

# South Wales Trunk Road Agent

Managing and Improving  
Motorways and Trunk Roads  
through South Wales



# Asiant Cefnffyrdd De Cymru

Rheoli a Gwella'r Traffyrdd  
a'r Cefnffyrdd yn Ne  
Cymru

**SWTRA – 25/SW/CSI/005**

**9025 – M4 J23a Magor Interchange Temporary Signals**

**October 2025**



Yn gweithio ar ran  
**Llywodraeth Cymru**  
Working on behalf of the  
Welsh Government

# 9025 – M4 J23a Magor Interchange Temporary Signals

October 2025

|                                            |               |                  |     |
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## **1. Introduction**

WSP have been commissioned to undertake an assessment of potential temporary traffic signals at M4 J23a to address potential congestion impacts that may arise as a result of a 7.5 tonne weight restriction imposed on the M48 Pont Hafren / old Severn Bridge. In this scenario, vehicles above 7.5 tonnes will be required to use alternative routes, including the M4 J23a.

Vehicles over 7.5 tonnes using J23a of the M4 as an alternative route will divert via the M48 or M4, exit the M4 at J23a using the M4 westbound off slip road, undertake a u-turn manoeuvre at J23a roundabout and re-join the M4 using the M4 eastbound slip road.

The temporary traffic control solution would be implemented to improve management of vehicles at the interchange and any adjoining roads, for a period of up to 18 months (however this could be extended) whilst National Highways undertake repair / remedial works on the M48 Pont Hafren / old Severn Bridge.

This study will provide a comparison between the existing operational performance of the roundabout and a range of traffic signal layout options. Consideration will also be given to the technical requirements of a temporary signalised system.

On Tuesday 27th May 2025 the 7.5 tonne weight limit on the Pont Hafren / old Severn Bridge came into force.

### **1.1. Site Location**

Junction 23a of the M4, also known as the Magor Interchange, is a key motorway junction in Monmouthshire for traffic heading towards Newport, Cardiff and the Severn Bridge into England. It provides access to Magor and connects the M4 motorway with local roads including the A4810 and B4245. The junction is shown in Figure 1-1 and its location in relation to the Pont Hafren / old Severn Bridge is shown on Figure 1-2.



**Figure 1-1: M4 Junction 23a**



**Figure 1-2: Location Plan**



|                                                                  |                                                                                                                                                                                                   |                                                                                    |
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## **2. Traffic Survey Information**

To inform this study, classified traffic count surveys were supplied for dates between Wednesday 21st May and Saturday 7th June 2025 covering M4 junction 23a. The surveys were commissioned by the consultant Amey (working on behalf of National Highways) with Streetwise as the chosen survey provider.



### 3. Traffic Modelling

To understand the impact of providing a temporary traffic signal system to the motorway junction, traffic modelling has been undertaken using JCT's LinSig version 3 software. This software can provide a range outputs but with the key ones being:

- **DoS (Degree of saturation)** - The Degree of Saturation of the Lane. This is defined as the ratio of Flow to Capacity for the Lane. 90% is generally taken as the maximum acceptable. DoS for a lane to avoid significant performance issues on the lane.
- **MMQ (Mean Max Queue)** - It represents the maximum queue within a typical cycle averaged over all the cycles within the modelled time period.
- **Delay (Average Delay per PCU)** - The Average Delay for each PCU on the Lane averaged over the modelled time period.

Modelling has been undertaken using the AM (07:00 to 08:00 hours) and PM (16:30 to 17:30 hours) peak hour traffic flows on Thursday 5th June 2025. These were determined to be a typical weekday after the weight limit on the Pont Hafren / old Severn Bridge was implemented.

The AM and PM peak hour traffic flows for Thursday 5th June are summarised in Appendix A.

#### 3.1. Existing Layout

A full LinSig analysis of the existing roundabout layout is contained in Appendix B with a summarised results table shown in Table 3-1 below.

**Table 3-1: Summarised AM and PM Peak Hour Results for M4 J23a Existing Layout after Weight Limit Imposed**

| M4 J23a: Existing Layout<br>Thursday 5 <sup>th</sup> June 2025<br>Weekday AM and PM | AM Peak |           | PM Peak |           |
|-------------------------------------------------------------------------------------|---------|-----------|---------|-----------|
|                                                                                     | DoS     | MMQ (pcu) | DoS     | MMQ (pcu) |
| M4 Westbound off slip inside lane                                                   | 31.1%   | 0.2       | 77.5%   | 1.7       |
| M4 Westbound off slip outside lane                                                  | 29.8%   | 0.2       | 34.7%   | 0.3       |
| A4810 Inside lane                                                                   | 52.4%   | 0.5       | 35.0%   | 0.3       |
| A4810 outside lane                                                                  | 89.7%   | 4.0       | 41.1%   | 0.3       |
| M4 Eastbound off slip inside lane                                                   | 47.8%   | 0.5       | 21.1%   | 0.1       |
| M4 Eastbound off slip outside lane                                                  | 36.0%   | 0.3       | 43.5%   | 0.4       |
| Services                                                                            | 29.3%   | 0.2       | 21.0%   | 0.1       |

Based on the traffic survey data for Thursday 5th June, the existing junction layout is shown to be operating within the capacity threshold of the junction. The A4810 outside



lane however is shown to be operating close to capacity during the AM peak hour with a degree of saturation of 89.7%.

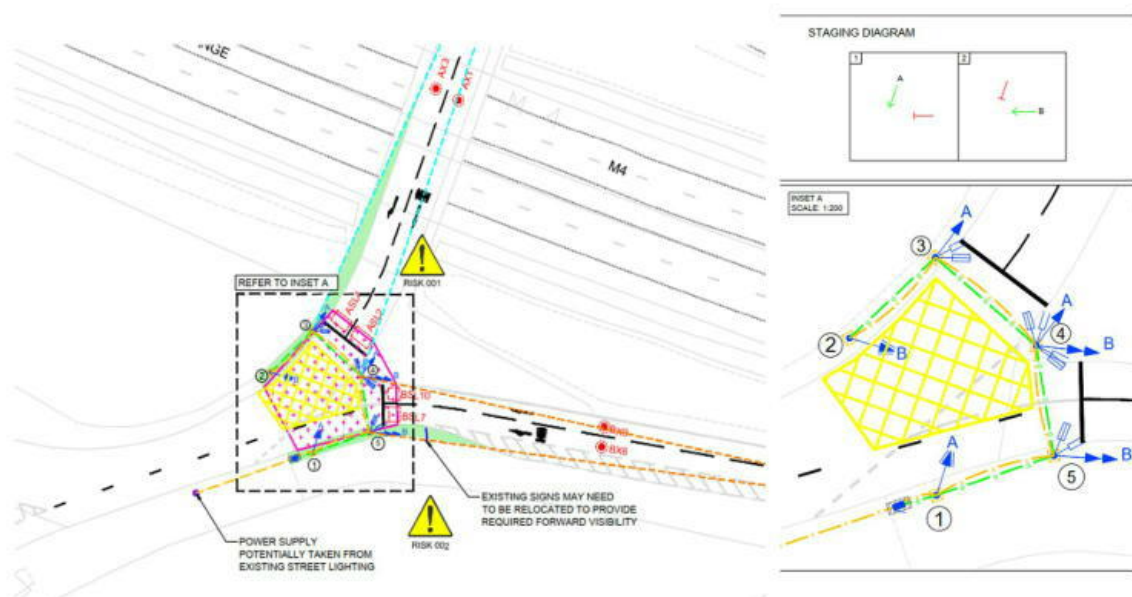
A site visit was undertaken on Tuesday 9<sup>th</sup> September 2025 to observe and validate the queues during the AM peak period. Due to an incident on the M4, traffic was queueing to exit onto the M4 from the M4 eastbound on slip road at the junction. This queue extended back through the roundabout, along the A4810 approach and through the existing signals on the A4810. This resulted in queues on all approaches to the roundabout including the M4 off slip roads.

### 3.2. Option 1 Signals at M4 Westbound Off Slip

Option 1 is to signalise the M4 westbound off-slip and adjacent circulatory carriageway.

The proposal is shown on Drawing UK0029359.3987-001 contained in Appendix C and an extract from the drawing is shown in Figure 3-1.

Figure 3-1: Extract from Option 1



The LinSig analysis of Option 1 is contained in Appendix C and the summarised results are shown in Table 3-2.



**Table 3-2: Summarised AM and PM Peak Hour Results for Option 1**

| M4 J23a: Option 1<br>Thursday 5 <sup>th</sup> June 2025<br>Weekday AM and PM | AM Peak    |           | PM Peak    |           |
|------------------------------------------------------------------------------|------------|-----------|------------|-----------|
|                                                                              | DoS        | MMQ (pcu) | DoS        | MMQ (pcu) |
| M4 Westbound off slip inside lane                                            | 34.5%      | 2.9       | 71.8%      | 8.6       |
| M4 Westbound off slip outside lane                                           | 31.3%      | 2.6       | 30.3%      | 2.6       |
| Circulating at M4 westbound off slip inside lane                             | 38.5%      | 2.9       | 70.1%      | 5.8       |
| Circulating at M4 westbound off slip outside lane                            | 23.0%      | 1.6       | 28.0%      | 1.0       |
| A4810 inside lane                                                            | 52.4%      | 0.5       | 35.0%      | 0.3       |
| A4810 outside lane                                                           | 89.7%      | 7.6       | 41.1%      | 0.3       |
| M4 Eastbound off slip inside lane                                            | 47.8%      | 0.5       | 21.1%      | 0.1       |
| M4 Eastbound off slip outside lane                                           | 36.0%      | 0.3       | 43.5%      | 0.4       |
| Services                                                                     | 29.0%      | 0.2       | 20.9%      | 0.1       |
| Cycle Time                                                                   | 50 seconds |           | 50 seconds |           |

Based on the traffic survey data for Thursday 5<sup>th</sup> June, Option 1 is predicted to operate within capacity in both AM and PM peak periods. Similarly to the existing layout the A4810 outside lane during the AM peak period is close to capacity.

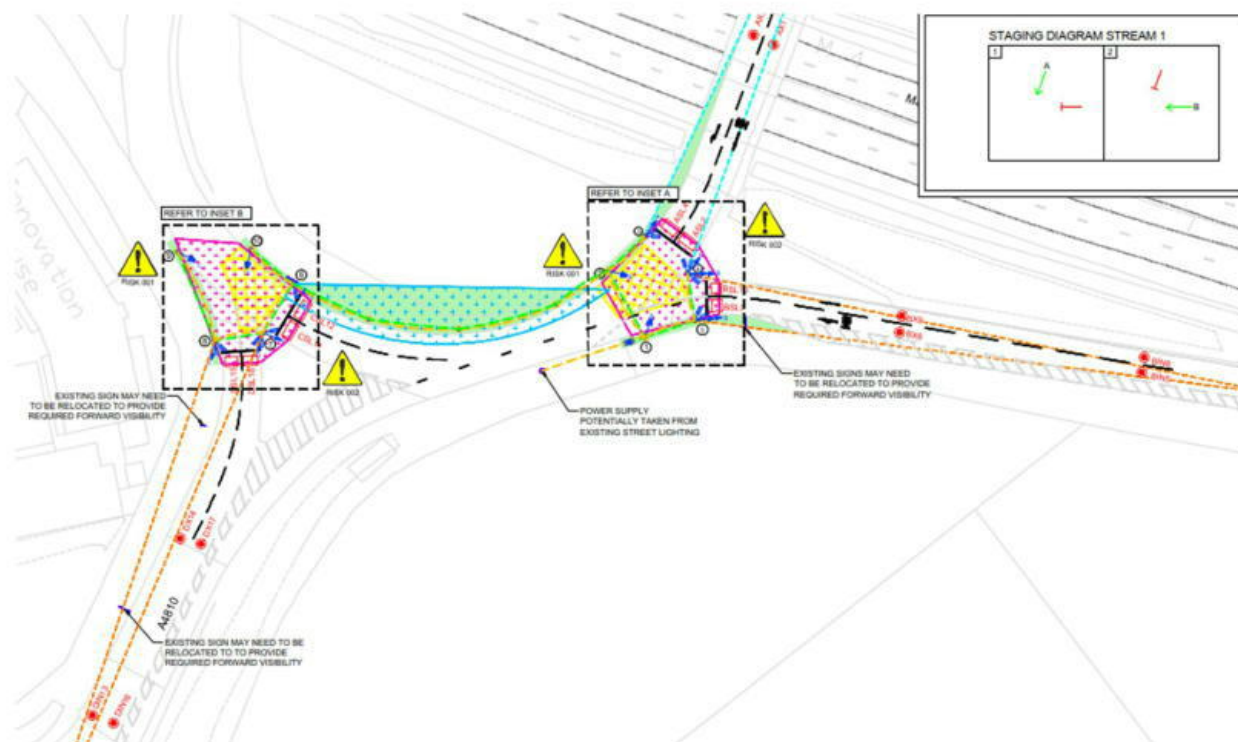
### **3.3. Option 2 Signals at M4 Westbound off Slip and A4810**

Option 2 is to signalise the M4 westbound off slip road and A4810 and adjacent circulatory carriageway approaches.

The proposal is shown on Drawing UK0029359.3987-002 contained in Appendix D and an extract from the drawing is shown in Figure 3-2.



**Figure 3-2: Extract from Option 2**



The LinSig analysis of Option 2 is contained in Appendix D and the summarised results are shown in Table 3-3.

**Table 3-3: Summarised AM and PM Peak Hour Results for Option 2**

| M4 J23a: Option 2<br>Thursday 5 <sup>th</sup> June 2025<br>Weekday AM and PM | AM Peak    |              | PM Peak    |              |
|------------------------------------------------------------------------------|------------|--------------|------------|--------------|
|                                                                              | DoS        | MMQ<br>(pcu) | DoS        | MMQ<br>(pcu) |
| M4 Westbound off slip inside lane                                            | 34.5%      | 2.9          | 71.8%      | 8.6          |
| M4 Westbound off slip outside lane                                           | 31.3%      | 2.6          | 30.3%      | 2.6          |
| Circulating at M4 westbound off slip inside lane                             | 38.5%      | 2.9          | 70.1%      | 5.8          |
| Circulating at M4 westbound off slip outside lane                            | 23.0%      | 1.6          | 28.0%      | 1.8          |
| A4810 inside lane                                                            | 44.0%      | 4.2          | 35.1%      | 3.1          |
| A4810 outside lane                                                           | 75.4%      | 10.2         | 41.2%      | 3.8          |
| Circulating at A4810 inside lane                                             | 44.4%      | 2.5          | 28.4%      | 2.3          |
| Circulating at A4810 outside lane                                            | 73.0%      | 3.5          | 52.3%      | 1.8          |
| M4 Eastbound off slip inside lane                                            | 47.8%      | 0.5          | 21.1%      | 0.1          |
| M4 Eastbound off slip outside lane                                           | 36.0%      | 0.3          | 43.5%      | 0.4          |
| Services                                                                     | 28.4%      | 0.2          | 20.6%      | 0.1          |
| Cycle Time                                                                   | 50 seconds |              | 50 seconds |              |

Based on the traffic survey data for Thursday 5th June, Option 2 is predicted to operate within capacity in both AM and PM peak periods. The A4810 outside lane is predicted to have a queue of 10 pcu's during the AM peak period but remains within theoretical capacity.

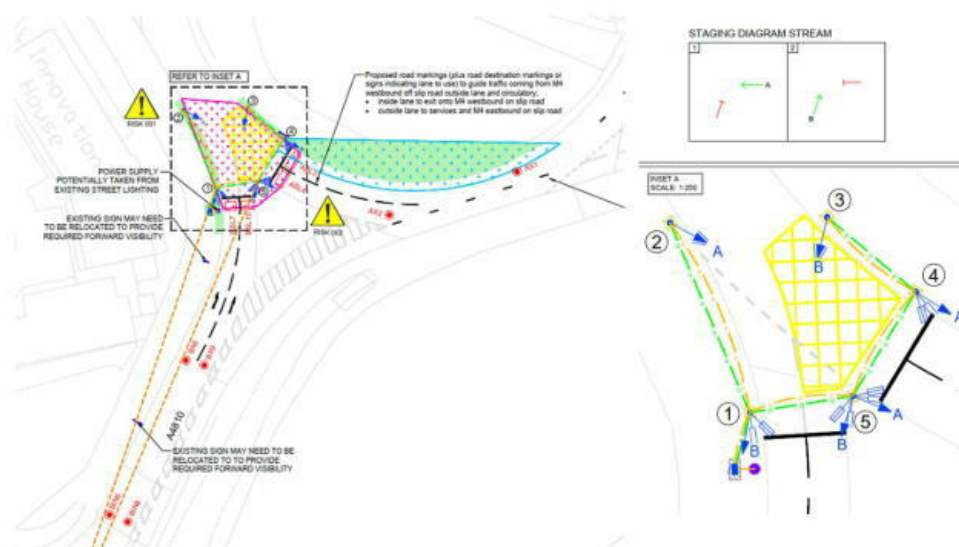
### 3.4. Option 3 Signals at A4810

Option 3 is to signalise the A4810 and adjacent circulatory carriageway approach.

The proposal is shown on Drawing UK0029359.3987-003 contained in Appendix E and an extract from the drawing is shown in Figure 3-3.



Figure 3-3: Extract from Option 3



The LinSig analysis of Option 3 is contained in Appendix E and the summarised results are shown in Table 3-4.

Table 3-4 - Summarised AM and PM Peak Hour Results for Option 3

| M4 J23a: Option 3<br>Thursday 5 <sup>th</sup> June 2025<br>Weekday AM and PM | AM Peak    |           | PM Peak    |           |
|------------------------------------------------------------------------------|------------|-----------|------------|-----------|
|                                                                              | DoS        | MMQ (pcu) | DoS        | MMQ (pcu) |
| M4 Westbound off slip Inside lane                                            | 31.1%      | 0.2       | 77.5%      | 1.7       |
| M4 Westbound off slip outside lane                                           | 29.8%      | 0.2       | 34.7%      | 0.3       |
| A4810 inside lane                                                            | 44.0%      | 4.2       | 36.6%      | 3.2       |
| A4810 outside lane                                                           | 75.4%      | 10.2      | 43.0%      | 3.9       |
| Circulating at A4810 inside lane                                             | 44.4%      | 2.3       | 26.5%      | 1.8       |
| Circulating at A4810 outside lane                                            | 73.0%      | 4.6       | 48.8%      | 3.7       |
| M4 Eastbound off slip inside lane                                            | 47.8%      | 0.5       | 21.1%      | 0.1       |
| M4 Eastbound off slip outside lane                                           | 36.0%      | 0.3       | 43.5%      | 0.4       |
| Services                                                                     | 28.4%      | 0.2       | 20.7%      | 0.1       |
| Cycle Time                                                                   | 50 seconds |           | 50 seconds |           |

Based on the traffic survey data for Thursday 5th June, Option 3 is predicted to operate within capacity in both AM and PM peak periods. The A4810 outside lane is predicted to have a queue of 10 pcu's during the AM peak period but remains within theoretical capacity.

|                                                                  |                                                                                                                                                                                                   |                                                                                    |
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### **3.5. M4 Eastbound Off Slip Road Approach**

Signalising the M4 eastbound off slip road approach was considered as part of the proposed options. The traffic survey identifies traffic flows on this approach are low. The modelling of the existing and proposed options indicates queues and delays are minimal on this approach; therefore, signal control is not proposed on the M4 eastbound off slip road approach.



#### 4. Additional Testing

It is not possible to accurately predict the exact numbers of u-turners at this roundabout resulting from the bridge closure with traffic flows and turning proportions varying. To test the robustness of the existing roundabout operation and that with traffic signals implemented, some additional sensitivity testing has also been undertaken. This testing increases the number of u-turning vehicles from the M4 westbound off slip to M4 eastbound on slip by an additional 25% and 50%.

The summarised LinSig results are shown in Tables 4-1 to 4-4.

