Remaining London Gateway Logistics Park commercial floorspace buildout as per LDO1. (1)	549,500 sqm (GEA)	**Figure 2.3** and a 1/95% conversion factor from GIA to GEA as per the Density Guide.[43]
Percentage of remaining London Gateway buildout assumed to be delayed because of Manorway Roundabout access perception issues. (2)	5%	Indicative conservative assumption.
Remaining London Gateway buildout assumed to be delayed because of Manorway Roundabout access perception issues. (3)	27,500 sqm (GEA)	(1) * (2)
Assumed logistics space FTEs per sqm GEA (4)	77	Homes & Community Agency, 2015. Employment Density Guide 3rd edition
Assumed FTEs for which delivery is delayed (5)	357	(3) / (4)
Assumed jobs for which delivery is delayed (6)	380	Incorporating assumptions on observed part time working patterns in Thurrock's logistics industry.
Assumed Thurrock Logistics GVA per worker (2023 forecast year and 2023 prices) (7)	£69,795	ONS GVA data and BRES.[44]

[41] HM Revenue & Customs, 2022. THAMES FREEPORT - ALL TAX SITES AND FREEPORT BOUNDARY. Retrieved from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1081136/Thames_Freeport.pdf accessed July 2023

[42] Department for Levelling Up, Housing and Communities, 2023. Freeports. Retrieved from https://www.gov.uk/guidance/freeports accessed July 2023

[43] Homes & Community Agency, 2015. Employment Density Guide 3rd edition

[44] ONS, 2023. Regional gross value added (balanced) by industry: all International Territorial Level (ITL) regions; ONS, 2022. BRES 2021

Description	Value	Source
5% London Gateway remaining LDO1 commercial land annual GVA (2023 forecast year and 2023 prices) (8)	£26,544,000	(6)*(7)
5% London Gateway remaining LDO1 commercial land annual GVA (2030 forecast year and 2010 prices) (9)	£22,020,000	
Potential economic loss under a one-year delay (NPV) (10)	-£17,308,000	- (9) * 1 followed by application of discounting to convert to NPV
Potential economic loss under a five-year delay (NPV) (11)	-£80,881,000	- (9) * 5 followed by application of discounting to convert to NPV

4.3.7 As well as having economic implications for the Project, there are also strategic implications in relation to the Project's objectives. An objective of the Project, clearly stated in **The Need for the Project**, is as follows:

"To support sustainable local development and regional economic growth in the medium to long term."

4.3.8 The above evidence has clearly demonstrated that the Project, in its current unmitigated form, has the real potential to cause severe risks to the local development and economic growth of Thurrock, undermining the Project's objectives in this key respect. The **DTA Report** sets out mitigation proposal that could form the basis of a scheme that would resolve the issues identified in **Table 4.2** and thus ensure future economic growth is not constrained. On the assumption that further modelling and analysis confirms DTA's initial assessment, mitigation should be a clear priority of the Project with respect to the operation of the Port and Logistics Park, and its supply chain.

4.4 Conclusions – economic impact assessment and the VfM of mitigation

4.4.1 The potential scale of possible negative economic impacts following disruption to Manorway Roundabout caused by the Project has been demonstrated throughout this chapter and is summarised in **Table 4.6**. This has been captured by both the negative impacts of internal port disruption (reflected in increased TTT), and the potential for constrained economic growth at London Gateway.

Table 4.6 – summary of potential economic harm caused by the Project on London Gateway

Summary of internal port disruption economic harm (increased TTTs) (NPV, 2010 prices)

Scenario	5% assumption	10% assumption	25% assumption
£ per minute from DCO	-£33,369,000	-£66,739,000	-£166,847,000
£ per minute from Front Runner Logistics	-£23,545,000	-£47,089,000	-£117,723,000
£ per minute from "Understanding the UK Freight Transport System"	-£17,696,000	-£35,392,000	-£88,480,000

Summary of economic harm caused by constraining 5% of London Gateway Logistics Park's future growth (NPV, 2010 prices)

Scenario	5% of London Gateway Logistics Park's future growth constrained
One-year delay	-£17,308,000
Five-year delay	-£80,881,000

Summary of total economic harm (addition of above two tables) (NPV, 2010 prices)

Scenario		5% assumption	10% assumption	25% assumption
£ per minute from DCO	One-year delay	-£50,677,000	-£84,047,000	-£184,155,000
£ per minute from Front Runner Logistics	One-year delay	-£40,853,000	-£64,397,000	-£135,031,000
£ per minute from "Understanding the UK Freight Transport System"	One-year delay	-£35,004,000	-£52,700,000	-£105,788,000
£ per minute from DCO	Five-year delay	-£131,558,000	-£164,928,000	-£265,036,000
£ per minute from Front Runner Logistics	Five-year delay	-£121,734,000	-£145,278,000	-£215,912,000
£ per minute from "Understanding the UK Freight Transport System"	Five-year delay	-£115,885,000	-£133,581,000	-£186,669,000

4.4.2 Detailed design for proposed mitigation proposals at Orsett Cock Roundabout and Manorway Roundabout has not been undertaken by the Applicant. However, for the purposes of this economic assessment, the simplistic assumption is made that the presented negative economic impacts would essentially be resolved by implementation of appropriate mitigation measures. The **DTA Report** provides a concept of the possible scale of works that could provide appropriate mitigation to address the capacity issues.

4.4.3 The negative economic impacts presented in **Table 4.6** can be viewed as a positive impact of a mitigation proposal, with these impacts compared against likely mitigation proposal costs, to understand the BCR and VfM of such proposals. A formal costing exercise cannot be undertaken until the appropriate scheme has been identified and defined. For the purposes of this indicative exercise, it has been assumed that the cost of such mitigation proposals would be in the order of £50m in 2023 prices. Therefore, a range of £40m-£60m in 2010 prices has been tested.

4.4.4 **Table 4.7** displays the outcomes of this BCR exercise. The first table only captures benefits related to increased HGV operating times, and thus can be thought of as the mitigation proposal's initial BCR. The second and third tables capture benefits related to changes in land use resulted from the Project and hence can be thought of as an adjusted BCR.

4.4.5 Technically in assessment terms, monetising lost GVA in this way cannot be included in VfM calculations because displacement is assumed to be 100% at the national level (i.e. if economic growth is constrained here it is assumed that it will instead occur somewhere else in the UK). However, there are two reasons why it would be reasonable to diverge from these assumptions and include these impacts – the first one relates to study areas and the second to the type of economic growth. Both factors combine to emphasis the uniqueness of the Port and Park within the UK economy.

4.4.6 Firstly, because regional economic growth is an objective of the scheme, then it is appropriate to consider displaced / lost / delayed regional economic growth as a disbenefit of the scheme. Secondly, given the nature of economic growth being constrained, it is reasonable to assume that this cannot simply just occur elsewhere as it has location specific requirements (demonstrated through the strength of this area's LQ - see section **The need to support logistics clusters** in **Chapter 2**). Given the area has a unique offering in terms of location, deep sea and the type of logistics space this will support, it is likely that some of this lost / delayed growth will be felt at the national level, and therefore it is appropriate to capture as a disbenefit of the Project in this way.

4.4.7 Where initial BCRs are greater than the Project's initial BCR of 0.48, or adjusted BCRs are greater than the Project's adjusted BCR of 1.22, this has been highlighted in green. It should be noted that these BCRs are all underestimates as they only capture the effects of resolved TTT delays and resolving constraining economic growth. Mitigation proposals will have a range of positive benefits on existing highway users, most notably improved travel times. Understanding these impacts would require a full TAG transport and economic appraisal. It is likely that the results of such an appraisal would significantly increase the BCRs shown below.

4.4.8 In the majority of occasions, and even under these conservative assumptions, the mitigation proposals' BCR is greater than the corresponding Project BCR. The combined impact of a mitigation proposal resolving TTT issues, and preventing the five year delay of 5% of London Gateway's remaining developable land, results in VfM of above 2 in almost all scenarios. This is considerably higher that the Project's BCRs, and would represent 'good' VfM.

4.4.9 Furthermore, it is noted that the DS-DCD scenario assumes that a proxy of only an extra 200 vehicles per hour are diverted to Manorway Roundabout (in addition to the extra 200 vehicles per hour already assumed in the DS-U scenario) following disruption to the Dartford Crossing (consistent with a relatively limited severity, and thus frequent, event at Dartford Crossing - see Table 4 of **DTA Report**). If more detailed modelling by the Applicant confirmed this diversionary effect is higher (as would likely be the case for higher severity events including full closures), then the transport impacts would become disproportionately worse (paragraph 2.3.29 of **DTA Report**). In terms of the economic assessment, this would provide a basis for assuming relatively higher assumptions in the analysis (such as the percentage of days where port disruption occurs, and percentage and timescales for delays to the Logistics Park land being developed) which would result in higher economic impacts, and in turn higher BCRs.