**Table 4-1: Existing with Additional 25% and 50% U Turning Traffic**

| Existing Layout +25% & 50%<br>Thursday 5 <sup>th</sup> June 2025<br>Weekday AM and PM | Additional 25% U turners |           |         |           | Additional 50% u turners |           |         |           |
|---------------------------------------------------------------------------------------|--------------------------|-----------|---------|-----------|--------------------------|-----------|---------|-----------|
|                                                                                       | AM Peak                  |           | PM Peak |           | AM Peak                  |           | PM Peak |           |
|                                                                                       | DoS                      | MMQ (pcu) | DoS     | MMQ (pcu) | DoS                      | MMQ (pcu) | DoS     | MMQ (pcu) |
| M4 Westbound off slip inside lane                                                     | 31.1%                    | 0.2       | 77.5%   | 1.7       | 31.1%                    | 0.2       | 77.5%   | 1.7       |
| M4 Westbound off slip outside lane                                                    | 33.3%                    | 0.2       | 37.3%   | 0.3       | 36.6%                    | 0.3       | 39.7%   | 0.3       |
| A4810 inside lane                                                                     | 53.0%                    | 0.6       | 35.2%   | 0.3       | 53.6%                    | 0.6       | 35.5%   | 0.3       |
| A4810 outside lane                                                                    | 90.7%                    | 4.4       | 41.4%   | 0.4       | 91.8%                    | 4.9       | 41.7%   | 0.4       |
| M4 Eastbound off slip inside lane                                                     | 48.6%                    | 0.5       | 21.3%   | 0.1       | 49.4%                    | 0.5       | 21.5%   | 0.1       |
| M4 Eastbound off slip outside lane                                                    | 36.6%                    | 0.3       | 43.9%   | 0.4       | 37.2%                    | 0.3       | 44.3%   | 0.4       |
| Services                                                                              | 29.6%                    | 0.2       | 21.1%   | 0.1       | 29.9%                    | 0.2       | 21.2%   | 0.1       |



**Table 4-2: Option 1 with Additional 25% and 50% U Turing Traffic**

| Option 1 +25% & 50%<br>Thursday 5 <sup>th</sup> June 2025<br>Weekday AM and PM | Additional 25% U turners |           |            |           | Additional 50% u turners |           |            |           |
|--------------------------------------------------------------------------------|--------------------------|-----------|------------|-----------|--------------------------|-----------|------------|-----------|
|                                                                                | AM Peak                  |           | PM Peak    |           | AM Peak                  |           | PM Peak    |           |
|                                                                                | DoS                      | MMQ (pcu) | DoS        | MMQ (pcu) | DoS                      | MMQ (pcu) | DoS        | MMQ (pcu) |
| M4 Westbound off slip inside lane                                              | 30.2%                    | 2.6       | 71.8%      | 8.6       | 30.2%                    | 2.6       | 71.8%      | 8.6       |
| M4 Westbound off slip outside lane                                             | 30.5%                    | 2.6       | 32.5%      | 2.8       | 33.6%                    | 3.0       | 34.7%      | 3.1       |
| Circulating M4 westbound off slip inside lane                                  | 46.8%                    | 3.3       | 70.1%      | 5.8       | 46.8%                    | 3.3       | 70.1%      | 5.8       |
| Circulating M4 westbound off slip outside lane                                 | 28.0%                    | 1.8       | 28.0%      | 1.8       | 28.0%                    | 1.8       | 28.0%      | 1.8       |
| A4810 inside lane                                                              | 53.0%                    | 0.6       | 35.2%      | 0.3       | 53.6%                    | 0.6       | 35.5%      | 0.3       |
| A4810 outside lane                                                             | 90.7%                    | 8.2       | 41.4%      | 0.4       | 91.8%                    | 9.6       | 41.7%      | 0.4       |
| M4 Eastbound off slip inside lane                                              | 48.6%                    | 0.5       | 21.3%      | 0.1       | 49.4%                    | 0.5       | 21.5%      | 0.1       |
| M4 Eastbound off slip outside lane                                             | 36.6%                    | 0.3       | 43.9%      | 0.4       | 37.2%                    | 0.3       | 44.3%      | 0.4       |
| Services                                                                       | 29.3%                    | 0.2       | 21.0%      | 0.1       | 29.6%                    | 0.2       | 21.1%      | 0.1       |
| Cycle Time                                                                     | 50 seconds               |           | 50 seconds |           | 50 seconds               |           | 50 seconds |           |



**Table 4-3: Option 2 with Additional 25% and 50% U Turing Traffic**

| Option 2 +25% & 50%<br>Thursday 5 <sup>th</sup> June 2025<br>Weekday AM and PM | Additional 25% U turners |           |            |           | Additional 50% u turners |           |            |           |
|--------------------------------------------------------------------------------|--------------------------|-----------|------------|-----------|--------------------------|-----------|------------|-----------|
|                                                                                | AM Peak                  |           | PM Peak    |           | AM Peak                  |           | PM Peak    |           |
|                                                                                | DoS                      | MMQ (pcu) | DoS        | MMQ (pcu) | DoS                      | MMQ (pcu) | DoS        | MMQ (pcu) |
| M4 Westbound off slip inside lane                                              | 34.5%                    | 2.9       | 71.8%      | 8.6       | 34.5%                    | 2.9       | 71.8%      | 8.6       |
| M4 Westbound off slip outside lane                                             | 34.9%                    | 2.9       | 32.5%      | 2.8       | 38.4%                    | 3.3       | 34.7%      | 3.1       |
| Circulating M4 westbound off slip inside lane                                  | 38.5%                    | 2.9       | 70.1%      | 5.8       | 38.5%                    | 2.9       | 70.1%      | 5.8       |
| Circulating M4 westbound off slip outside lane                                 | 23.0%                    | 1.6       | 28.0%      | 1.8       | 23.0%                    | 1.6       | 28.0%      | 1.8       |
| A4810 inside lane                                                              | 45.6%                    | 4.4       | 35.1%      | 3.1       | 45.6%                    | 4.4       | 36.6%      | 3.2       |
| A4810 outside lane                                                             | 78.1%                    | 10.9      | 41.2%      | 3.8       | 78.1%                    | 10.9      | 43.0%      | 3.9       |
| Circulating at A4810 inside lane                                               | 39.9%                    | 2.5       | 28.4%      | 2.3       | 39.9%                    | 2.5       | 26.5%      | 2.3       |
| Circulating at A4810 outside lane                                              | 73.5%                    | 3.1       | 56.1%      | 1.9       | 80.9%                    | 4.2       | 55.8%      | 1.9       |
| M4 Eastbound off slip inside lane                                              | 48.6%                    | 0.5       | 21.3%      | 0.1       | 49.4%                    | 0.5       | 21.5%      | 0.1       |
| M4 Eastbound off slip outside lane                                             | 36.6%                    | 0.3       | 43.9%      | 0.4       | 37.2%                    | 0.3       | 44.3%      | 0.4       |
| Services                                                                       | 28.6%                    | 0.2       | 20.7%      | 0.1       | 28.9%                    | 0.2       | 20.8%      | 0.1       |
| Cycle Time                                                                     | 50 seconds               |           | 50 seconds |           | 50 seconds               |           | 50 seconds |           |



**Table 4-4: Option 3 with Additional 25% and 50% U Turning Traffic**

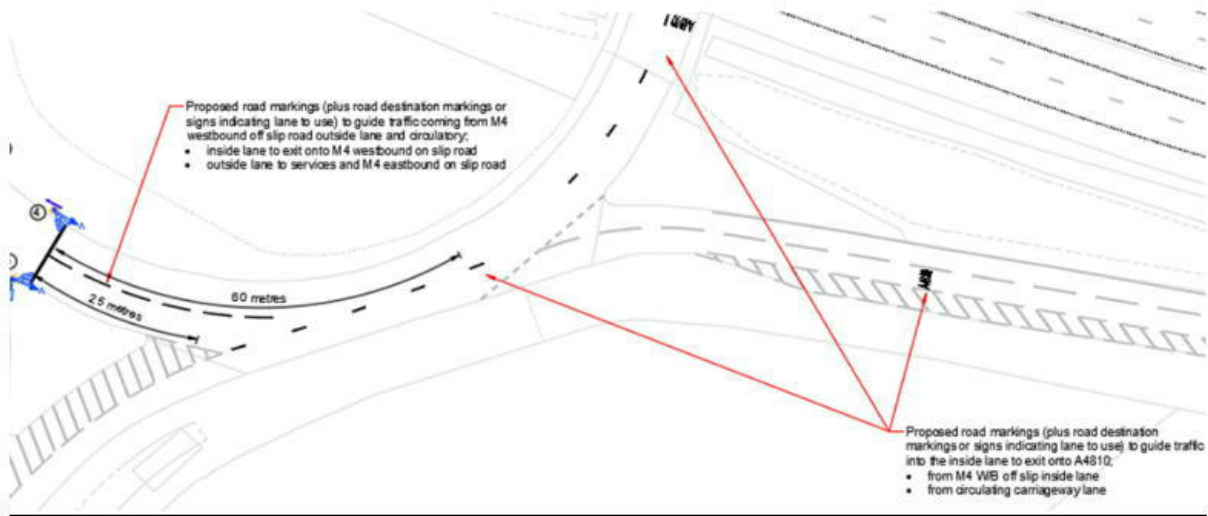
| Option 3 +25% & 50%<br>Thursday 5 <sup>th</sup> June 2025<br>Weekday AM and PM | Additional 25% U turners |           |            |           | Additional 50% u turners |           |            |           |
|--------------------------------------------------------------------------------|--------------------------|-----------|------------|-----------|--------------------------|-----------|------------|-----------|
|                                                                                | AM Peak                  |           | PM Peak    |           | AM Peak                  |           | PM Peak    |           |
|                                                                                | DoS                      | MMQ (pcu) | DoS        | MMQ (pcu) | DoS                      | MMQ (pcu) | DoS        | MMQ (pcu) |
| M4 Westbound off slip inside lane                                              | 31.1%                    | 0.2       | 77.5%      | 1.7       | 31.1%                    | 0.2       | 77.5%      | 1.7       |
| M4 Westbound off slip outside lane                                             | 33.3%                    | 0.2       | 37.3%      | 0.3       | 36.6%                    | 0.3       | 39.7%      | 0.3       |
| A4810 inside lane                                                              | 45.6%                    | 4.4       | 36.6%      | 3.2       | 45.6%                    | 4.4       | 38.3%      | 3.3       |
| A4810 outside lane                                                             | 78.1%                    | 10.9      | 43.0%      | 3.9       | 78.1%                    | 10.9      | 45.0%      | 4.0       |
| Circulating at A4810 inside lane                                               | 39.9%                    | 2.2       | 26.5%      | 1.8       | 39.9%                    | 2.2       | 24.8%      | 1.7       |
| Circulating at A4810 outside lane                                              | 73.5%                    | 5.0       | 52.4%      | 4.0       | 80.9%                    | 6.1       | 52.4%      | 4.2       |
| M4 Eastbound off slip inside lane                                              | 48.6%                    | 0.5       | 21.3%      | 0.1       | 49.4%                    | 0.5       | 21.5%      | 0.1       |
| M4 Eastbound off slip outside lane                                             | 36.6%                    | 0.3       | 43.9%      | 0.4       | 37.2%                    | 0.3       | 44.3%      | 0.4       |
| Services                                                                       | 28.6%                    | 0.2       | 20.7%      | 0.1       | 28.9%                    | 0.2       | 20.8%      | 0.1       |
| Cycle Time                                                                     | 50 seconds               |           | 50 seconds |           | 50 seconds               |           | 50 seconds |           |

With the 25% and 50% increase in u-turning traffic:

- The existing layout is predicted to operate at capacity in both AM and PM peak periods. The degrees of saturation on the A4810 outside lane increase slightly from 89.7% to 90.7% (25% more u-turners) and 91.8% (50% more u-turners).
- Option 1 similarly to the base is predicted to operate at capacity in both AM and PM peak periods. Like the existing layout, the A4810 outside lane during the AM peak periods is close to capacity.
- Option 2 is predicted to operate within capacity in both AM and PM peak periods. The A4810 outside lane is predicted to have a queue of 10.9 pcu's during the AM peak periods.
- Option 3 is predicted to operate within capacity in both AM and PM peak periods. Like Option 2, the A4810 outside lane is predicted to have a queue of 10.9 pcu's during the AM peak period. The circulating lanes at A4810 have slightly longer queues compared to Option 2. The longest predicted queue on the circulatory at A4810 approach is 6.1 pcu (approximately 35 metres) in the outside lane and 2.2 pcu (approximately 13 metres) in the inside lane. The approximate lane lengths on the circulatory are 60 metres outside lane and 25 metres inside lane as indicated on Figure 4.1. The predicted queues should be contained within the lane lengths.



**Figure 4-1: Extract from Option 3 Drawing**





## 5. Traffic Flows Before and After Weight Limit

A comparison of the daily number of vehicles approaching the M4 junction 23a from the M4 westbound off slip and exiting onto the M4 via the M4 eastbound off slip road (u turning) weighing over 7.5 tonnes (OGV1, OGV2 and buses) before and after the weight limit was introduced on the Pont Hafren / old Severn Bridge are shown in Table 5-1.

**Table 5-1: Daily number of vehicles over 7.5 tonne M4 Westbound off slip to M4 Eastbound on slip (u turning) before and after weight limit on Old Severn Bridge**

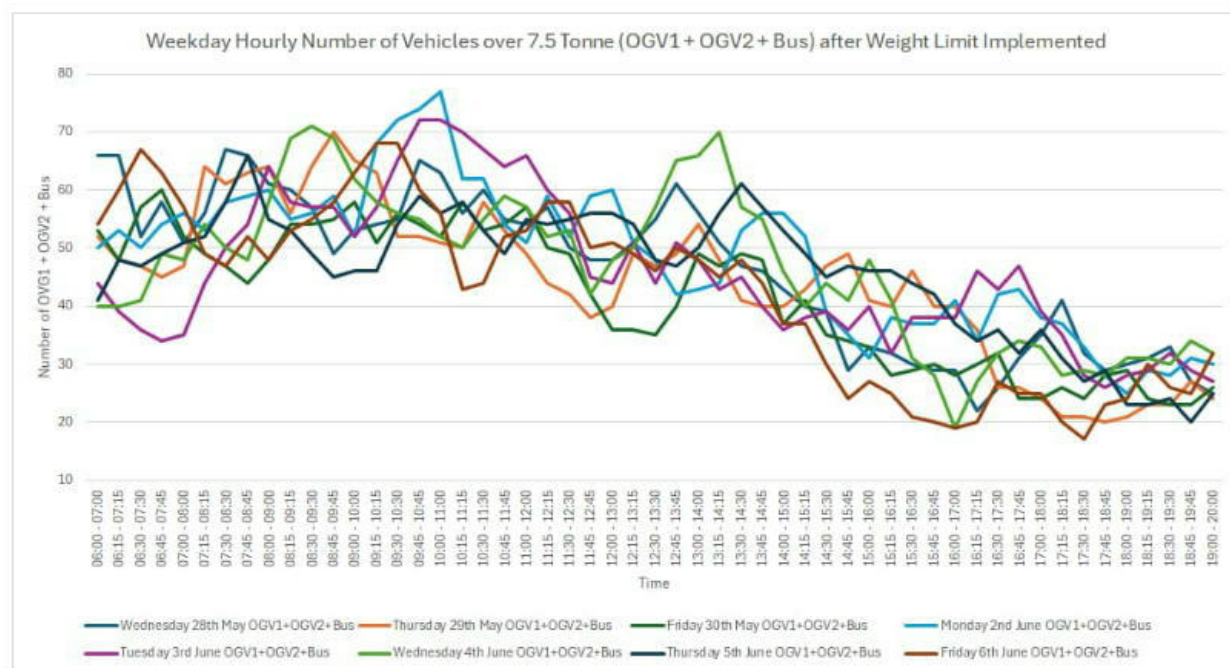
| M4 Junction 23a    | Daily Number of Vehicles over 7.5 tonne<br>M4 W/B to M4 E/B (u turning) |      |     |       |                                    |
|--------------------|-------------------------------------------------------------------------|------|-----|-------|------------------------------------|
|                    | OGV1                                                                    | OGV2 | Bus | Total |                                    |
| Wednesday 21st May | 10                                                                      | 18   | 0   | 28    |                                    |
| Thursday 22nd May  | 3                                                                       | 10   | 0   | 13    |                                    |
| Friday 23rd May    | 8                                                                       | 9    | 2   | 19    |                                    |
| Saturday 24th May  | 5                                                                       | 13   | 0   | 18    |                                    |
| Sunday 25th May    | 1                                                                       | 10   | 0   | 11    |                                    |
| Monday 26th May    | 7                                                                       | 17   | 1   | 25    |                                    |
| Tuesday 27th May   | 230                                                                     | 606  | 7   | 843   | Day weight restriction implemented |
| Wednesday 28th May | 230                                                                     | 636  | 0   | 866   |                                    |
| Thursday 29th May  | 220                                                                     | 621  | 1   | 842   |                                    |
| Friday 30th May    | 188                                                                     | 571  | 0   | 759   |                                    |
| Saturday 31st May  | 66                                                                      | 256  | 1   | 323   |                                    |
| Sunday 1st June    | 27                                                                      | 249  | 2   | 278   |                                    |
| Monday 2nd June    | 210                                                                     | 631  | 0   | 841   |                                    |
| Tuesday 3rd June   | 204                                                                     | 613  | 7   | 824   |                                    |
| Wednesday 4th June | 196                                                                     | 644  | 1   | 841   |                                    |
| Thursday 5th June  | 215                                                                     | 615  | 0   | 830   |                                    |
| Friday 6th June    | 218                                                                     | 564  | 2   | 784   |                                    |
| Saturday 7th June  | 57                                                                      | 214  | 2   | 273   |                                    |



Table 5-1 indicates less than 900 vehicles (1808 pcu) daily weighing over 7.5 tonnes undertake the u-turn manoeuvre after the weight limit came into force on the old Severn Bridge.

Figure 5-1 shows the hourly number of u-turning movements for vehicles over the 7.5 tonne weight limit after the weight limit was introduced.

**Figure 5-1: Hourly Number of Vehicles of 7.5 Tonne making the U Turn**



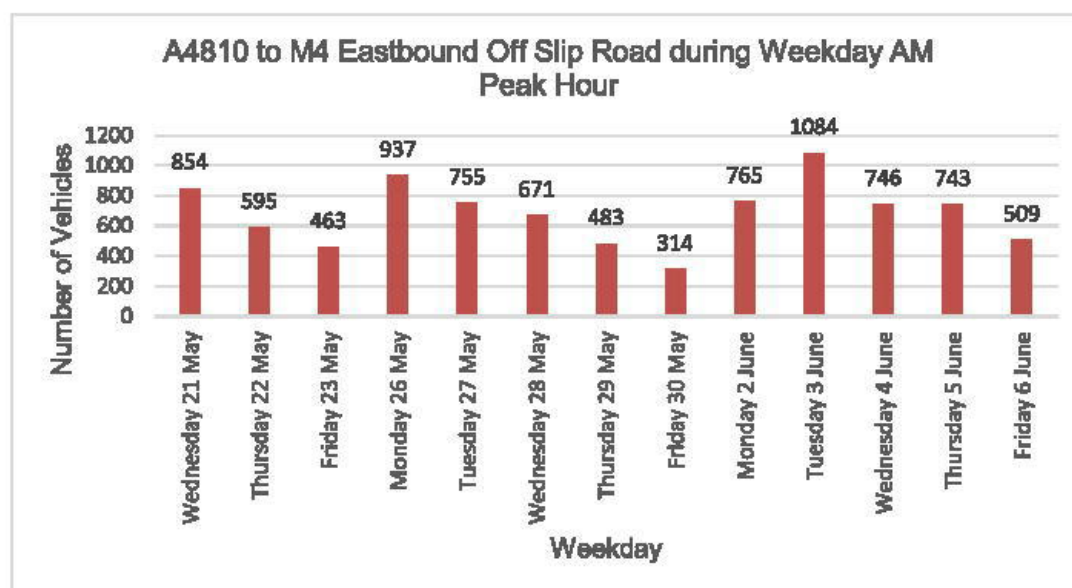
The highest weekday hourly number of u-turning movements over the 7.5 tonne weight limit after the weight limit was introduced was 77 vehicles (166 pcu) which occurred between 10:00 to 11:00 hours on Monday 2nd June.



## 6. Daily Variations In Traffic

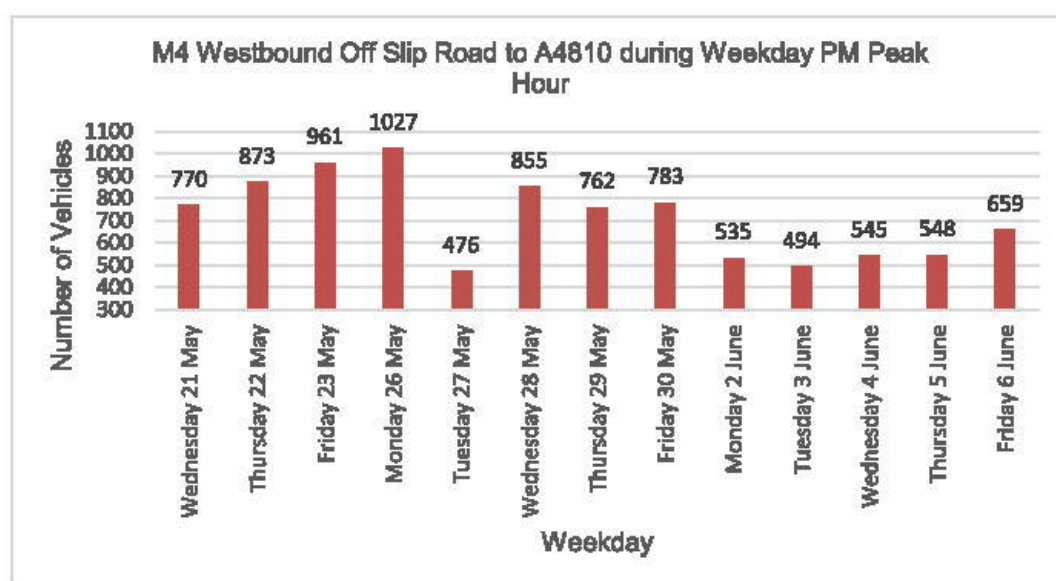
From the traffic flow data there are significant day to day variations in traffic flow (between 314 to 1084 vehicles) from the A4810 to M4 Eastbound off slip road during the weekday AM peak periods as shown in Figure 6-1.

**Figure 6-1: Weekday AM Peak Traffic Flow Variations A4810 to M4 Eastbound Slip**



From the traffic flow data there are significant day to day variations in traffic flow (between 476 to 1027 vehicles) from the M4 Westbound off slip road to A4810 during the weekday PM peak periods as shown in Figure 6-2.

**Figure 6-2: Weekday PM Peak Traffic Flow Variations M4 Westbound Off Slip to A4810**





It is assumed these significant variations are due to traffic diverting onto local routes at this junction when there is congestion on the M4.

## **7. Implementation of Temporary Traffic Signals**

A research exercise has been undertaken to identify temporary traffic signal manufacturers that could implement the required adaptive and co-ordinated temporary traffic signals.

- SRL with their Urban 64
- Traffic Group Signals
- Yunex Plus+ Advance

Based on google map imagery and Ordnance Survey data the following would be recommended as part of the temporary traffic signal installation.

- Temporary foundations for poles and controller to be provided (likely to be approximately 1000mm x 1000mm x 400m).
- Stop lines, lane lines, yellow boxes and road destination markings or temporary traffic signs to be provided indicating destinations as indicated on the drawings.
- Temporarily reducing the speed limit to 40mph via a temporary traffic regulation order (TTRO) on both SWTRA and Monmouthshire County Council roads as the current speed limit is national speed limit and the actual vehicle and 85th percentile speeds are unknown.
- Vegetation and tree trimming to provide required forward visibility to the traffic signal heads and aid in installing the above ground cables as indicated on the drawings for all options.
- A suitable off carriageway area will need to be identified / agreed with SWTRA to locate the traffic signal controller and ideally include a parking area adjacent to the controller for maintenance engineers.

Suitable power supply requirements will need to be determined once the temporary signal company has been appointed. Depending on which companies' system is implemented the power supply to the temporary signals could either be taken from existing street lighting equipment e.g. SRL's Urban 64 or powered by batteries e.g. Traffic Signal Group.

For options 1 and 2, space appears constrained for the installation of an offside primary signal pole between the edge of carriageway and back of verge / fence on the central island for the circulatory approach adjacent to the M4 westbound off slip road. If options 1 or 2 are implemented, due to the narrow verge at this location, the offside signal pole for the circulatory carriageway approach may need to be sited within the carriageway with temporary barrier protection resulting in 2 narrower traffic lanes on this approach. Further investigation/measurement of available width on site is recommended.



If temporary traffic signals are installed on the A4810 approach (Options 2 and 3), there is potential for the queue to extend back to the existing permanent signals, even though the modelling suggests the queue would not extend that far back under normal conditions. Consideration could be given to including virtual queue loops within the temporary traffic signal system on the A4810 approach (Option 2 and 3) to help prevent queues extending back to the permanent signals. Alternatively, if the temporary signal system is capable, the temporary and permanent traffic signals could be linked together, for example, an above ground linking cable could be installed between the temporary and permanent signals. Linking the signals together would require a configuration change at the permanent signals.

Whilst undertaking a site visit to support this study, eastbound traffic was witnessed to leave the M4 at or west of junction 24 due to congestion caused by a network incident. On these occasions, traffic diverts via the Newport SDR and A4810 to rejoin the M4 at J23a. This additional traffic was seen to result in queues extending back through J23a Magor, the M4 off slip roads and the permanent signals at the adjacent A4810 / Newport Road junction. In this situations where traffic queues back through the roundabout, temporary signals are unlikely to provide any material benefit to the management of the network as exit lanes will be blocked and signals unable to effectively detect vehicles and optimise timings.



## **8. Conclusion and Recommendations**

Based on the traffic survey information, the 7.5 tonne weight limit on the Pont Hafren / old Severn Bridge results in less than 900 additional vehicles (1808 pcu) daily.

77 vehicles (166 pcu) additional vehicles over 7.5 tonnes were the maximum recorded during any hour (Monday 2nd June between 10:00 to 11:00 hours) after the weight limit was implemented.

During the weekday AM and PM peak hours the maximum number of additional vehicles over 7.5 tonnes recorded were 64 (134 pcu) between 07:15 to 08:15 hours on Thursday 29th May 2025.

From the traffic survey data, the 7.5 tonne weight limit results in approximately two additional vehicles (3 pcu) a minute, which would not have a material impact on the existing junction operation.

The traffic surveys and traffic modelling indicated that traffic diverting onto this junction due to the weight restriction at the Pont Hafren / old Severn Bridge had largely an insignificant impact on the operational performance of the junction. However, if situations arose where more vehicles diverted onto this route, either through an increase in larger vehicles or general surges in demand, temporary traffic signals would enable the ability to provide better balance and coordination of both the local and trunk road network.

In respect of the LInSig traffic modelling, Option 3 would be recommended as this simplifies the traffic signal layout and provides a satisfactory operational performance in the range of tested scenarios. With the A4810 outside lane being the most constrained link, this model option provides traffic signal control and therefore more opportunity to access into the roundabout. This option however will not provide any benefit to the trunk road as will only serve to take some of the flexibility and priority away from the roundabout. Option 2, with the two sets of coordinated signals would therefore be recommended if a signalised option was to be progressed as this will allow the demands of the local and trunk road network to be balanced as the traffic conditions at the time dictate.

|                                                                  |                                                                                                                                                                                                   |                                                                                    |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| <p><b>9025 – M4 J23a Major Interchange Temporary Signals</b></p> |  <p>Yn gweithio ar ran<br/><b>Llywodraeth Cymru</b><br/>Working on behalf of the<br/><b>Welsh Government</b></p> |  |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|

## **APPENDIX A:**

### **AM and PM Peak Hour Traffic Flows**

|                                                                  |                                                                                                                                                                                                   |                                                                                     |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <p><b>9025 – M4 J23a Major Interchange Temporary Signals</b></p> |  <p>Yn gweithio ar ran<br/><b>Llywodraeth Cymru</b><br/>Working on behalf of the<br/><b>Welsh Government</b></p> |  |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|

## **APPENDIX B:**

### **Existing Layout**

|                                                                  |                                                                                                                                                                                                   |                                                                                     |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <p><b>9025 – M4 J23a Major Interchange Temporary Signals</b></p> |  <p>Yn gweithio ar ran<br/><b>Llywodraeth Cymru</b><br/>Working on behalf of the<br/><b>Welsh Government</b></p> |  |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|

## **APPENDIX C:**

### **Option 1**

|                                                                  |                                                                                                                                                                                                   |                                                                                                                                           |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>9025 – M4 J23a Major Interchange Temporary Signals</b></p> |  <p>Yn gweithio ar ran<br/><b>Llywodraeth Cymru</b><br/>Working on behalf of the<br/><b>Welsh Government</b></p> |  <p>Adiant Cymherdd De Cymru<br/>South Wales Trusts</p> |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|

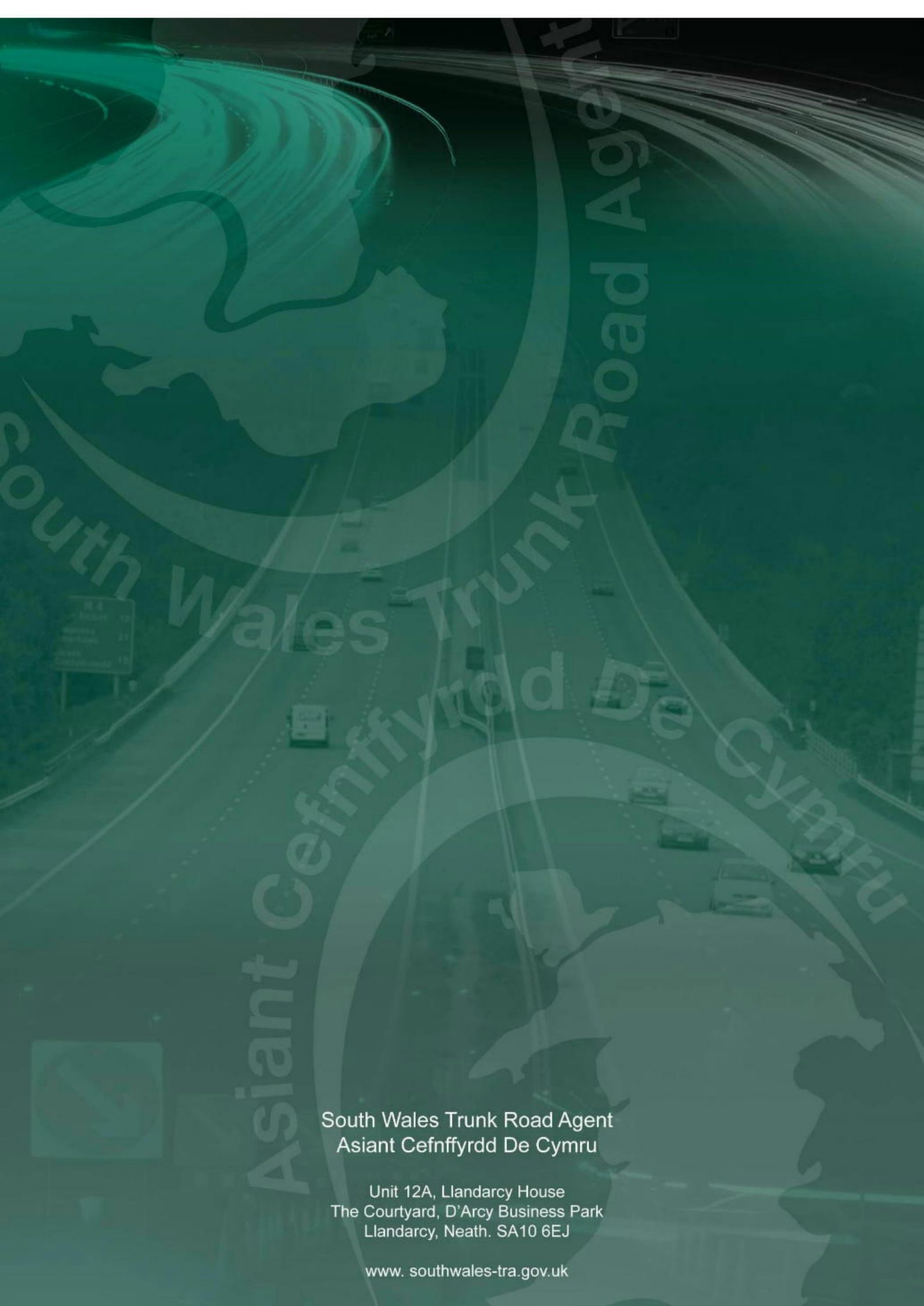
## **APPENDIX D:**

### **Option 2**

|                                                                  |                                                                                                                                                                                                   |                                                                                     |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <p><b>9025 – M4 J23a Major Interchange Temporary Signals</b></p> |  <p>Yn gweithio ar ran<br/><b>Llywodraeth Cymru</b><br/>Working on behalf of the<br/><b>Welsh Government</b></p> |  |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|

## **APPENDIX E:**

### **Option 3**



South Wales Trunk Road Agent  
Asiant Cefnffyrdd De Cymru

Unit 12A, Llandarcy House  
The Courtyard, D'Arcy Business Park  
Llandarcy, Neath. SA10 6EJ

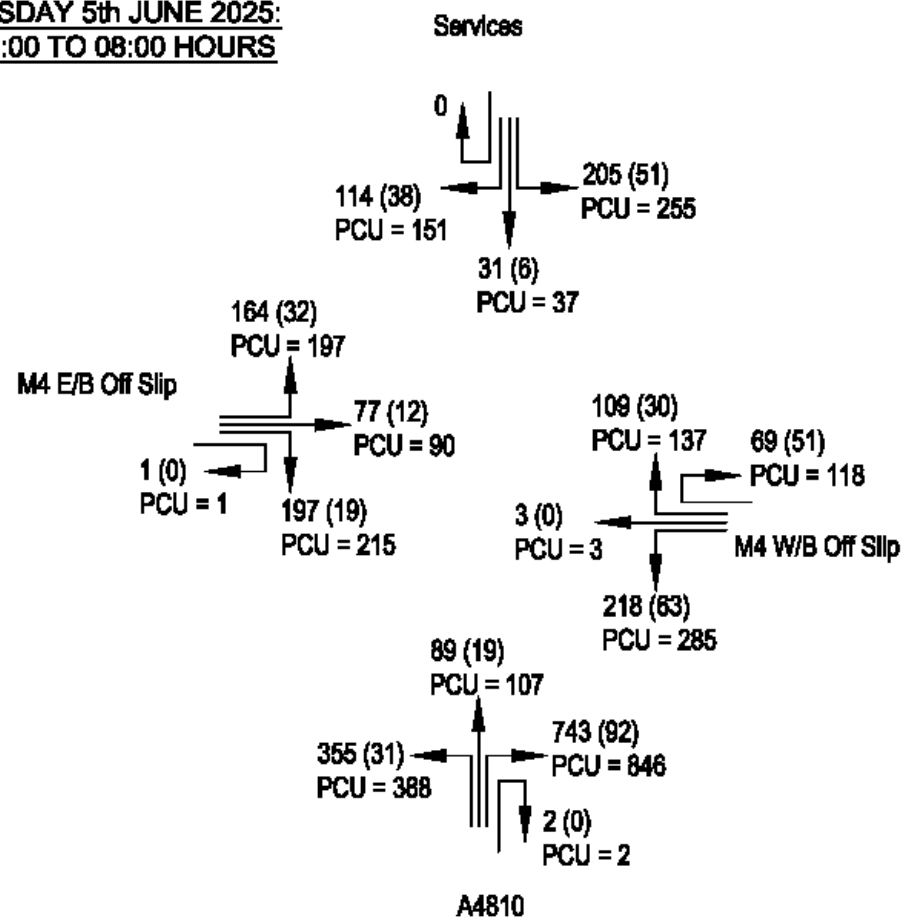
[www.southwales-tra.gov.uk](http://www.southwales-tra.gov.uk)

|                                                                  |                                                                                                                                                                                                                                                                                      |                                                                                                                              |
|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| <p><b>9025 – M4 J23a Major Interchange Temporary Signals</b></p> | <div>  </div> <div> <p>Yn gweithio ar ran<br/><b>Llywodraeth Cymru</b><br/>Working on behalf of the<br/><b>Welsh Government</b></p> </div> | <div>  </div> |
|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|

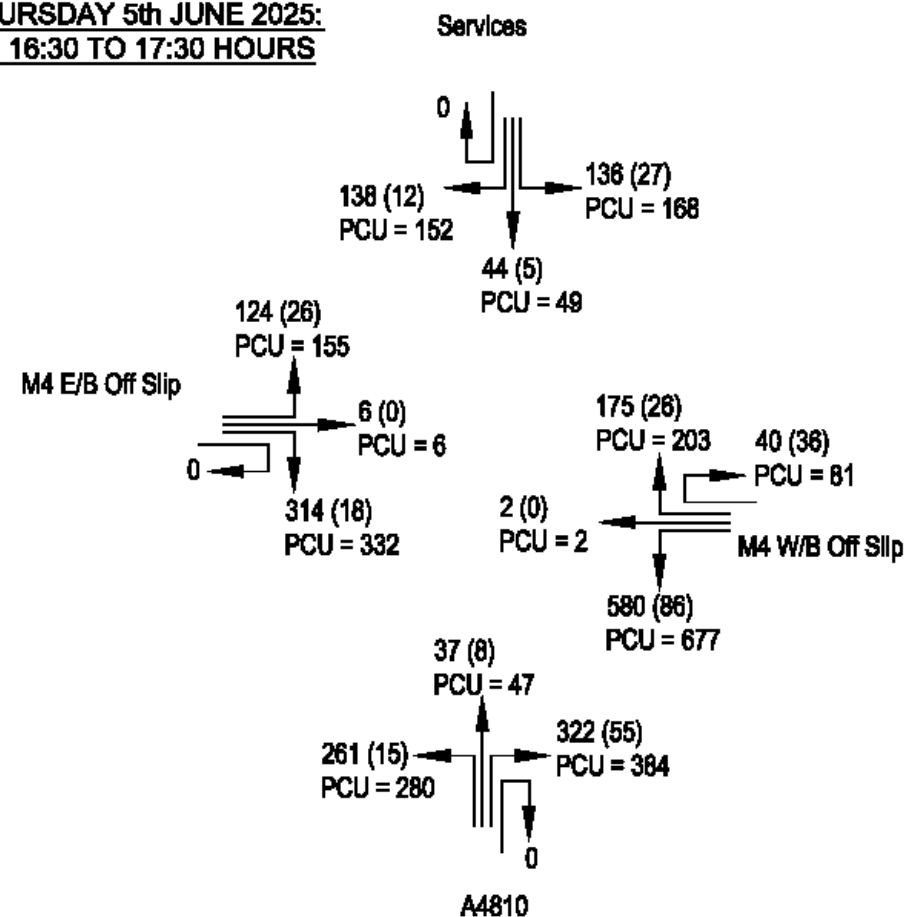
## **APPENDIX A:**

### **AM and PM Peak Hour Traffic Flows**

**THURSDAY 5th JUNE 2025:**  
**AM 07:00 TO 08:00 HOURS**



**THURSDAY 5th JUNE 2025:**  
**PM 16:30 TO 17:30 HOURS**



**KEY**

397 (10) = TOTAL VEHICLES (OF WHICH HGV)

|                                                                  |                                                                                                                                                                                                   |                                                                                     |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <p><b>9025 – M4 J23a Major Interchange Temporary Signals</b></p> |  <p>Yn gweithio ar ran<br/><b>Llywodraeth Cymru</b><br/>Working on behalf of the<br/><b>Welsh Government</b></p> |  |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|

## **APPENDIX B:**

### **Existing Layout**

# Basic Results Summary

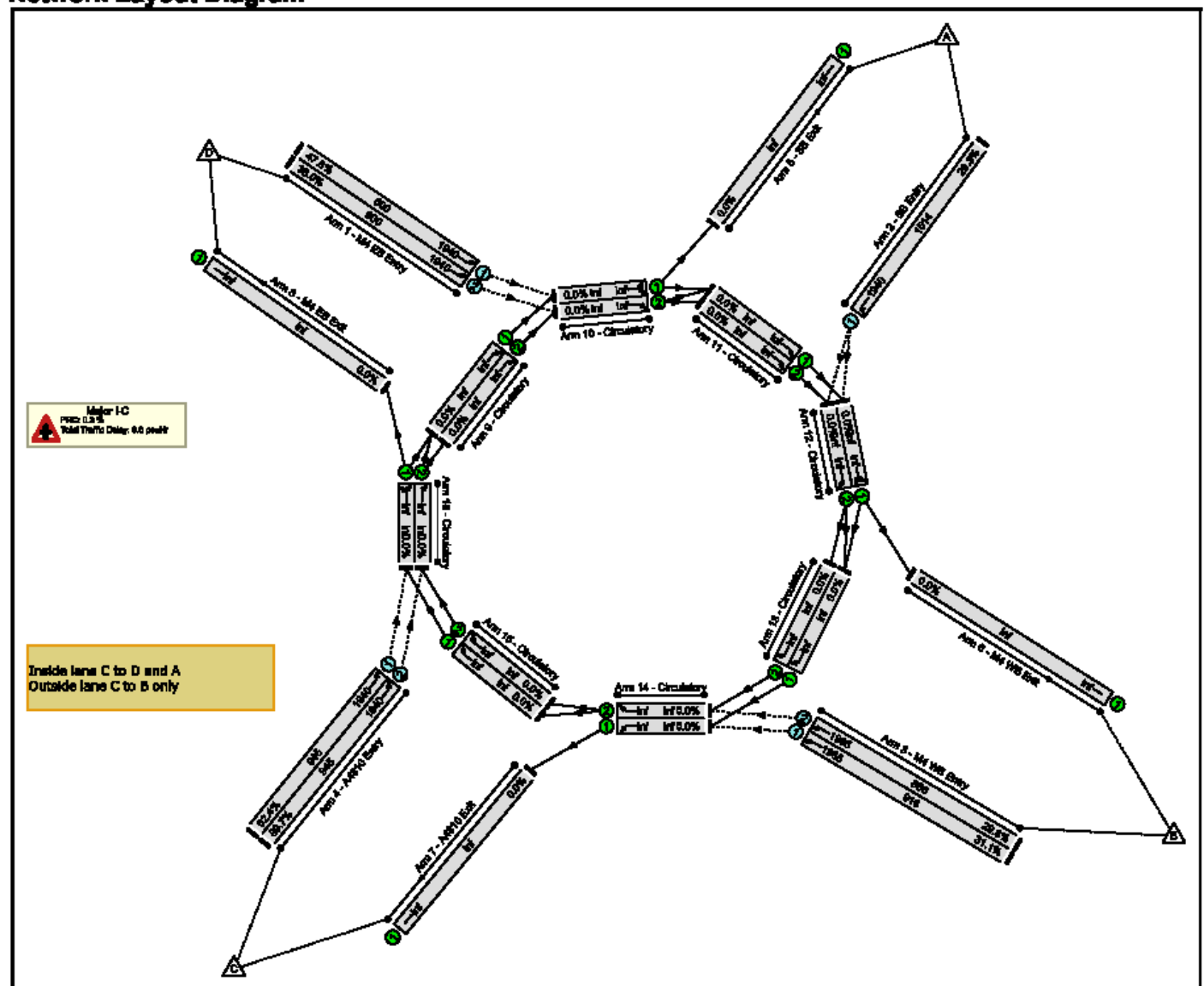
## Basic Results Summary

### User and Project Details

|                    |                                                              |
|--------------------|--------------------------------------------------------------|
| Project:           | SWTRA-9025-25.SW.CSI.005-M4 J23a MAGOR I-C TEMPORARY SIGNALS |
| Title:             |                                                              |
| Location:          | MAGOR I-C                                                    |
| Model Purpose:     | Existing Layout - give way                                   |
| Additional detail: |                                                              |
| File name:         | M4 J23a Existing glve way.lsg3x                              |
| Author:            |                                                              |
| Company:           | WSP                                                          |
| Address:           | Noida                                                        |