4.4.10 There is therefore a clear economic and strategic case for implementing mitigation for the Project's impacts on Orsett Cock Roundabout and Manorway Roundabout. **Chapter 2** outlines the strategic importance of London Gateway to the UK economy, and therefore the case for protecting this strategic importance through mitigation proposals.

4.4.11 This chapter has outlined that under many scenarios, there is a VfM case for implementing a mitigation proposal, even under conservative BCR assumptions. This presents a strong strategic and economic rationale for mitigation.

Table 4.7 – The BCR of mitigation proposals is higher than the corresponding Project BCR in the majority of scenarios

Inclusion of Increased TTT impacts

Scenario	(5%)	(10%)	(25%)	(5%)	(10%)	(25%)
	£40m cost			£60m cost		
£ per minute from DCO	0.83	1.67	4.17	0.56	1.11	2.78
£ per minute from Front Runner Logistics	0.59	1.18	2.94	0.39	0.78	1.96
£ per minute from "Understanding the UK Freight Transport System"	0.44	0.88	2.21	0.29	0.59	1.47

Inclusion of Increased TTT impacts and one year of constrained growth at 5% of London Gateway's remaining developable Logistics Park land

Scenario	(5%)	(10%)	(25%)	(5%)	(10%)	(25%)
	£40m cost			£60m cost		
£ per minute from DCO	1.27	2.10	4.60	0.84	1.40	3.07
£ per minute from Front Runner Logistics	1.02	1.61	3.38	0.68	1.07	2.25
£ per minute from "Understanding the UK Freight Transport System"	0.88	1.32	2.64	0.58	0.88	1.76

Inclusion of Increased TTT impacts and five years of constrained growth at 5% of London Gateway's remaining developable Logistics Park land

Scenario	(5%)	(10%)	(25%)	(5%)	(10%)	(25%)
	£40m cost			£60m cost		
£ per minute from DCO	3.29	4.12	6.63	2.19	2.75	4.42
£ per minute from Front Runner Logistics	3.04	3.63	5.40	2.03	2.42	3.60
£ per minute from "Understanding the UK Freight Transport System"	2.90	3.34	4.67	1.93	2.23	3.11

5. Summary and conclusions

5.1.1 London Gateway has been demonstrated as a critically important economic and strategic asset for the UK.

5.1.2 The Project, as evidenced by the DCO submission documents, has a poor / low BCR in any event, but the DCO submission has not adequately or explicitly considered the Project's impact on London Gateway's Port and / or Logistics Park. The Project, as evidenced by the DCO submission documents, has a poor / low BCR. The DCO submission has not adequately or explicitly considered the Project's impact on London Gateway's Port and Logistics Park. Appropriate consideration of London Gateway could further undermine the Project's BCR and therefore further add to the case for mitigation to be included to ensure it does not adversely impact the current and future economic activity of London Gateway.

5.1.3 Nearly all the Project's claimed economic benefits rely upon outputs from the LTAM, the adequacy of which is challenged in the **DTA Report**, in terms of the accuracy of the modelling at Manorway Roundabout, Orsett Cock Roundabout, and the A13, and in terms of the lack of a scenario which models disruption at the Dartford Crossing. Even with these inadequacies, the Project's own modelling concludes significant adverse impacts at Manorway Roundabout at certain times of day. This shows that it is likely one of the most sensitive parts of the highway network, which is the only access to the Port and Logistics Park.

5.1.4 The Project claims a positive (but not quantified) assessment for the following impacts of relevance to London Gateway:

- Trade impacts (slight positive); and
- Option & non-use, which includes development potential (large positive).

5.1.5 The economic modelling set out in this report clearly challenges these conclusions. If travel time unreliability through Manorway Roundabout is increased, the Port will suffer from internal disruption which will have economic consequences. Even under very conservative assumptions (assuming the daily high levels of travel time unreliability through Manorway Roundabout result in internal port disruption on 5%, 10%, and 25% of annual weekdays) the resulting disbenefits would be between -£17.7m and -£166.8m (NPV, 2010 prices).