### Scenario 7: 'Existing AM' (FG7: 'Thur 5 June 2025 AM', Plan 1: 'Network Control Plan 1')

#### Network Layout Diagram



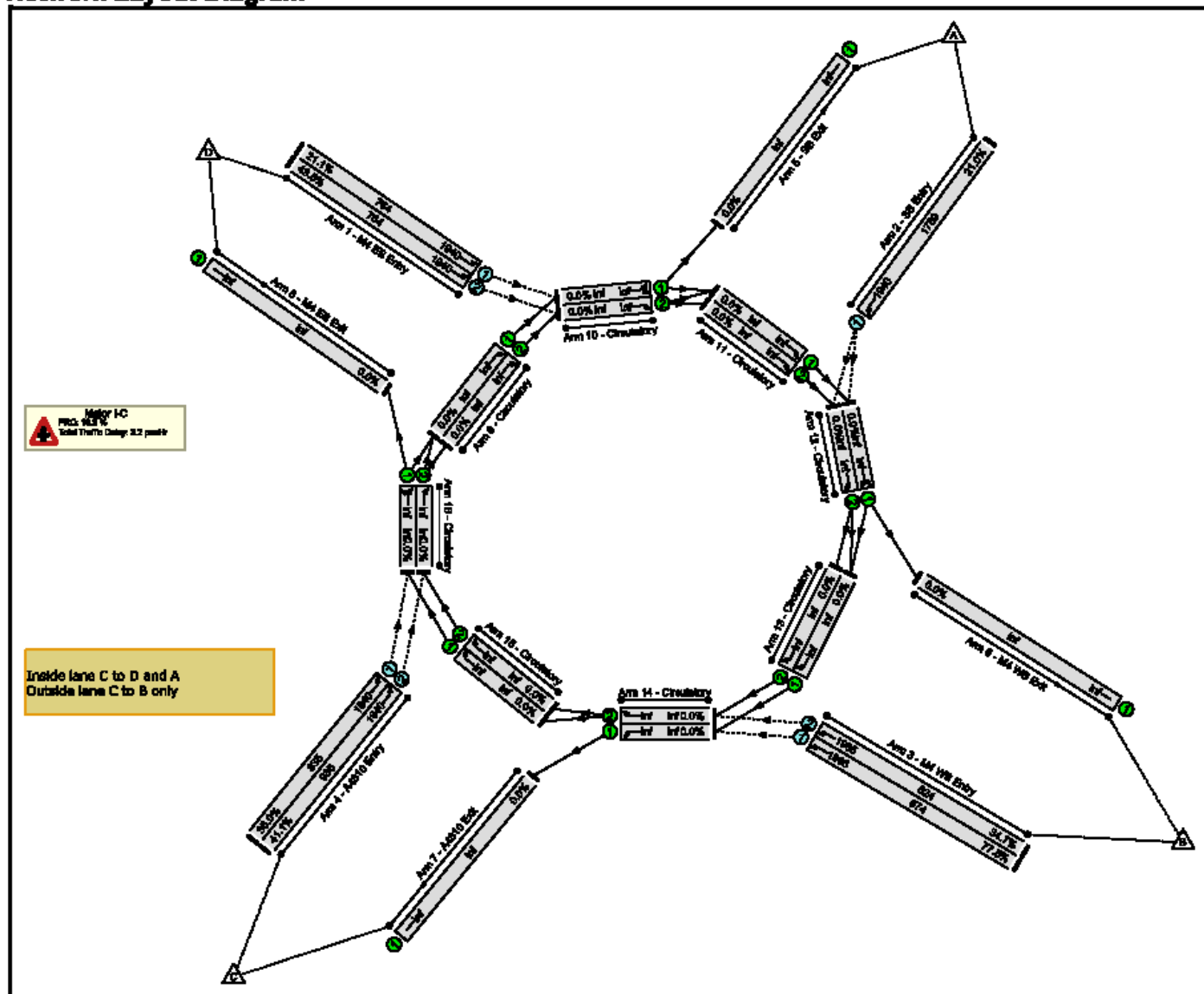
## Network Results

Cycle Time (s): 60

## Basic Results Summary

**Scenario 8: 'Existing PM'** (FG8: 'Thur 5 June 2025 PM', Plan 1: 'Network Control Plan 1')

## Network Layout Diagram



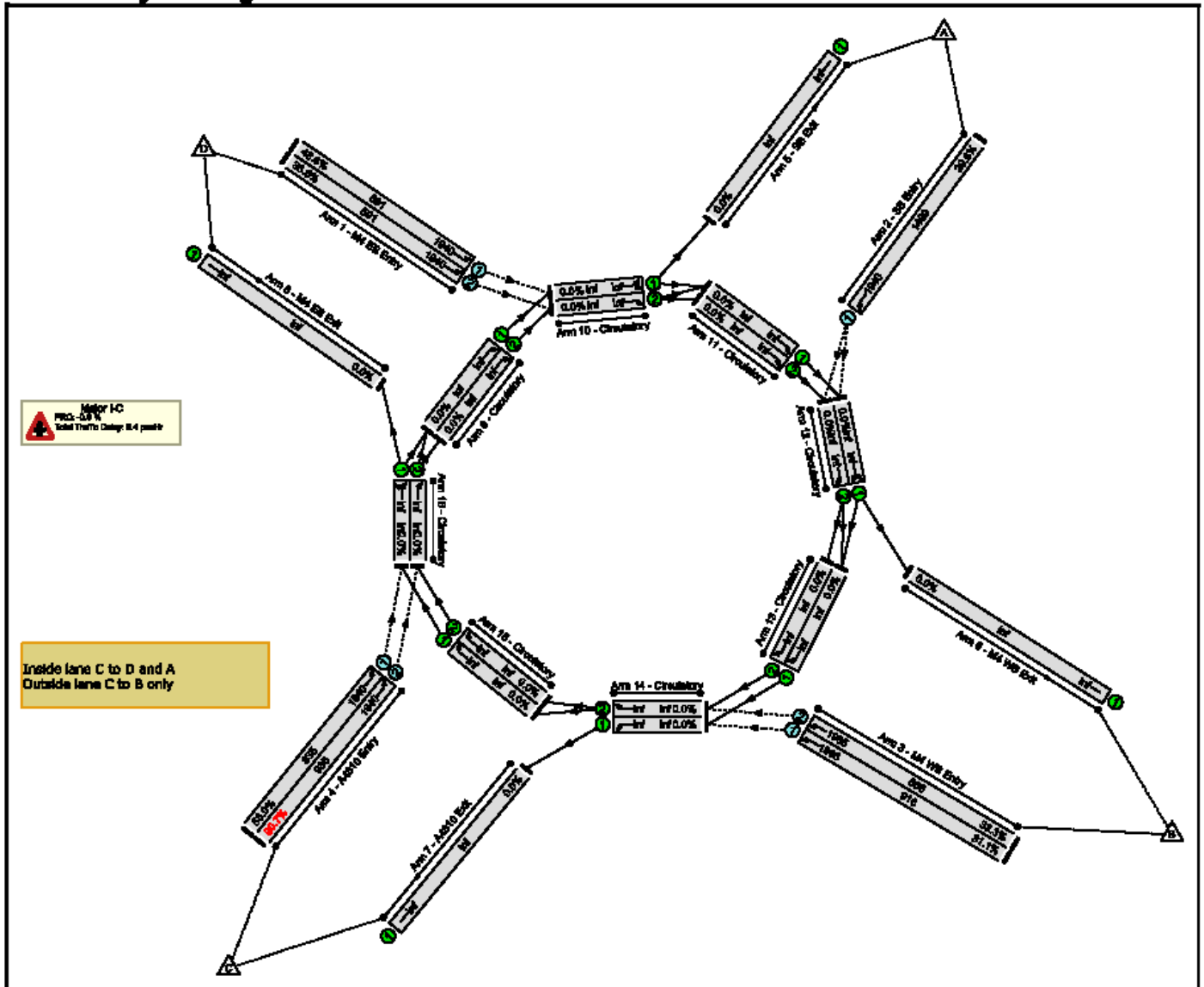
## Network Results

|    |                              |      |                                          |      |                 |    |
|----|------------------------------|------|------------------------------------------|------|-----------------|----|
| C1 | PRC for Signalled Lanes (%): | 0.0  | Total Delay for Signalled Lanes (pcuHr): | 0.00 | Cycle Time (s): | 60 |
|    | PRC Over All Lanes (%):      | 18.2 | Total Delay Over All Lanes (pcuHr):      | 3.22 |                 |    |

## Basic Results Summary

**Scenario 9: 'Existing AM +25% U turners' (FG9: 'Thur 5 June 2025 AM +25%BB', Plan 1: 'Network Control Plan 1')**

## Network Layout Diagram



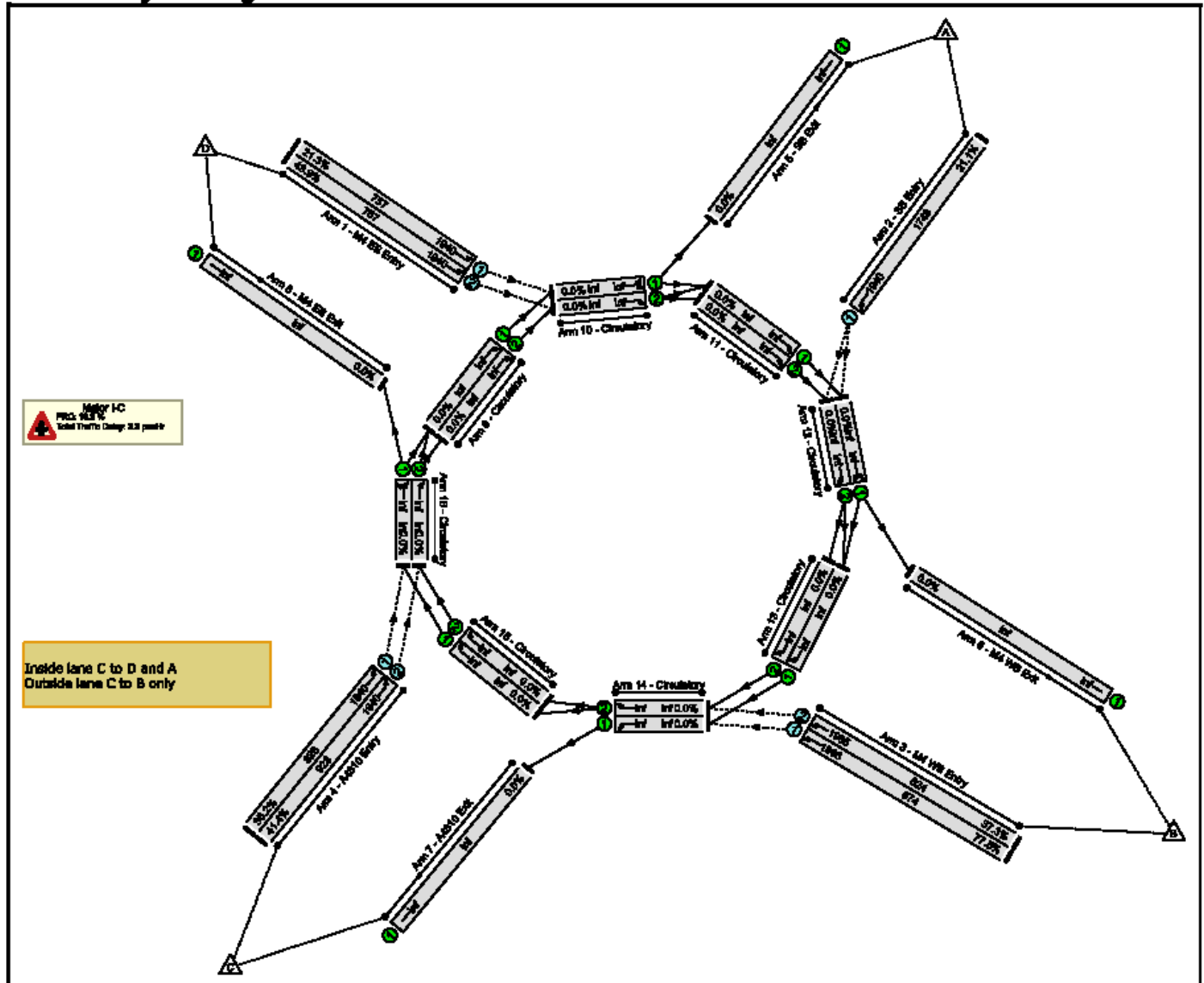
## Network Results

| 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  | -                 | -         | -          |                              | -          | -               | -               | -                 | -                                        | -              | 90.7%       | 2862                  | 0                            | 0                           | 6.4                 | -                         | -                    |
| Major LC | -                 | -         | -          |                              | -          | -               | -               | -                 | -                                        | -              | 90.7%       | 2862                  | 0                            | 0                           | 6.4                 | -                         | -                    |
| 1/1      | M4 EB Entry Ahead | O         | -          |                              | -          | -               | -               | 287               | 1940                                     | 591            | 48.6%       | 287                   | 0                            | 0                           | 0.5                 | 5.9                       | 0.5                  |
| 1/2      | M4 EB Entry Ahead | O         | -          |                              | -          | -               | -               | 216               | 1940                                     | 591            | 36.6%       | 216                   | 0                            | 0                           | 0.3                 | 4.8                       | 0.3                  |
| 2/1      | SB Entry Left     | O         | -          |                              | -          | -               | -               | 443               | 1940                                     | 1499           | 29.6%       | 443                   | 0                            | 0                           | 0.2                 | 1.7                       | 0.2                  |
| 3/1      | M4 WB Entry Ahead | O         | -          |                              | -          | -               | -               | 285               | 1965                                     | 916            | 31.1%       | 285                   | 0                            | 0                           | 0.2                 | 2.9                       | 0.2                  |
| 3/2      | M4 WB Entry Ahead | O         | -          |                              | -          | -               | -               | 288               | 1965                                     | 866            | 33.3%       | 288                   | 0                            | 0                           | 0.2                 | 3.1                       | 0.2                  |
| 4/1      | A4810 Entry Ahead | O         | -          |                              | -          | -               | -               | 495               | 1940                                     | 935            | 53.0%       | 495                   | 0                            | 0                           | 0.6                 | 4.1                       | 0.6                  |
| 4/2      | A4810 Entry Ahead | O         | -          |                              | -          | -               | -               | 648               | 1940                                     | 935            | 90.7%       | 648                   | 0                            | 0                           | 4.4                 | 18.9                      | 4.4                  |
|          |                   |           | C1         | PRC for Signalled Lanes (%): |            |                 |                 | 0.0               | Total Delay for Signalled Lanes (pcuHr): |                |             | 0.00                  | Cycle Time (s): 60           |                             |                     |                           |                      |
|          |                   |           |            | PRC Over All Lanes (%):      |            |                 |                 | -0.8              | Total Delay Over All Lanes(pcuHr):       |                |             | 6.45                  |                              |                             |                     |                           |                      |

## Basic Results Summary

**Scenario 10: 'Existing PM +25% U turners' (FG10: 'Thur 5 June 2025 PM +25%BB', Plan 1: 'Network Control Plan 1')**

## Network Layout Diagram



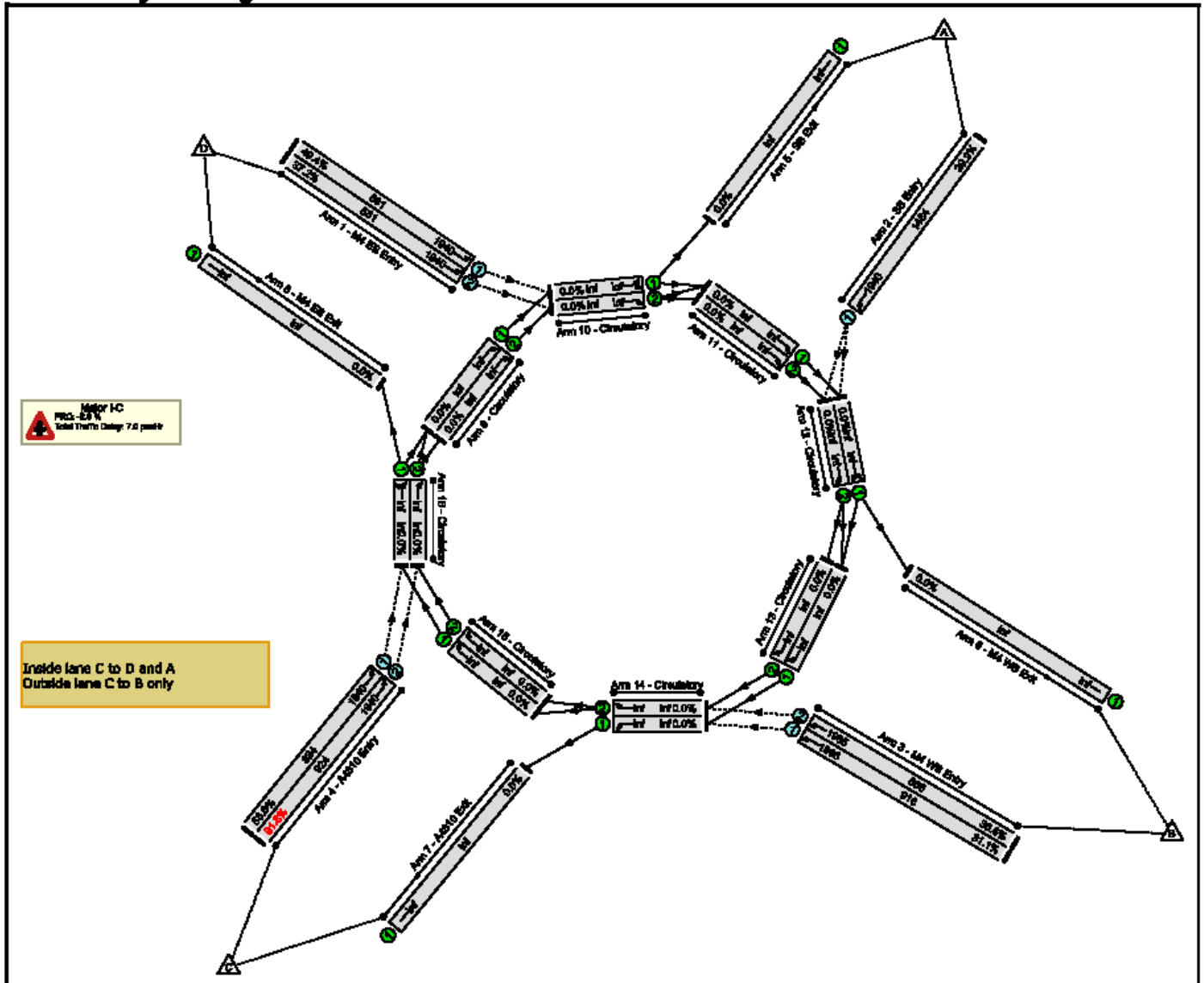
## Network Results

| Item                         | Lane Description  | Lane Type | Full Phase | Arrow Phase | Num Greens | Total Green (s) | Arrow Green (s) | Demand Flow (pcu) | Set 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                      | -                 | -         | -          |             | -          | -               | -               | -                 | -                                        | -              | 77.5%       | 2557                  | 0                            | 0                           | 3.3                 | -                         | -                    |
| Major LC                     | -                 | -         | -          |             | -          | -               | -               | -                 | -                                        | -              | 77.5%       | 2557                  | 0                            | 0                           | 3.3                 | -                         | -                    |
| 1/1                          | M4 EB Entry Ahead | O         | -          |             | -          | -               | -               | 161               | 1940                                     | 757            | 21.3%       | 161                   | 0                            | 0                           | 0.1                 | 3.0                       | 0.1                  |
| 1/2                          | M4 EB Entry Ahead | O         | -          |             | -          | -               | -               | 332               | 1940                                     | 757            | 43.9%       | 332                   | 0                            | 0                           | 0.4                 | 4.2                       | 0.4                  |
| 2/1                          | SB Entry Left     | O         | -          |             | -          | -               | -               | 369               | 1940                                     | 1748           | 21.1%       | 369                   | 0                            | 0                           | 0.1                 | 1.3                       | 0.1                  |
| 3/1                          | M4 WB Entry Ahead | O         | -          |             | -          | -               | -               | 677               | 1965                                     | 874            | 77.5%       | 677                   | 0                            | 0                           | 1.7                 | 9.0                       | 1.7                  |
| 3/2                          | M4 WB Entry Ahead | O         | -          |             | -          | -               | -               | 307               | 1965                                     | 824            | 37.3%       | 307                   | 0                            | 0                           | 0.3                 | 3.5                       | 0.3                  |
| 4/1                          | A4810 Entry Ahead | O         | -          |             | -          | -               | -               | 327               | 1940                                     | 928            | 35.2%       | 327                   | 0                            | 0                           | 0.3                 | 3.0                       | 0.3                  |
| 4/2                          | A4810 Entry Ahead | O         | -          |             | -          | -               | -               | 384               | 1940                                     | 928            | 41.4%       | 384                   | 0                            | 0                           | 0.4                 | 3.3                       | 0.4                  |
| C1                           |                   |           |            |             |            |                 |                 | 0.0               | Total Delay for Signalled Lanes (pcuHr): |                |             | 0.00                  | Cycle Time (s): 60           |                             |                     |                           |                      |
| PRC for Signalled Lanes (%): |                   |           |            |             |            |                 |                 | 18.2              | Total Delay Over All Lanes(pcuHr):       |                |             | 3.27                  |                              |                             |                     |                           |                      |
| PRC Over All Lanes (%):      |                   |           |            |             |            |                 |                 |                   |                                          |                |             |                       |                              |                             |                     |                           |                      |