5.1.6 If unreliability is such that travel times cannot be accurately predicted by Port and Park users, there is a very real risk that future economic growth is constrained, and as a result of the unreliability end users could choose to use another port.

5.1.7 The Applicant's mitigation strategy is inadequate as it gives no certainty. This is also contrary to policy outlining the Applicant's responsibility for maintaining sufficient access to ports (Road Investment Strategy 2). Even in a conservative scenario whereby only 5% of future London Gateway growth is delayed for one year (highly conservative) or five years (still conservative given the timescales of monitoring and the absolving of responsibility to local authorities) this results in economic losses of -£17.3m and -£80.9m.

5.1.8 The analysis presented in this report demonstrates that, even based on highly conservative assumptions, resolving these economic disbenefits through appropriate highway mitigation proposals would strengthen the case for the Project and would be likely to deliver good VfM for the tax payer. However, it is noted that irrespective of VfM considerations, there is clear strategic rationale for delivering mitigation proposals given the importance of maintaining the resilience of access to London Gateway, in line with national policy objectives.

6. Glossary of terms

Term (and acronym is appropriate)	Description
Appraisal Summary Table Report (ASTR)	The LTC DCO document 7.7 – Appendix D – Economic Appraisal Package – Appraisal Summary Table.
Benefit-Cost Ratio (BCR)	Calculated as the Present Value of Benefits divided by the Present Value of Costs of a project. This indicates how much benefit is obtained for each unit of cost. A BCR greater than 1 indicates that the benefits of a project outweigh the costs.
Distributional Impacts Appraisal Report (DIAR)	The LTC DCO document 7.7 – Appendix D – Economic Appraisal Package – Distributional Impacts Appraisal Report.
Do-Minimum (DM)	Project not implemented (See **DTA Report** for further details)
Do-Something (DS)	Project implemented (See **DTA Report** for further details).
Do-Something Dartford Crossing Disruption (DS-DCD)	DS-U assumptions with even further vehicles added to the LinSig model to represent what would likely happen following disruption at Dartford Crossing. (See **DTA Report** for further details).
Do-Something Orsett Cock Displacement (DS-U)	DS assumptions with additional vehicles added to the LinSig model to represent the likely effect of traffic being displaced from the capacity constrained Orsett Cock Roundabout to Manorway Roundabout. (See **DTA Report** for further details).
DP World London Gateway (DPWLG)	London Gateway Port Limited, LG Park Freehold Limited and LG Park Leasehold Limited.
DTA Report	A technical note accompanying this document in the Submission of Written Representations 'Written Representation in relation to traffic impact on Behalf of DPWLG' prepared by DTA Transportation Limited.
DTA Transportation Limited (DTA)	The Transport Consultants who have produced the Written Representation in relation to Traffic Impact on Behalf of DPWLG.
Economic Appraisal Report (EAR)	The LTC DCO document 7.7 Combined Modelling and Appraisal Report – Appendix D – Economic Appraisal Package: Economic Appraisal Report.
Gross Value Added (GVA)	The value of an industry's outputs less the value of intermediate inputs used in the production process.
LinSig	Software by JCT Consultancy which allows traffic engineers to model traffic signals and their effect on traffic capacities and queuing.
Level 3 Wider Economic Impacts Report (L3WEIR)	The LTC DCO document 7.7 Combined Modelling and Appraisal Report Appendix D – Economic Appraisal Package: Level 3 Wider Economic Impacts Report .
Local Development Order (LDO)	The Logistics Park is subject to an LDO as made by Thurrock Council in November 2013 (LDO1). LDO1 permits development up to a maximum of 630,000 sqm class B8 and 199,100 sqm of classes B1(b), B1(c) and B2, subject to conditions.