## Basic Results Summary

**Scenario 11: 'Existing AM +50% U turners' (FG11: 'Thur 5 June 2025 AM +50%BB', Plan 1: 'Network Control Plan 1')**

## Network Layout Diagram



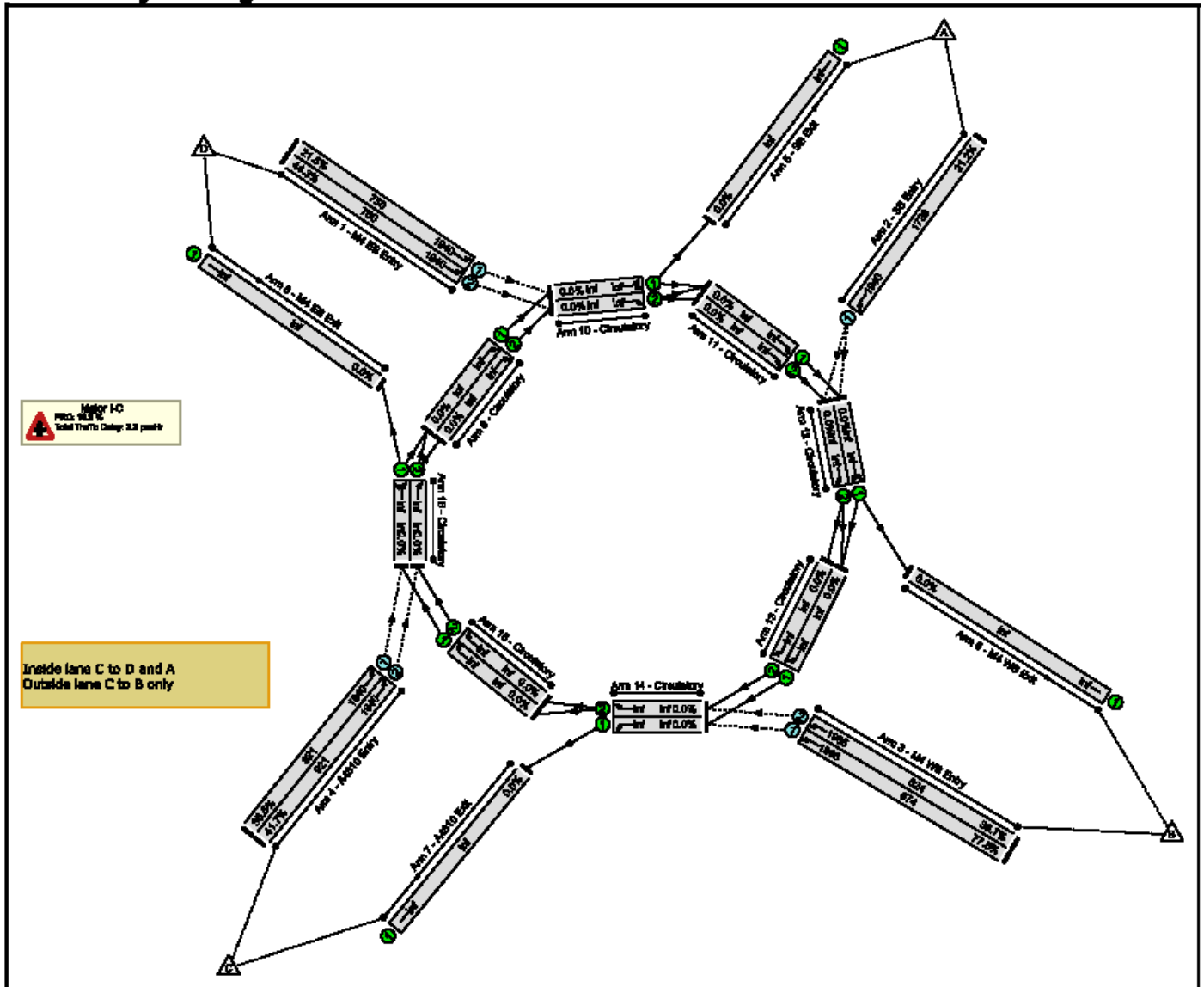
## Network Results

| 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  | -                 | -         | -          |                                                         | -          | -               | -               | -                 | -                                                                              | -              | 91.8%       | 2891                  | 0                            | 0                           | 7.0                 | -                         | -                    |
| Major LC | -                 | -         | -          |                                                         | -          | -               | -               | -                 | -                                                                              | -              | 91.8%       | 2891                  | 0                            | 0                           | 7.0                 | -                         | -                    |
| 1/1      | M4 EB Entry Ahead | O         | -          |                                                         | -          | -               | -               | 287               | 1940                                                                           | 581            | 49.4%       | 287                   | 0                            | 0                           | 0.5                 | 6.1                       | 0.5                  |
| 1/2      | M4 EB Entry Ahead | O         | -          |                                                         | -          | -               | -               | 216               | 1940                                                                           | 581            | 37.2%       | 216                   | 0                            | 0                           | 0.3                 | 4.9                       | 0.3                  |
| 2/1      | SB Entry Left     | O         | -          |                                                         | -          | -               | -               | 443               | 1940                                                                           | 1484           | 29.9%       | 443                   | 0                            | 0                           | 0.2                 | 1.7                       | 0.2                  |
| 3/1      | M4 WB Entry Ahead | O         | -          |                                                         | -          | -               | -               | 285               | 1965                                                                           | 916            | 31.1%       | 285                   | 0                            | 0                           | 0.2                 | 2.8                       | 0.2                  |
| 3/2      | M4 WB Entry Ahead | O         | -          |                                                         | -          | -               | -               | 317               | 1965                                                                           | 866            | 36.6%       | 317                   | 0                            | 0                           | 0.3                 | 3.3                       | 0.3                  |
| 4/1      | A4810 Entry Ahead | O         | -          |                                                         | -          | -               | -               | 495               | 1940                                                                           | 924            | 53.6%       | 495                   | 0                            | 0                           | 0.6                 | 4.2                       | 0.6                  |
| 4/2      | A4810 Entry Ahead | O         | -          |                                                         | -          | -               | -               | 648               | 1940                                                                           | 924            | 91.8%       | 648                   | 0                            | 0                           | 4.9                 | 20.9                      | 4.9                  |
| C1       |                   |           |            | PRC for Signalled Lanes (%):<br>PRC Over All Lanes (%): |            |                 |                 | 0.0<br>-2.0       | Total Delay for Signalled Lanes (pcuHr):<br>Total Delay Over All Lanes(pcuHr): |                |             |                       | 0.00<br>7.02                 | Cycle Time (s):    60       |                     |                           |                      |

## Basic Results Summary

**Scenario 12: 'Eisting PM +50% U turners' (FG12: 'Thur 5 June 2025 PM +50%BB', Plan 1: 'Network Control Plan 1')**

## Network Layout Diagram



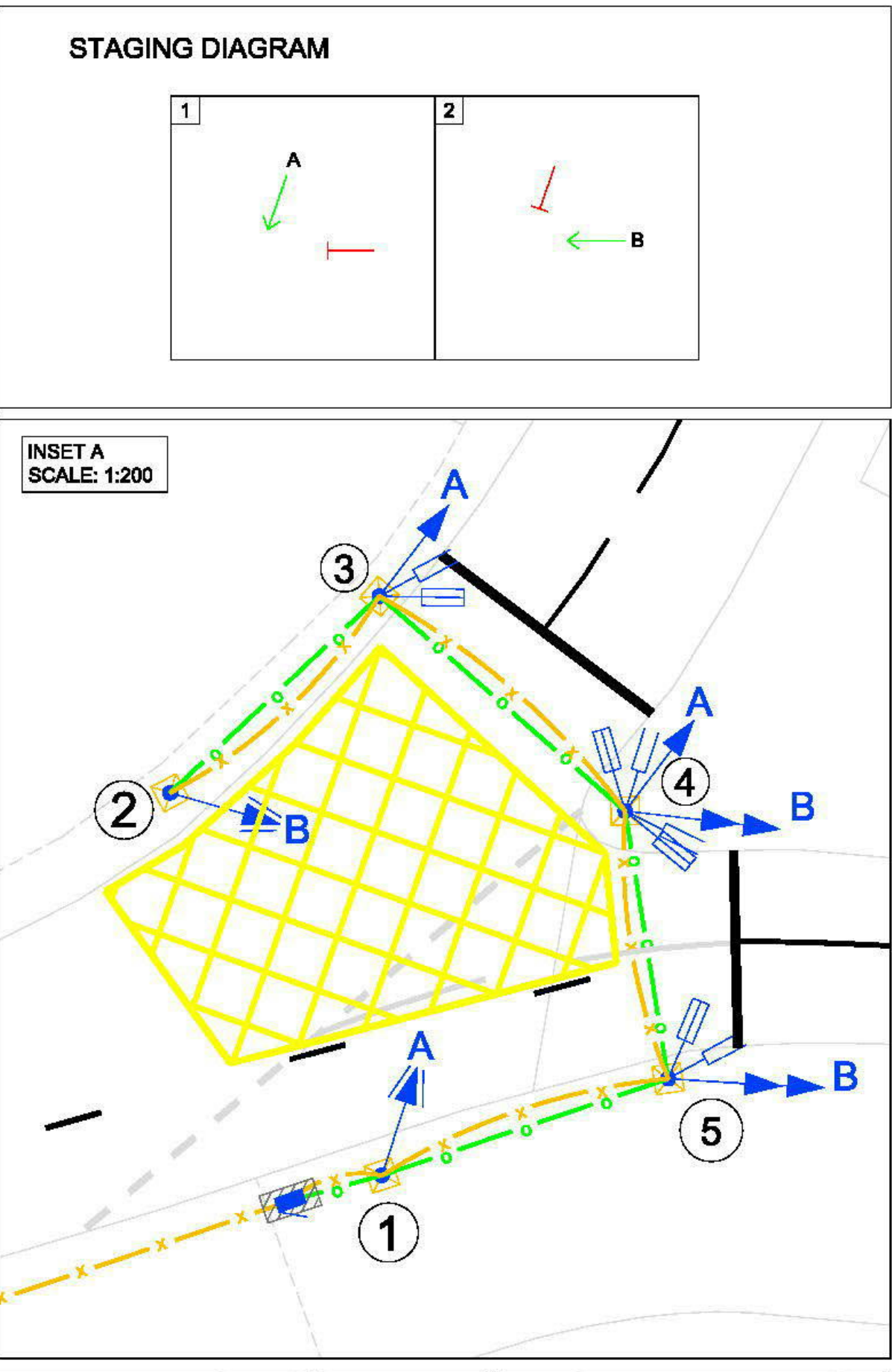
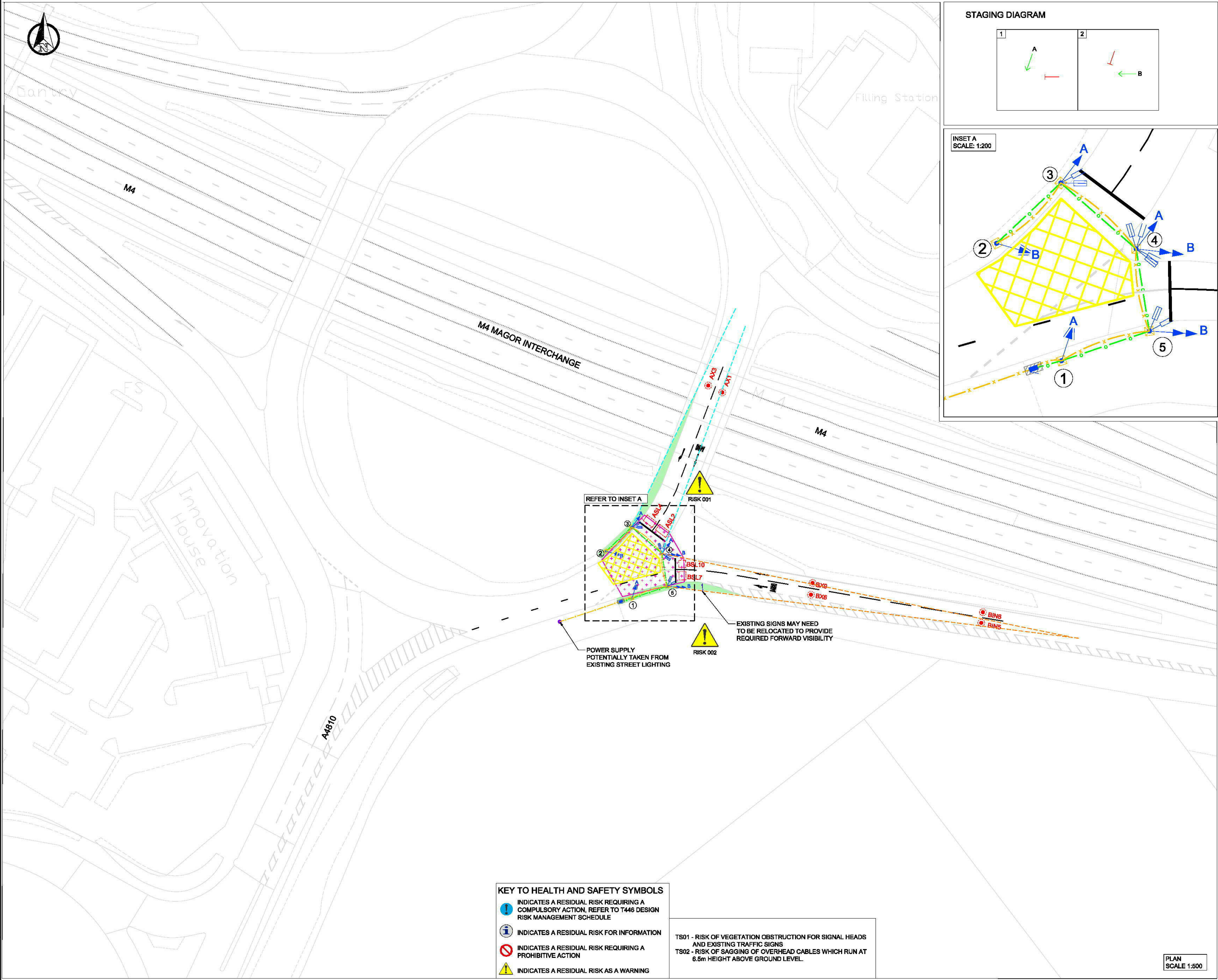
## Network Results

Cycle Time (s): 60

|                                                                  |                                                                                                                                                                                                                                                                                      |                                                                                                                              |
|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| <p><b>9025 – M4 J23a Major Interchange Temporary Signals</b></p> | <div>  </div> <div> <p>Yn gweithio ar ran<br/><b>Llywodraeth Cymru</b><br/>Working on behalf of the<br/><b>Welsh Government</b></p> </div> | <div>  </div> |
|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|

## **APPENDIX C:**

### **Option 1**



**NOTES**

- DO NOT SCALE FROM THIS DRAWING.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS AND DOCUMENTS IN THE DESIGN PACKAGE.
- LAYOUT BASED ON URBAN 64 TEMPORARY TRAFFIC SIGNALS.
- ALL CABLES TO BE OVERHEAD AND MINIMUM 6.5 METRES ABOVE GROUND LEVEL.
- POWER SUPPLY TO BE TAKEN FROM STREET LIGHTING APPARATUS (EITHER COLUMN OR FEEDER PILLAR TO BE DETERMINED).
- TEMPORARY BARRIERS TO BE PROVIDED AROUND SIGNAL POLES TO PROTECT EQUIPMENT AND ROAD USERS.
- SPEED LIMIT TO BE REDUCED TO 40MPH ON APPROACHES TO TEMPORARY TRAFFIC SIGNALS.
- POSITION OF POLES, CONTROLLERS AND TRAFFIC SIGNS AND ROAD MARKINGS ARE BASED ON THE OS MAP DUE TO THE UNAVAILABILITY OF TOPO SURVEY.

**KEY:**

- REQUIRED FORWARD VISIBILITY AS PER DMRB FOR 40mph
- REQUIRED JUNCTION INTERVISIBILITY ZONE AS PER TSM CH6
- FORWARD VISIBILITY IN CIRCULARITY AS PER DMRB CD116 (70m)
- VEGETATION TO BE CLEARED TO PROVIDE REQUIRED VISIBILITY
- TRAFFIC SIGNAL CONTROLLER
- CONCRETE BLOCK 1000mm X 1000mm FOR TRAFFIC SIGNAL POLES AND CONTROLLER
- 6.5m HIGH TRAFFIC SIGNAL POLE
- RAG PRIMARY SIGNAL HEAD
- RAG PRIMARY SIGNAL HEAD HIGH LEVEL REPEATER
- RAG SECONDARY SIGNAL HEAD
- ABOVE GROUND MOVA VEHICLE DETECTOR
- STOP LINE DETECTORS
- ELECTRIC CABLE FOR SIGNALS 6.5m ABOVE THE GROUND LEVEL
- DATA CABLE 6.5M ABOVE THE GROUND LEVEL
- VIRTUAL MOVA DETECTION ZONES
- VIRTUAL STOP LINE DETECTION ZONES
- PROPOSED ROAD MARKINGS
- PROPOSED YELLOW BOX
- PROPOSED HARD STANDING AREA

|     |                                 |    |    |     |            |
|-----|---------------------------------|----|----|-----|------------|
| P02 | CLIENT COMMENT YELLOW BOX ADDED | GV | ML | SJB | 19/09/2025 |
| P01 | FIRST ISSUE                     | GV | ML | SJB | 10/09/2025 |
| Rev | Details                         | Dr | Ch | Ap  | Date       |

Llywodraeth Cymru  
Welsh Government

**South Wales Trunk Road Agent**  
**Asiant Cefnfyrdde De Cymru**

**Head of Trunk Road Agent**  
Y Ceiau / The Quays, Brunel Way,  
Briton Ferry, Neath, SA11 2GG

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wsp.com

Project

M4 J23A MAGOR INTERCHANGE  
TEMPORARY SIGNALS  
OPTION 1  
SIGNALISE M4 WESTBOUND OFF SLIP ROAD

|             |                    |              |            |          |            |
|-------------|--------------------|--------------|------------|----------|------------|
| File No.    | Financial Code No. | 25/SW/CSW005 |            |          |            |
| Drawn       | GV                 | Created      | ML         | Approved | SJB        |
| Date        | 10/09/2025         | Date         | 15/09/2025 | Date     | 15/09/2025 |
| Scales      | AS SHOWN           |              |            |          |            |
| Drawing No. | UK0029359.3987-001 |              |            |          |            |
| P02         |                    |              |            |          |            |

**KEY TO HEALTH AND SAFETY SYMBOLS**

- INDICATES A RESIDUAL RISK REQUIRING A COMPULSORY ACTION, REFER TO T446 DESIGN RISK MANAGEMENT SCHEDULE
- INDICATES A RESIDUAL RISK FOR INFORMATION
- INDICATES A RESIDUAL RISK REQUIRING A PROHIBITIVE ACTION
- INDICATES A RESIDUAL RISK AS A WARNING

TS01 - RISK OF VEGETATION OBSTRUCTION FOR SIGNAL HEADS AND EXISTING TRAFFIC SIGNS

TS02 - RISK OF SAGGING OF OVERHEAD CABLES WHICH RUN AT 6.5m HEIGHT ABOVE GROUND LEVEL.

PLAN  
SCALE 1:500

# Basic Results Summary

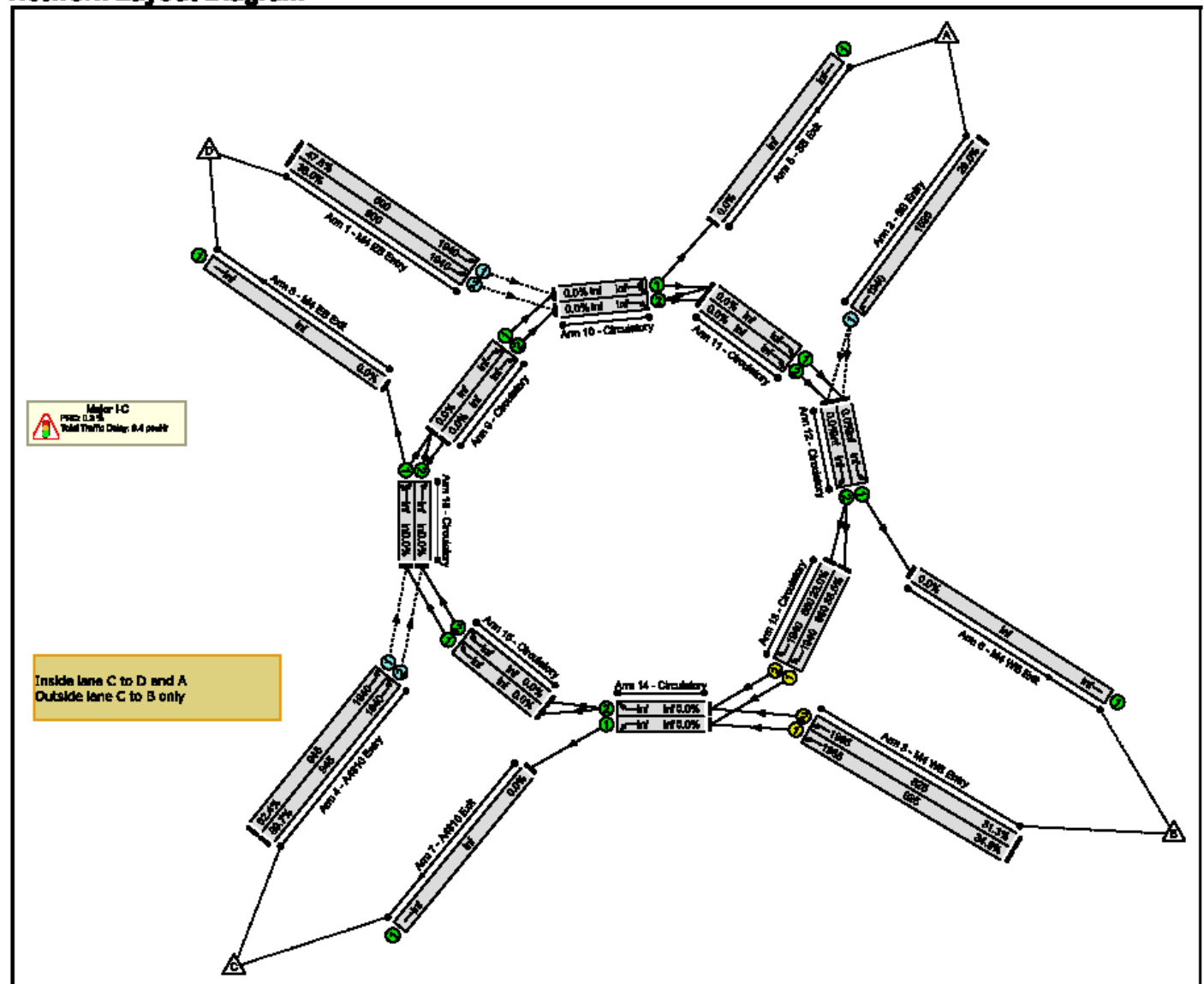
## Basic Results Summary

### User and Project Details

|                    |                                                              |
|--------------------|--------------------------------------------------------------|
| Project:           | SWTRA-9025-25.SW.CSI.005-M4 J23a MAGOR I-C TEMPORARY SIGNALS |
| Title:             |                                                              |
| Location:          | MAGOR I-C                                                    |
| Model Purpose:     | Option 1 Signals on M4 Westbound Off Slip Road               |
| Additional detail: |                                                              |
| File name:         | M4 J23a Option 1.lsg3x                                       |
| Author:            |                                                              |
| Company:           | WSP                                                          |
| Address:           | Noida                                                        |

### Scenario 7: 'Existing AM' (FG7: 'Thur 5 June 2025 AM', Plan 1: 'Network Control Plan 1')

#### Network Layout Diagram

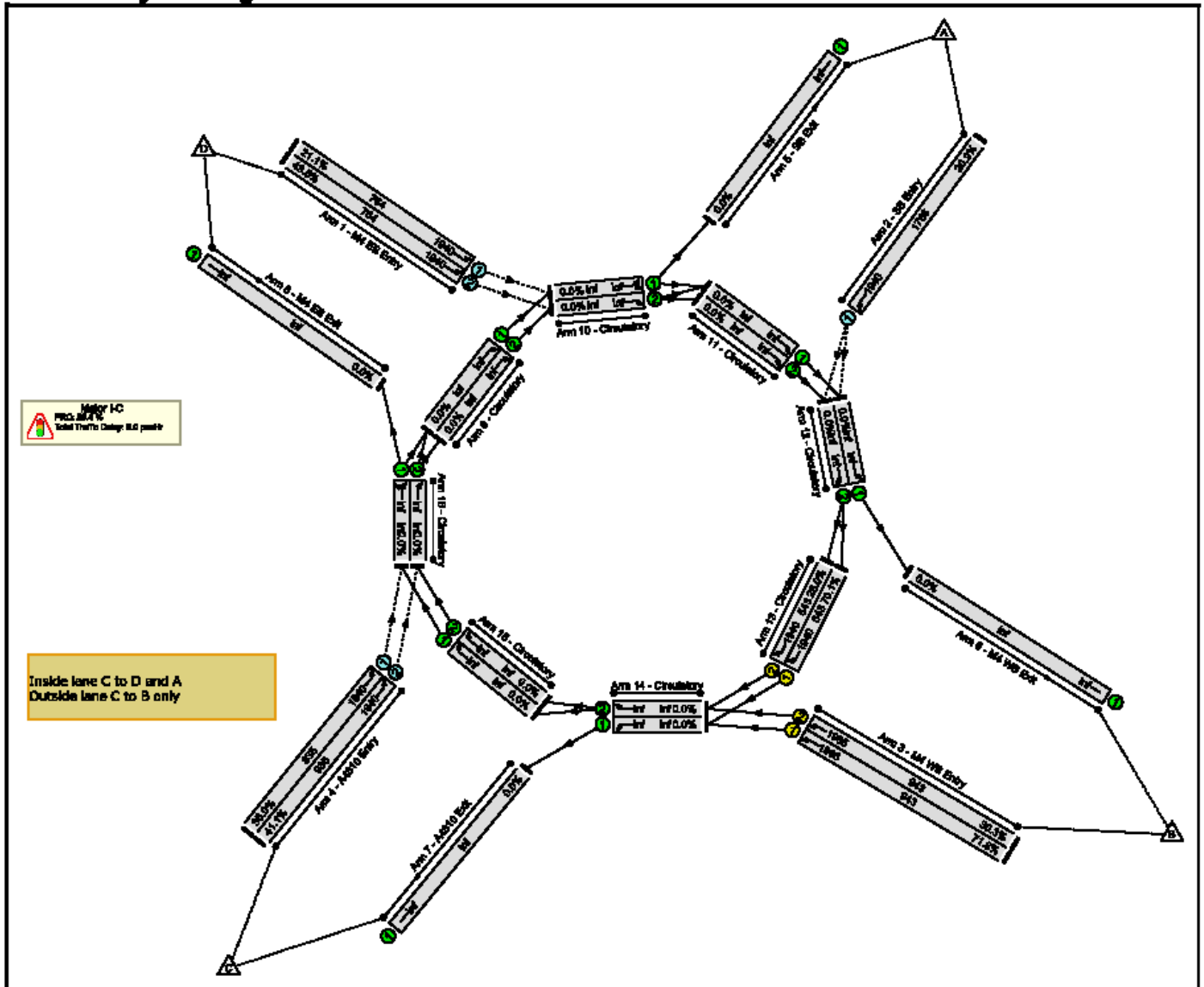


## Network Results

## Basic Results Summary

**Scenario 8: 'Existing PM'** (FG8: 'Thur 5 June 2025 PM', Plan 1: 'Network Control Plan 1')

## Network Layout Diagram



# Basic Results Summary

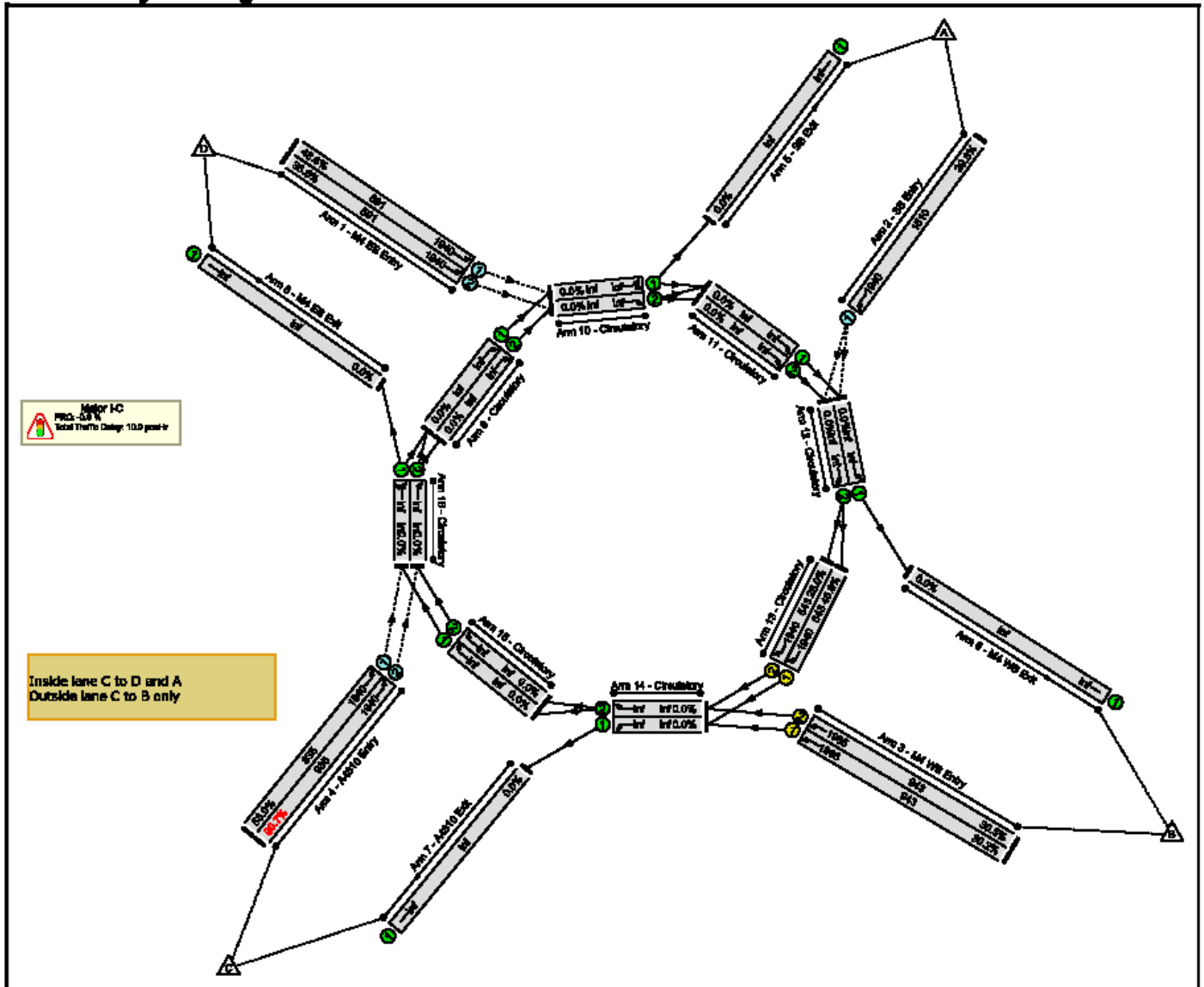
## Network Results

| 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  | -                 | -         | -          |             | -          | -               | -               | -                                                       | -                 | -                                                                              | 71.8%       | 1573                  | 0                            | 0                           | 9.0                 | -                         | -                    |
| Major LC | -                 | -         | -          |             | -          | -               | -               | -                                                       | -                 | -                                                                              | 71.8%       | 1573                  | 0                            | 0                           | 9.0                 | -                         | -                    |
| 1/1      | M4 EB Entry Ahead | O         | -          |             | -          | -               | -               | 161                                                     | 1940              | 764                                                                            | 21.1%       | 161                   | 0                            | 0                           | 0.1                 | 3.0                       | 0.1                  |
| 1/2      | M4 EB Entry Ahead | O         | -          |             | -          | -               | -               | 332                                                     | 1940              | 764                                                                            | 43.5%       | 332                   | 0                            | 0                           | 0.4                 | 4.2                       | 0.4                  |
| 2/1      | SB Entry Left     | O         | -          |             | -          | -               | -               | 369                                                     | 1940              | 1766                                                                           | 20.9%       | 369                   | 0                            | 0                           | 0.1                 | 1.3                       | 0.1                  |
| 3/1      | M4 WB Entry Ahead | U         | B          |             | 1          | 23              | -               | 677                                                     | 1965              | 943                                                                            | 71.8%       | -                     | -                            | -                           | 3.2                 | 17.0                      | 8.6                  |
| 3/2      | M4 WB Entry Ahead | U         | B          |             | 1          | 23              | -               | 266                                                     | 1965              | 943                                                                            | 30.3%       | -                     | -                            | -                           | 0.8                 | 10.7                      | 2.6                  |
| 4/1      | A4810 Entry Ahead | O         | -          |             | -          | -               | -               | 327                                                     | 1940              | 935                                                                            | 35.0%       | 327                   | 0                            | 0                           | 0.3                 | 3.0                       | 0.3                  |
| 4/2      | A4810 Entry Ahead | O         | -          |             | -          | -               | -               | 384                                                     | 1940              | 935                                                                            | 41.1%       | 384                   | 0                            | 0                           | 0.3                 | 3.3                       | 0.3                  |
| 13/1     | Circulatory Right | U         | A          |             | 1          | 13              | -               | 381                                                     | 1940              | 543                                                                            | 70.1%       | -                     | -                            | -                           | 2.9                 | 27.1                      | 5.8                  |
| 13/2     | Circulatory Right | U         | A          |             | 1          | 13              | -               | 152                                                     | 1940              | 543                                                                            | 28.0%       | -                     | -                            | -                           | 0.8                 | 18.7                      | 1.8                  |
| C1       |                   |           |            |             |            |                 |                 | PRC for Signalled Lanes (%):<br>PRC Over All Lanes (%): | 25.4<br>25.4      | Total Delay for Signalled Lanes (pcuHr):<br>Total Delay Over All Lanes(pcuHr): |             |                       | 7.70<br>8.97                 | Cycle Time (s): 50          |                     |                           |                      |

## Basic Results Summary

**Scenario 9: 'Existing AM +25% U turners' (FG9: 'Thur 5 June 2025 AM +25%BB', Plan 1: 'Network Control Plan 1')**

## Network Layout Diagram



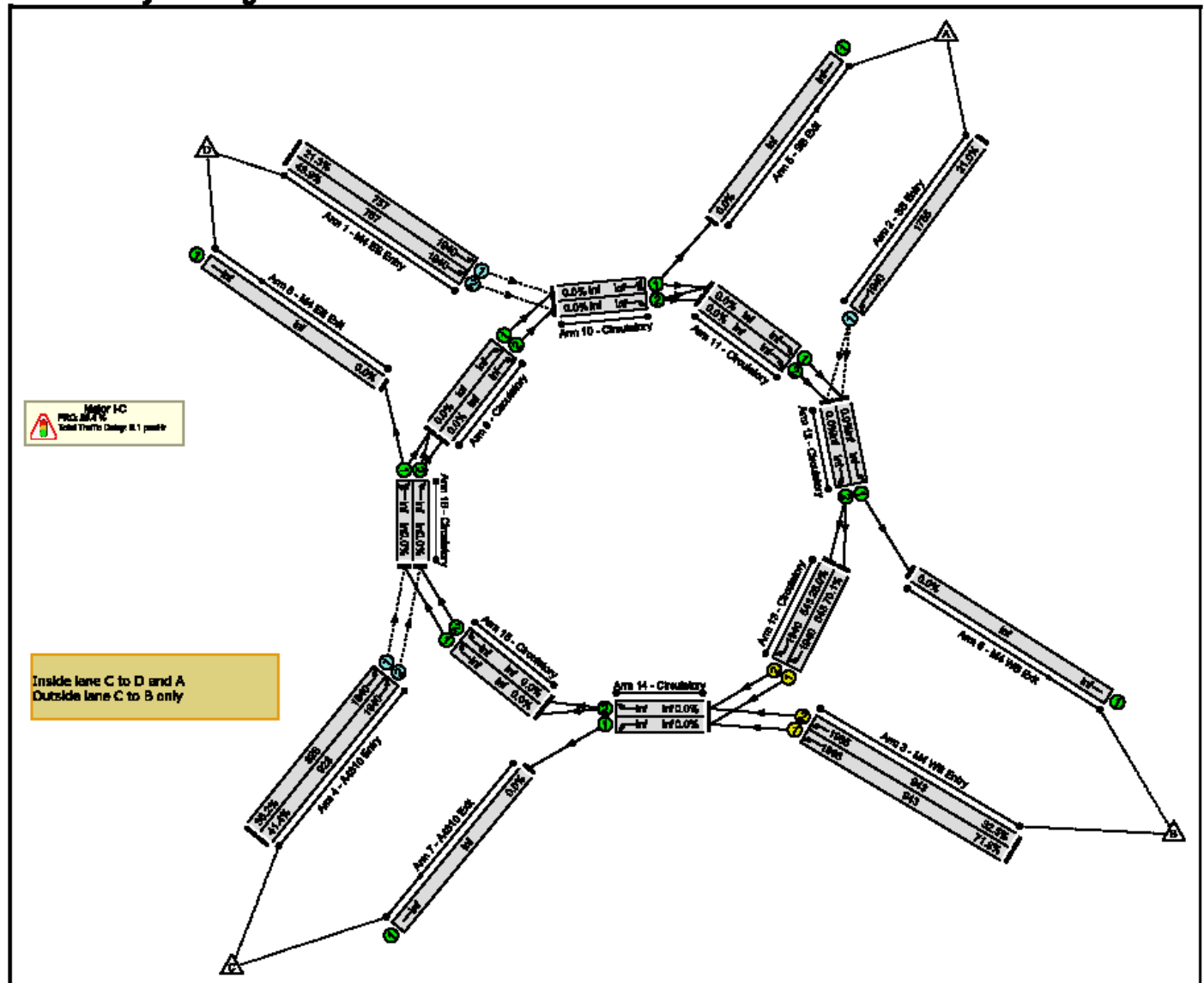
# Basic Results Summary

## 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  | -                 | -         | -          |             | -          | -               | -               | -                            | -                 | -                                        | 90.7%       | 2289                  | 0                            | 0                           | 10.0                | -                         | -                    |
| Major LC | -                 | -         | -          |             | -          | -               | -               | -                            | -                 | -                                        | 90.7%       | 2289                  | 0                            | 0                           | 10.0                | -                         | -                    |
| 1/1      | M4 EB Entry Ahead | O         | -          |             | -          | -               | -               | 287                          | 1940              | 591                                      | 48.6%       | 287                   | 0                            | 0                           | 0.5                 | 5.9                       | 0.5                  |
| 1/2      | M4 EB Entry Ahead | O         | -          |             | -          | -               | -               | 216                          | 1940              | 591                                      | 38.6%       | 216                   | 0                            | 0                           | 0.3                 | 4.8                       | 0.3                  |
| 2/1      | SB Entry Left     | O         | -          |             | -          | -               | -               | 443                          | 1940              | 1510                                     | 29.3%       | 443                   | 0                            | 0                           | 0.2                 | 1.7                       | 0.2                  |
| 3/1      | M4 WB Entry Ahead | U         | B          |             | 1          | 23              | -               | 285                          | 1965              | 943                                      | 30.2%       | -                     | -                            | -                           | 0.8                 | 10.7                      | 2.6                  |
| 3/2      | M4 WB Entry Ahead | U         | B          |             | 1          | 23              | -               | 288                          | 1965              | 943                                      | 30.5%       | -                     | -                            | -                           | 0.9                 | 10.7                      | 2.6                  |
| 4/1      | A4810 Entry Ahead | O         | -          |             | -          | -               | -               | 495                          | 1940              | 935                                      | 53.0%       | 495                   | 0                            | 0                           | 0.6                 | 4.1                       | 0.6                  |
| 4/2      | A4810 Entry Ahead | O         | -          |             | -          | -               | -               | 848                          | 1940              | 935                                      | 90.7%       | 848                   | 0                            | 0                           | 4.5                 | 19.1                      | 8.2                  |
| 13/1     | Circulatory Right | U         | A          |             | 1          | 13              | -               | 254                          | 1940              | 543                                      | 46.8%       | -                     | -                            | -                           | 1.5                 | 21.1                      | 3.3                  |
| 13/2     | Circulatory Right | U         | A          |             | 1          | 13              | -               | 152                          | 1940              | 543                                      | 28.0%       | -                     | -                            | -                           | 0.8                 | 18.7                      | 1.8                  |
| C1       |                   |           |            |             |            |                 |                 | PRC for Signalled Lanes (%): | 92.5              | Total Delay for Signalled Lanes (pcuHr): |             |                       | 3.98                         | Cycle Time (s): 50          |                     |                           |                      |
|          |                   |           |            |             |            |                 |                 | PRC Over All Lanes (%):      | -0.8              | Total Delay Over All Lanes(pcuHr):       |             |                       | 10.01                        |                             |                     |                           |                      |

**Scenario 10: 'Existing PM +25% U turners' (FG10: 'Thur 5 June 2025 PM +25%BB', Plan 1: 'Network Control Plan 1')**

### Network Layout Diagram



# Basic Results Summary

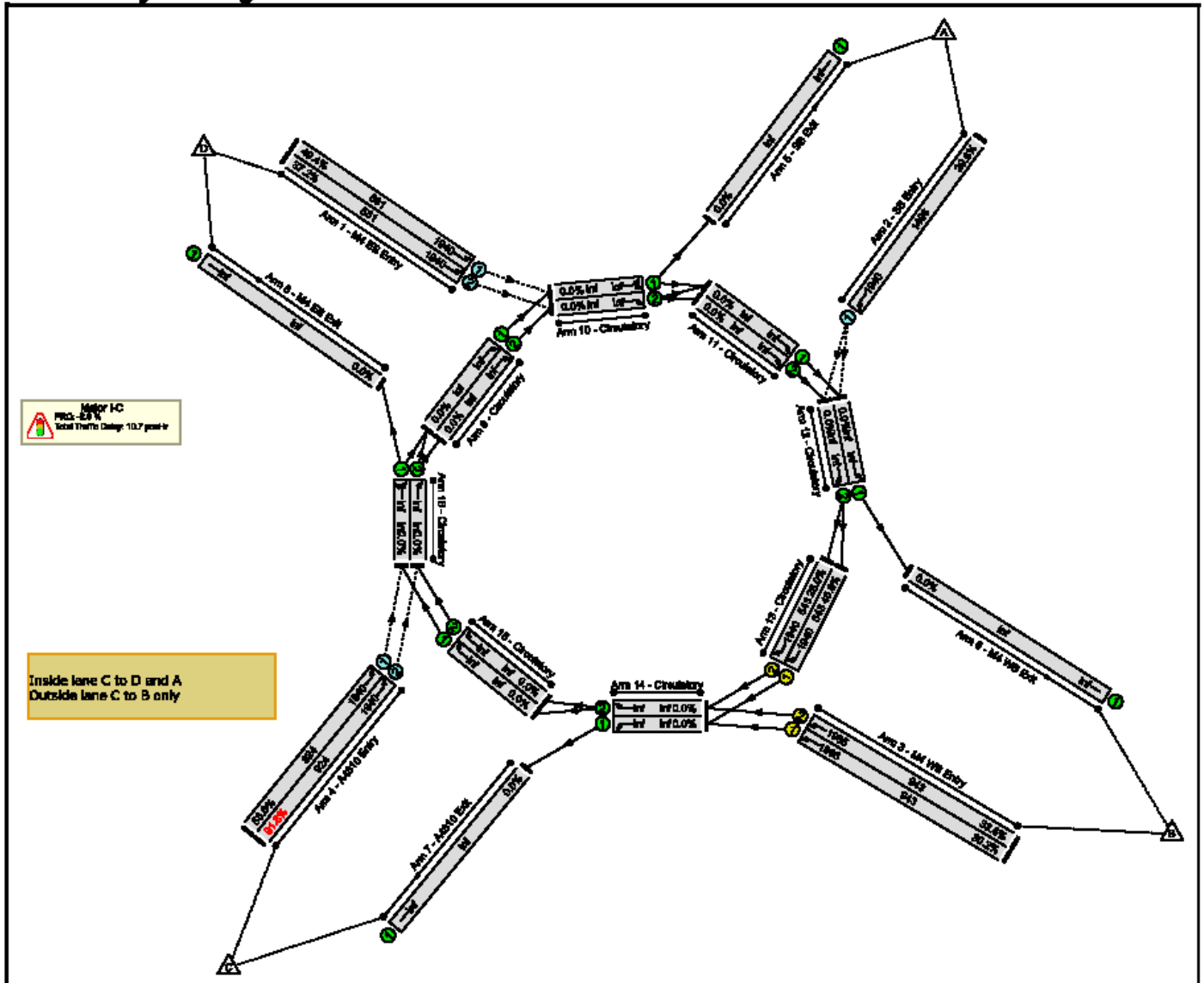
## Network Results

| 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  | -                 | -         | -          |             | -          | -               | -               | -                                                       | -                 | -                                                                              | 71.8%       | 1573                  | 0                            | 0                           | 9.1                 | -                         | -                    |
| Major LC | -                 | -         | -          |             | -          | -               | -               | -                                                       | -                 | -                                                                              | 71.8%       | 1573                  | 0                            | 0                           | 9.1                 | -                         | -                    |
| 1/1      | M4 EB Entry Ahead | O         | -          |             | -          | -               | -               | 161                                                     | 1940              | 757                                                                            | 21.3%       | 161                   | 0                            | 0                           | 0.1                 | 3.0                       | 0.1                  |
| 1/2      | M4 EB Entry Ahead | O         | -          |             | -          | -               | -               | 332                                                     | 1940              | 757                                                                            | 43.9%       | 332                   | 0                            | 0                           | 0.4                 | 4.2                       | 0.4                  |
| 2/1      | SB Entry Left     | O         | -          |             | -          | -               | -               | 369                                                     | 1940              | 1755                                                                           | 21.0%       | 369                   | 0                            | 0                           | 0.1                 | 1.3                       | 0.1                  |
| 3/1      | M4 WB Entry Ahead | U         | B          |             | 1          | 23              | -               | 677                                                     | 1965              | 943                                                                            | 71.8%       | -                     | -                            | -                           | 3.2                 | 17.0                      | 8.6                  |
| 3/2      | M4 WB Entry Ahead | U         | B          |             | 1          | 23              | -               | 307                                                     | 1965              | 943                                                                            | 32.5%       | -                     | -                            | -                           | 0.9                 | 10.8                      | 2.8                  |
| 4/1      | A4810 Entry Ahead | O         | -          |             | -          | -               | -               | 327                                                     | 1940              | 928                                                                            | 35.2%       | 327                   | 0                            | 0                           | 0.3                 | 3.0                       | 0.3                  |
| 4/2      | A4810 Entry Ahead | O         | -          |             | -          | -               | -               | 384                                                     | 1940              | 928                                                                            | 41.4%       | 384                   | 0                            | 0                           | 0.4                 | 3.3                       | 0.4                  |
| 13/1     | Circulatory Right | U         | A          |             | 1          | 13              | -               | 381                                                     | 1940              | 543                                                                            | 70.1%       | -                     | -                            | -                           | 2.9                 | 27.1                      | 5.8                  |
| 13/2     | Circulatory Right | U         | A          |             | 1          | 13              | -               | 152                                                     | 1940              | 543                                                                            | 28.0%       | -                     | -                            | -                           | 0.8                 | 18.7                      | 1.8                  |
| C1       |                   |           |            |             |            |                 |                 | PRC for Signalled Lanes (%):<br>PRC Over All Lanes (%): | 25.4<br>25.4      | Total Delay for Signalled Lanes (pcuHr):<br>Total Delay Over All Lanes(pcuHr): |             |                       | 7.78<br>9.08                 | Cycle Time (s): 50          |                     |                           |                      |