Term (and acronym is appropriate)	Description
London Gateway	Used to refer to both the Logistics Park and Port elements of the London Gateway site.
Lower Thames Area Model (LTAM)	The Applicant's strategic transport model which underpins the DCO assessment of the Project.
National Highways' Road Investment Strategy 2 (RIS2)	National Highways, 2020. Road Investment Strategy 2 (RIS2): 2020-2025.
Need for the Project	The LTC DCO document 7.1 Need for the Project.
Reefer	Refrigerated container units.
Strategic Road Network (SRN)	The country's motorways and major A-roads – operated by National Highways.
The Project	The proposed A122 Lower Thames Crossing.
Transport Assessment (TA)	The LTC DCO document 7.9 Transport Assessment.
Transport User Benefit Appraisal (TUBA)	A software package that takes outputs from a strategic transport model and calculates monetised values for transport economic efficiency savings.
True deep sea	Refers to berths which can accommodate the world's largest ships and have capability to support the next generation (up to 24,000 TEUs).
Turnaround Times (TTT)	The total amount of time between an HGV entering and exiting the main gate of London Gateway Port.
Twenty-foot equivalent unit (TEU)	A standard-sized container measurement which is used to measure cargo capacity.
Value for Money (VfM)	A balanced judgment based on the Benefit Cost Ratio which brings together social costs and benefits including public sector costs over the entire life of a proposal, as well as non-monetisable benefits. The judgement is made in the context of the proposals role, in supporting government policies and strategies of which it is a part, and its fit with wider public policies.
Volume against capacity ratios (V/C)	The quantum of traffic on a given highway relative to the amount of traffic the roadway was designed to accommodate.
Wider Impacts in Transport Appraisal (WITA)	A software package which uses strategic transport model outputs and calculates static agglomeration impacts (businesses improving their productivity by benefitting from shorter travel times to one another).
Wider Network Impacts Management and Monitoring Plan (M&M Plan)	The LTC DCO document 7.12 Wider Network Impacts Management and Monitoring Plan .

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Action Points from Issue Specific Hearing 1

Action Point 4 – DPWLG's emergency system management / evacuation strategies

Interested Party Ref: 20035309

As requested by the Examination Panel at Issue Specific Hearing 1 (Action Point 4), the following provides a summary of DPWLG's emergency system management / evacuation strategies that rely upon or have implications for the surrounding road network feeding onto the proposed LTC:

- The potential for total site evacuation is limited based on possible scenarios.

- In the event of a Portside emergency that requires a halt of landside operations, all further incoming traffic will be held at gate and "Operational stack" will be enacted. In this scenario, security will manage traffic to queue on park roadways to ease potential impact on public roadways.

- Should emergency services be required, security will escort them on site from the Sorrell's roundabout and direct them through the best route. For Port incidents, this will be straight down the two-lane entrance road "Gateway drive", as this is most direct route to the main gate.

- If an incident occurs in the Logistics Park, security will also enact traffic management.

- Gates 1 and 2 (see attached plan) are available for access and egress dependent on location that emergency services are required. These are primarily for emergency vehicle access, but can be utilised to release traffic onto the western aspect of the manorway adjacent to the Sorrells roundabout when necessary. For example, the nearby gate will be opened by security and used for emergency vehicle access whereas dependent on severity traffic exiting the area can be diverted either by the usual exit on gateway drive (up to Sorrells roundabout) or onto the manorway via the alternative gate by KBC.

- Main access routes to the site depend primarily on roadways connecting via the Manorway and Sorrells roundabout, all gates and Gateway Drive filter onto the aforementioned roadways.

Appendix 1 – LDO Masterplan

Notes:
Contractors must verify all dimensions on site before commencing any work or shop drawings. This drawing is not to be scaled. Use figured dimensions only.

Subject to statutory approvals and survey.

AREAS
Building areas are liable to adjustment over the course of the design process due to the ongoing construction detailing developments.

G	Port phase note added	20.02.13	PMJS
F	Plot 4010 layout updated	19.02.13	PMJS
E	Carters lagoon increased in size, gate 3 service route shown	04.12.12	PMJS
D	Red line updated	08.11.12	PMJS
C	Red line updated	07.11.12	PMJS
B	Shunt road updated	04.11.12	PMJS
A	Updated following clients comments	01.11.12	PMJS

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Project Job Number 2632
LONDON GATEWAY

Client
DP WORLD

Drawing Title Drawing Size A1
LDO MASTERPLAN

Business Collaborator Drawing No.
LG-CTW-PRK-MPN-C10001-DRA-ART-0300

Drawn PMJS	Date 10.10.12	Scale 1/5000@A1	Cadfile 2632-300
Reviewed by TW	Drawing No. 2632-300		Rev. G