## Basic Results Summary

**Scenario 11: 'Existing AM +50% U turners' (FG11: 'Thur 5 June 2025 AM +50%BB', Plan 1: 'Network Control Plan 1')**

## Network Layout Diagram

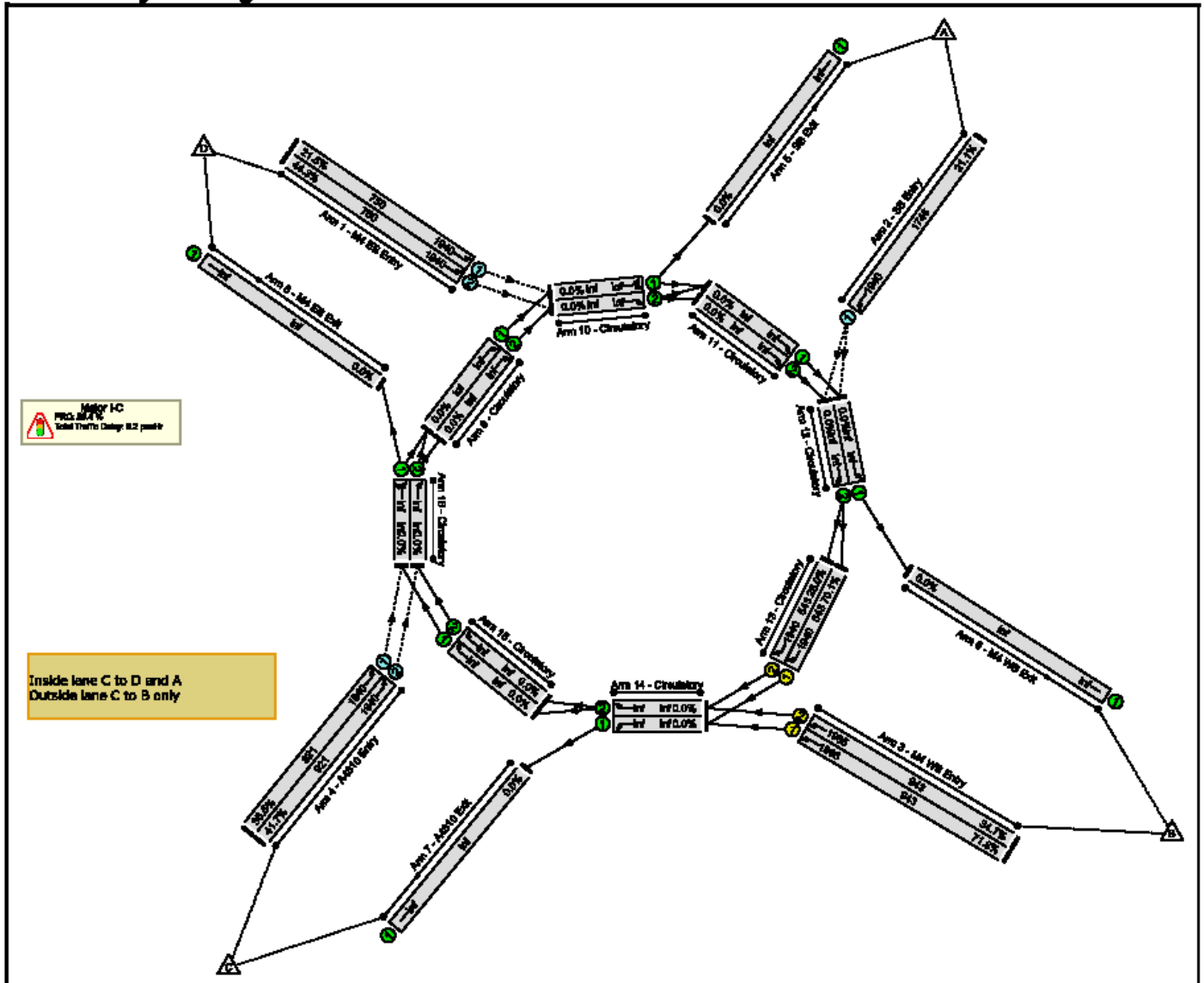


## Network Results

## Basic Results Summary

**Scenario 12: 'Existing PM +50% U turners' (FG12: 'Thur 5 June 2025 PM +50%BB', Plan 1: 'Network Control Plan 1')**

## Network Layout Diagram



# Basic Results Summary

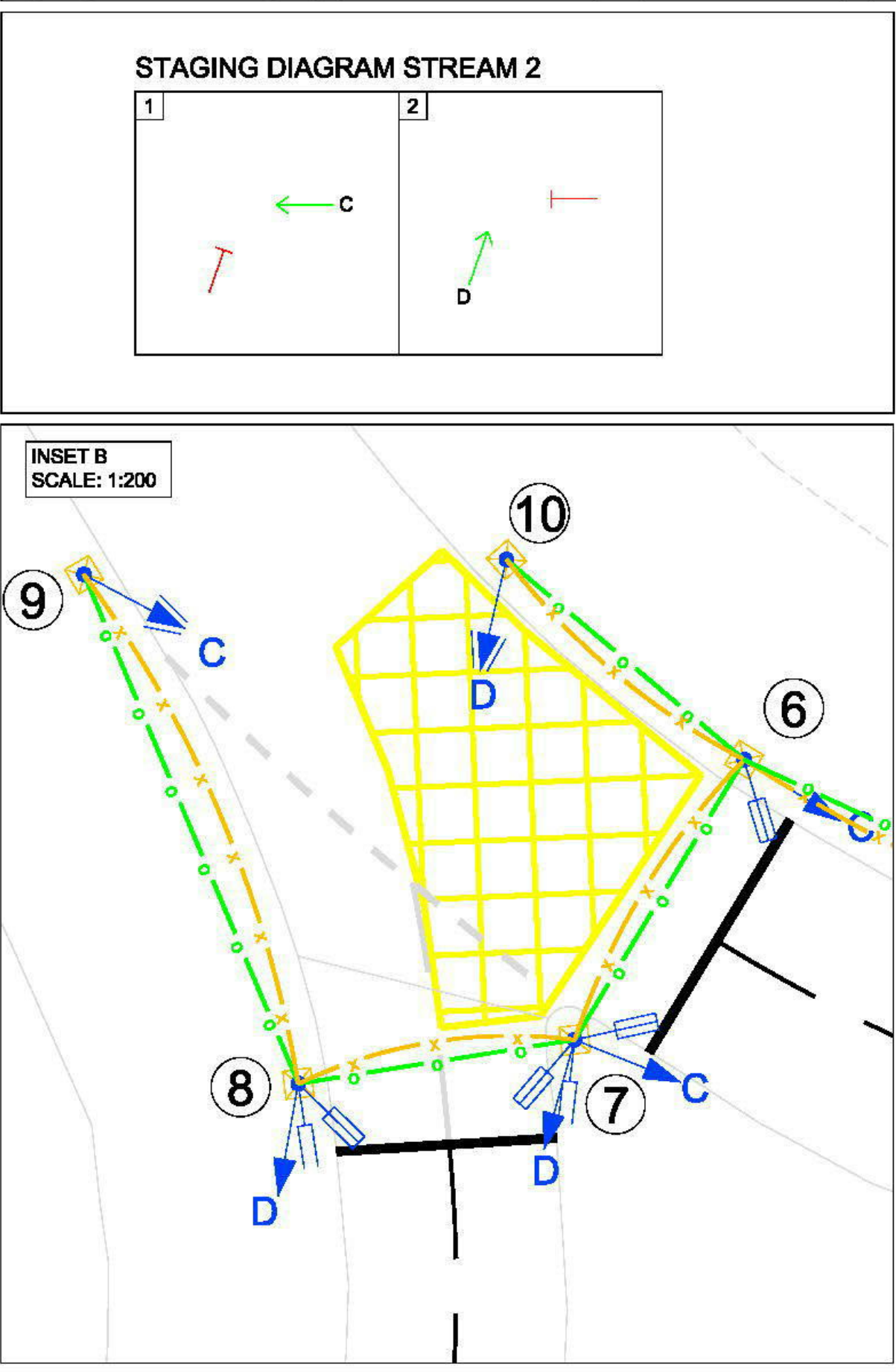
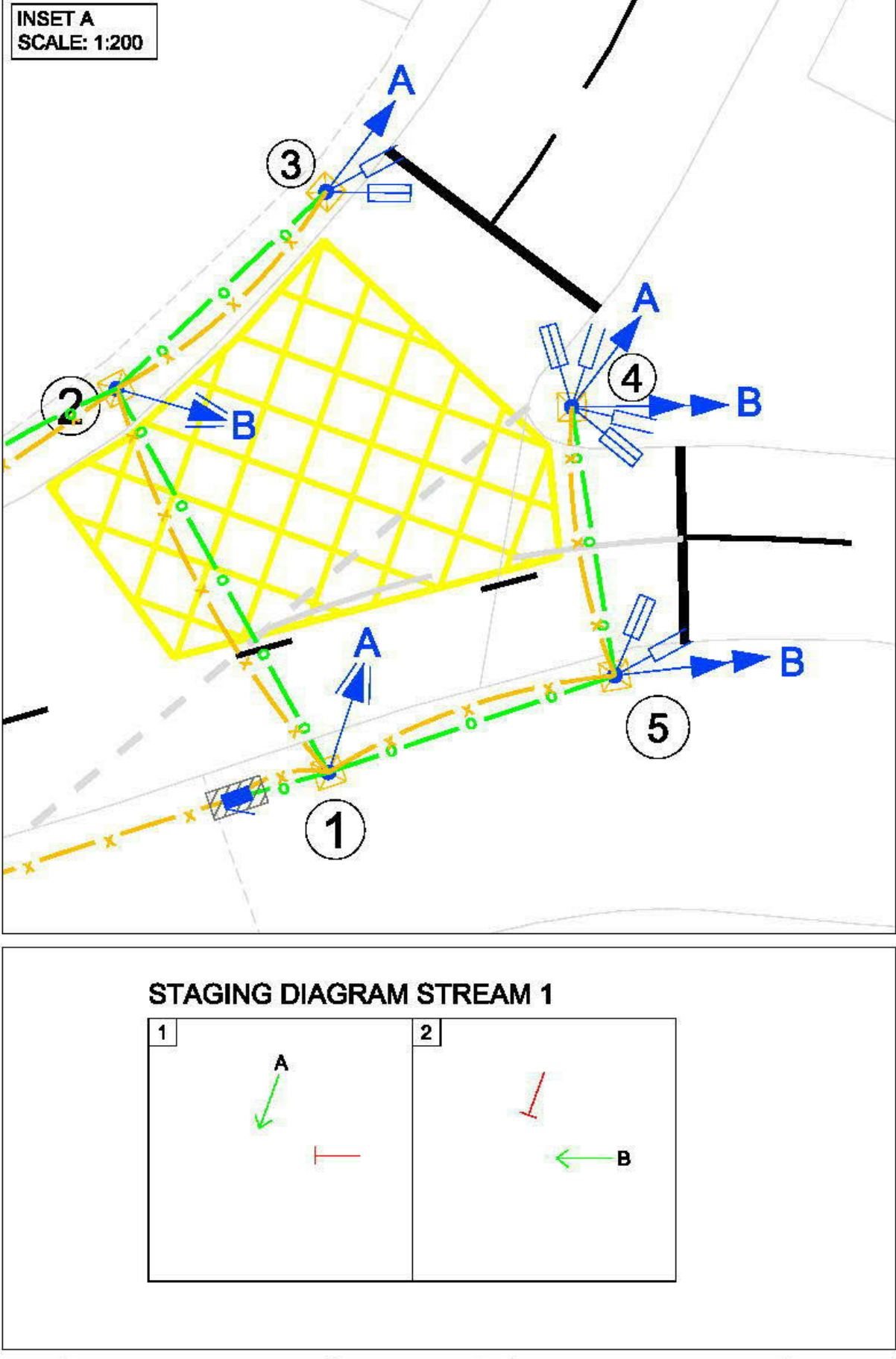
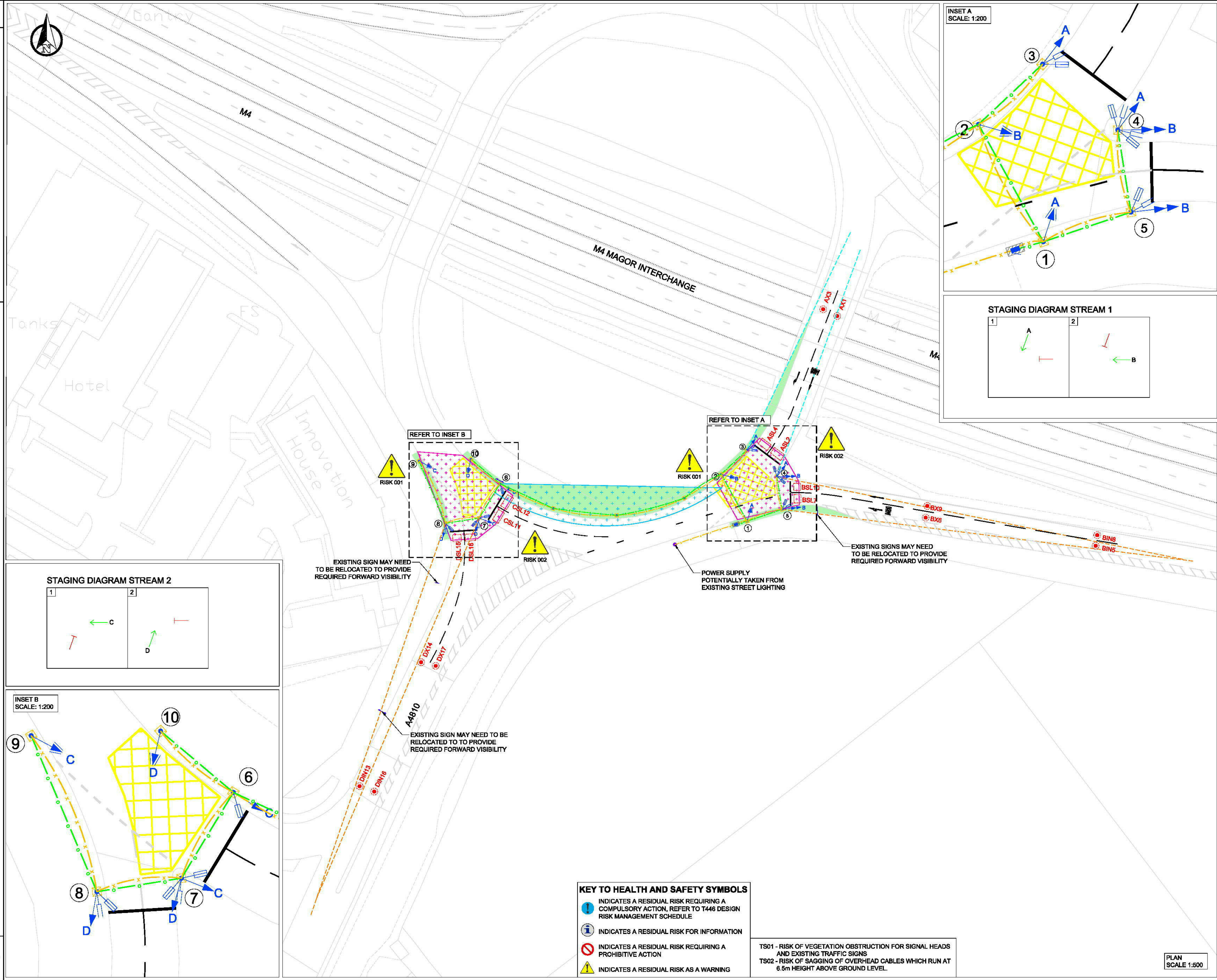
## Network Results

| 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  | -                 | -         | -          |             | -          | -               | -               | -                                                       | -                 | -                                                                              | 71.8%       | 1573                  | 0                            | 0                           | 9.2                 | -                         | -                    |
| Major LC | -                 | -         | -          |             | -          | -               | -               | -                                                       | -                 | -                                                                              | 71.8%       | 1573                  | 0                            | 0                           | 9.2                 | -                         | -                    |
| 1/1      | M4 EB Entry Ahead | O         | -          |             | -          | -               | -               | 161                                                     | 1940              | 750                                                                            | 21.5%       | 161                   | 0                            | 0                           | 0.1                 | 3.1                       | 0.1                  |
| 1/2      | M4 EB Entry Ahead | O         | -          |             | -          | -               | -               | 332                                                     | 1940              | 750                                                                            | 44.3%       | 332                   | 0                            | 0                           | 0.4                 | 4.3                       | 0.4                  |
| 2/1      | SB Entry Left     | O         | -          |             | -          | -               | -               | 369                                                     | 1940              | 1746                                                                           | 21.1%       | 369                   | 0                            | 0                           | 0.1                 | 1.3                       | 0.1                  |
| 3/1      | M4 WB Entry Ahead | U         | B          |             | 1          | 23              | -               | 677                                                     | 1965              | 943                                                                            | 71.8%       | -                     | -                            | -                           | 3.2                 | 17.0                      | 8.6                  |
| 3/2      | M4 WB Entry Ahead | U         | B          |             | 1          | 23              | -               | 327                                                     | 1965              | 943                                                                            | 34.7%       | -                     | -                            | -                           | 1.0                 | 11.0                      | 3.1                  |
| 4/1      | A4810 Entry Ahead | O         | -          |             | -          | -               | -               | 327                                                     | 1940              | 921                                                                            | 35.5%       | 327                   | 0                            | 0                           | 0.3                 | 3.0                       | 0.3                  |
| 4/2      | A4810 Entry Ahead | O         | -          |             | -          | -               | -               | 384                                                     | 1940              | 921                                                                            | 41.7%       | 384                   | 0                            | 0                           | 0.4                 | 3.4                       | 0.4                  |
| 13/1     | Circulatory Right | U         | A          |             | 1          | 13              | -               | 381                                                     | 1940              | 543                                                                            | 70.1%       | -                     | -                            | -                           | 2.9                 | 27.1                      | 5.8                  |
| 13/2     | Circulatory Right | U         | A          |             | 1          | 13              | -               | 152                                                     | 1940              | 543                                                                            | 28.0%       | -                     | -                            | -                           | 0.8                 | 18.7                      | 1.8                  |
| C1       |                   |           |            |             |            |                 |                 | PRC for Signalled Lanes (%):<br>PRC Over All Lanes (%): | 25.4<br>25.4      | Total Delay for Signalled Lanes (pcuHr):<br>Total Delay Over All Lanes(pcuHr): |             |                       | 7.88<br>9.18                 | Cycle Time (s): 50          |                     |                           |                      |

|                                                                  |                                                                                                                                                                                                                                                                                      |                                                                                                                              |
|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| <p><b>9025 – M4 J23a Major Interchange Temporary Signals</b></p> | <div>  </div> <div> <p>Yn gweithio ar ran<br/><b>Llywodraeth Cymru</b><br/>Working on behalf of the<br/><b>Welsh Government</b></p> </div> | <div>  </div> |
|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|

## **APPENDIX D:**

### **Option 2**



- KEY TO HEALTH AND SAFETY SYMBOLS**
- INDICATES A RESIDUAL RISK REQUIRING A COMPULSORY ACTION, REFER TO T446 DESIGN RISK MANAGEMENT SCHEDULE
  - INDICATES A RESIDUAL RISK FOR INFORMATION
  - INDICATES A RESIDUAL RISK REQUIRING A PROHIBITIVE ACTION
  - INDICATES A RESIDUAL RISK AS A WARNING
- TS01 - RISK OF VEGETATION OBSTRUCTION FOR SIGNAL HEADS AND EXISTING TRAFFIC SIGNS  
TS02 - RISK OF SAGGING OF OVERHEAD CABLES WHICH RUN AT 6.5m HEIGHT ABOVE GROUND LEVEL.

**NOTES**

- DO NOT SCALE FROM THIS DRAWING.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS AND DOCUMENTS IN THE DESIGN PACKAGE.
- LAYOUT BASED ON URBAN 64 TEMPORARY TRAFFIC SIGNALS.
- ALL CABLES TO BE OVERHEAD AND MINIMUM 6.5 METRES ABOVE GROUND LEVEL.
- POWER SUPPLY TO BE TAKEN FROM STREET LIGHTING APPARATUS (EITHER COLUMN OR FEEDER PILLAR TO BE DETERMINED).
- TEMPORARY BARRIERS TO BE PROVIDED AROUND SIGNAL POLES TO PROTECT EQUIPMENT AND ROAD USERS.
- SPEED LIMIT TO BE REDUCED TO 40MPH ON APPROACHES TO TEMPORARY TRAFFIC SIGNALS.
- POSITION OF POLES, CONTROLLERS AND TRAFFIC SIGNS AND ROAD MARKINGS ARE BASED ON THE OS MAP DUE TO THE UNAVAILABILITY OF TOPO SURVEY.

**KEY:**

- REQUIRED FORWARD VISIBILITY AS PER DMRB FOR 40mph
- REQUIRED JUNCTION INTERVISIBILITY ZONE AS PER TSM CH6
- FORWARD VISIBILITY IN CIRCULARITY AS PER DMRB CD116 (70m)
- FORWARD VISIBILITY IN CIRCULARITY AS PER DMRB CD116 (70M)
- VEGETATION TO BE CLEARED TO PROVIDE REQUIRED VISIBILITY/ ROOM FOR POLES AND ABOVE GROUND CABLES
- TRAFFIC SIGNAL CONTROLLER
- CONCRETE BLOCK 1000mm X 1000mm FOR TRAFFIC SIGNAL POLES AND CONTROLLER
- 6.5m HIGH TRAFFIC SIGNAL POLE
- RAG PRIMARY SIGNAL HEAD
- RAG PRIMARY SIGNAL HEAD HIGH LEVEL REPEATER
- RAG SECONDARY SIGNAL HEAD
- ABOVE GROUND MOVA VEHICLE DETECTOR
- STOP LINE DETECTORS
- ELECTRIC CABLE FOR SIGNALS 6.5m ABOVE THE GROUND LEVEL
- DATA CABLE 6.5M ABOVE THE GROUND LEVEL
- VIRTUAL MOVA DETECTION ZONES
- VIRTUAL STOP LINE DETECTION ZONES
- PROPOSED ROAD MARKINGS
- PROPOSED YELLOW BOX
- PROPOSED HARD STANDING AREA

|     |                                 |    |    |     |            |
|-----|---------------------------------|----|----|-----|------------|
| PO2 | CLIENT COMMENT YELLOW BOX ADDED | GV | ML | SJB | 18/09/2025 |
| Rev | Details                         | Dr | Ch | Ap  | Date       |

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wsp.com

Project  
M4 J23A MAGOR INTERCHANGE  
TEMPORARY SIGNALS  
OPTION 2  
SIGNALISE M4 W/B OFF SLIP ROAD AND A4810

|             |                    |              |            |          |            |
|-------------|--------------------|--------------|------------|----------|------------|
| File No.    | Financial Code No. | 25/SW/CSW005 |            |          |            |
| Drawn       | GV                 | Created      | ML         | Approved | SJB        |
| Date        | 10/09/2025         | Date         | 15/09/2025 | Date     | 15/09/2025 |
| Scale       | AS SHOWN           |              |            |          |            |
| Drawing No. | UK0029359.3987-002 |              |            |          |            |

P02

PLAN  
SCALE 1:500

# Basic Results Summary

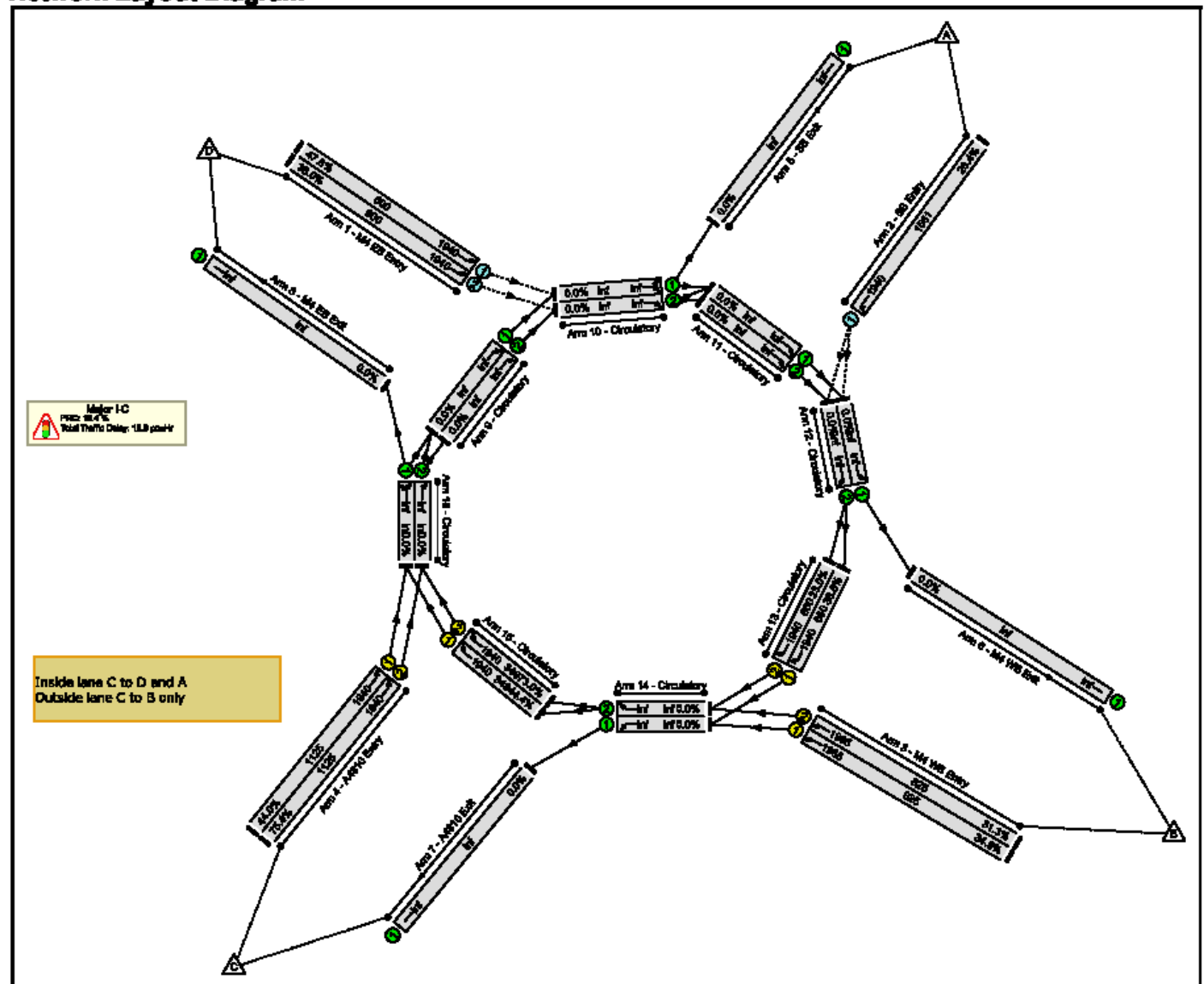
## Basic Results Summary

### User and Project Details

|                    |                                                              |
|--------------------|--------------------------------------------------------------|
| Project:           | SWTRA-9025-25.SW.CSI.005-M4 J23a MAGOR I-C TEMPORARY SIGNALS |
| Title:             |                                                              |
| Location:          | MAGOR I-C                                                    |
| Model Purpose:     | Option 2 Signals on M4 westbound off slip road and A4810     |
| Additional detail: |                                                              |
| File name:         | M4 J23a Option 2.lsg3x                                       |
| Author:            |                                                              |
| Company:           | WSP                                                          |
| Address:           | Noida                                                        |

### Scenario 7: 'Existing AM' (FG7: 'Thur 5 June 2025 AM', Plan 1: 'Network Control Plan 1')

#### Network Layout Diagram



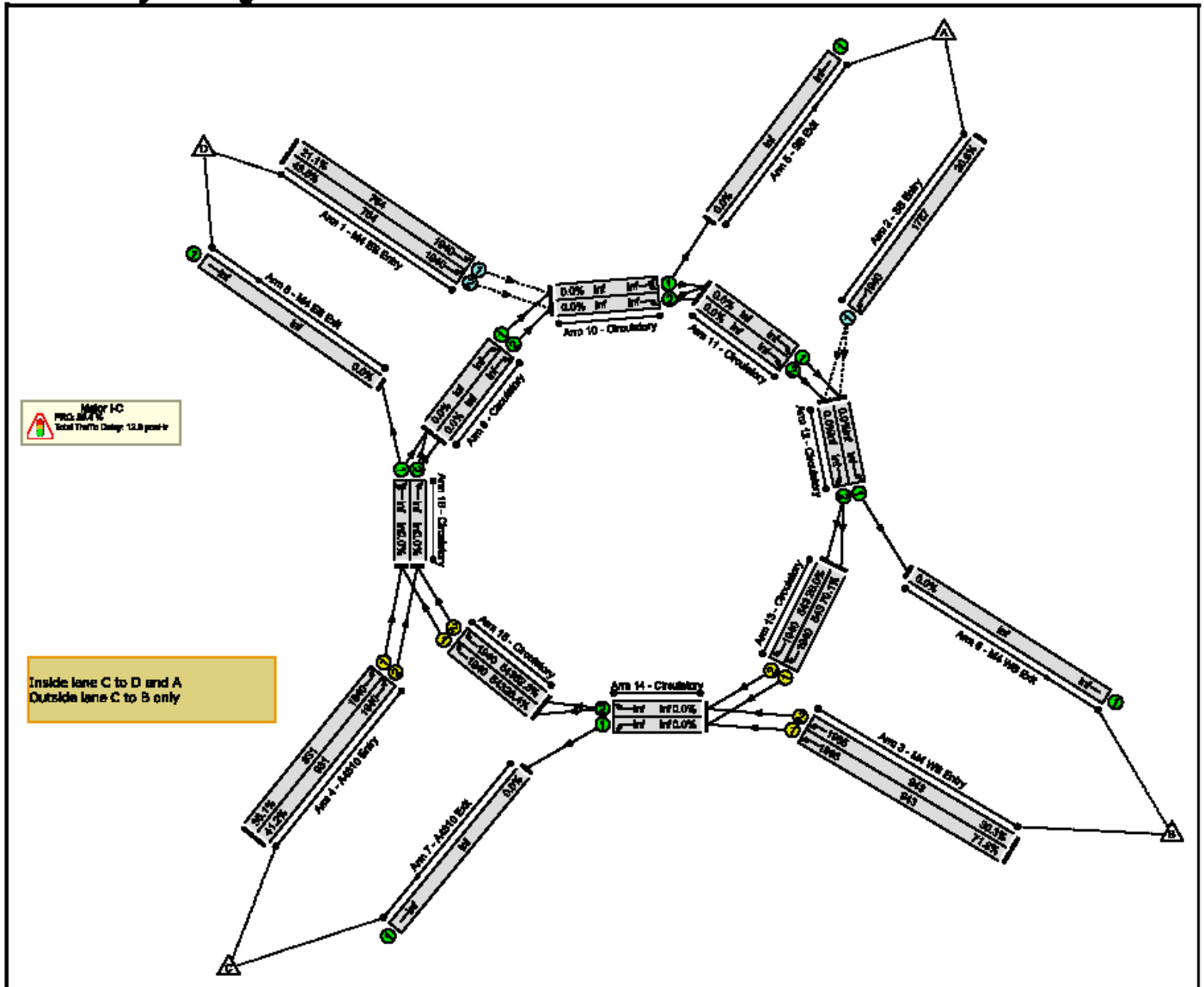
## Network Results

|    |                                        |       |                                          |       |                 |    |
|----|----------------------------------------|-------|------------------------------------------|-------|-----------------|----|
| C1 | Stream: 1 PRC for Signalled Lanes (%): | 133.7 | Total Delay for Signalled Lanes (pcuHr): | 3.81  | Cycle Time (s): | 50 |
| C1 | Stream: 2 PRC for Signalled Lanes (%): | 19.4  | Total Delay for Signalled Lanes (pcuHr): | 8.08  | Cycle Time (s): | 50 |
|    | PRC Over All Lanes (%):                | 19.4  | Total Delay Over All Lanes (pcuHr):      | 12.81 |                 |    |

## Basic Results Summary

**Scenario 8: 'Existing PM'** (FG8: 'Thur 5 June 2025 PM', Plan 1: 'Network Control Plan 1')

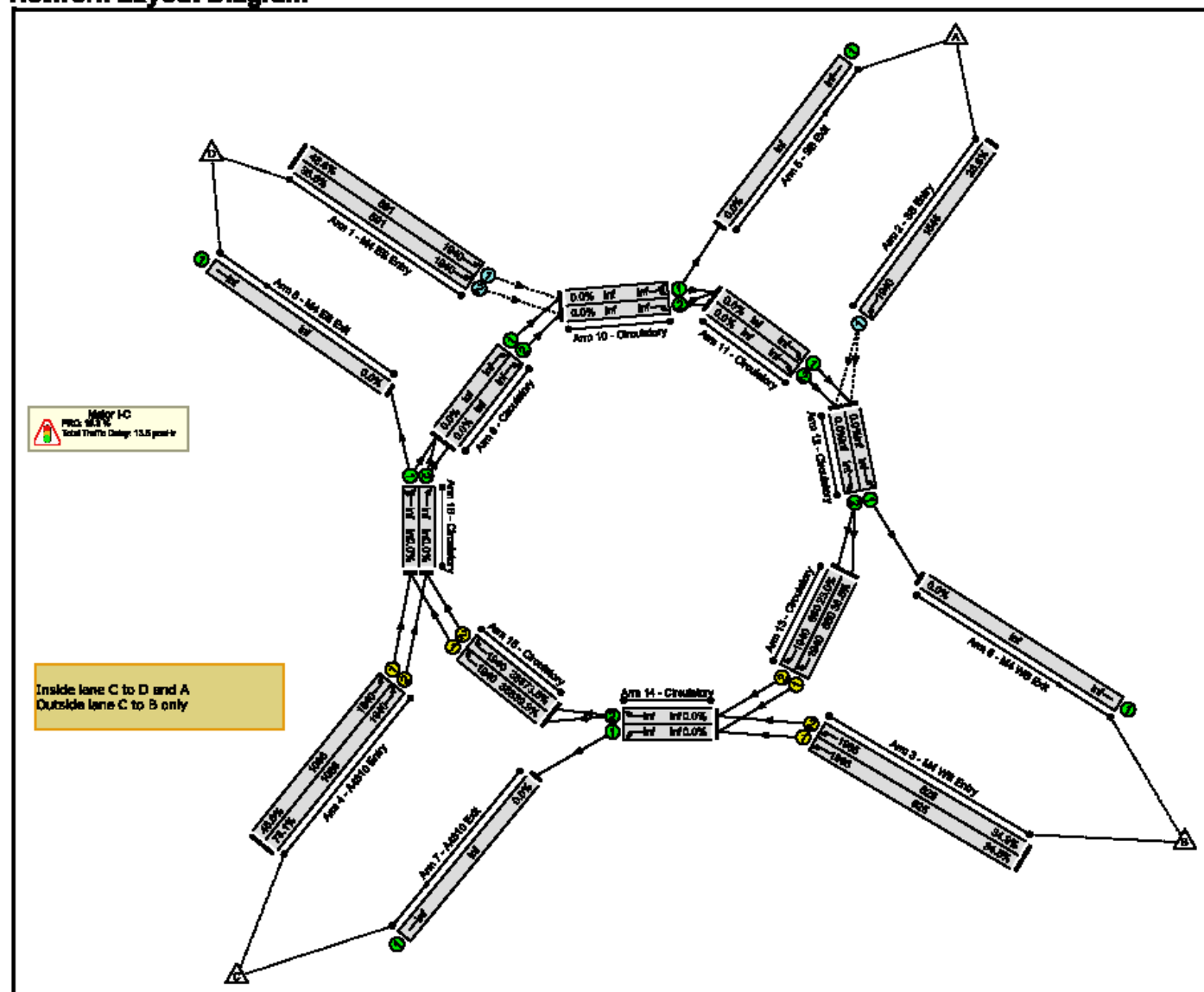
## Network Layout Diagram



## Network Results

|    |                                        |      |                                          |       |                 |    |
|----|----------------------------------------|------|------------------------------------------|-------|-----------------|----|
| C1 | Stream: 1 PRC for Signalled Lanes (%): | 25.4 | Total Delay for Signalled Lanes (pcuHr): | 7.70  | Cycle Time (s): | 50 |
| C1 | Stream: 2 PRC for Signalled Lanes (%): | 72.1 | Total Delay for Signalled Lanes (pcuHr): | 4.43  | Cycle Time (s): | 50 |
|    | PRC Over All Lanes (%):                | 25.4 | Total Delay Over All Lanes (pcuHr):      | 12.78 |                 |    |

### Network Layout Diagram



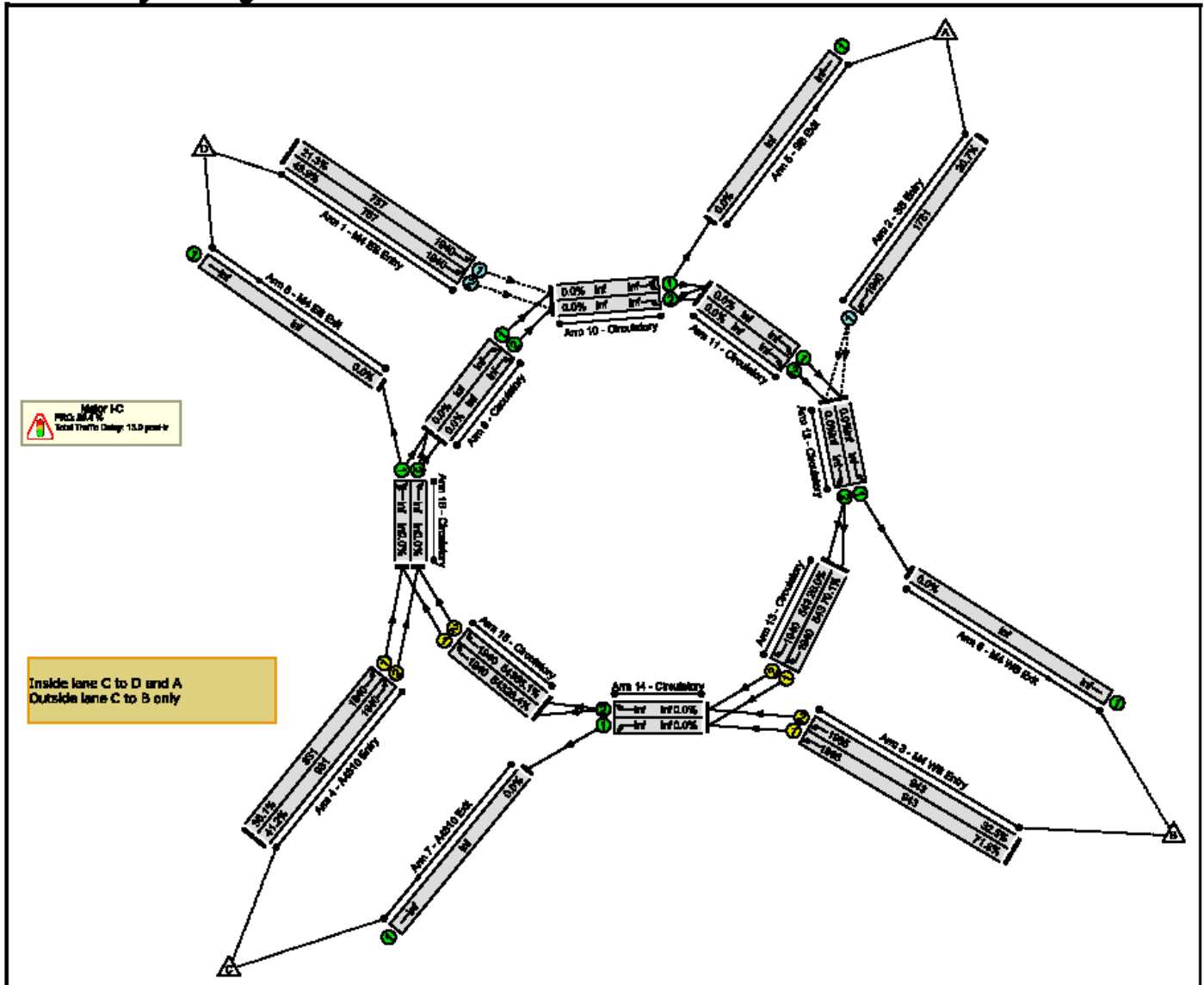
## Network Results

|    |                                        |       |                                          |       |                 |    |
|----|----------------------------------------|-------|------------------------------------------|-------|-----------------|----|
| C1 | Stream: 1 PRC for Signalled Lanes (%): | 133.7 | Total Delay for Signalled Lanes (pcuHr): | 3.94  | Cycle Time (s): | 50 |
| C1 | Stream: 2 PRC for Signalled Lanes (%): | 15.3  | Total Delay for Signalled Lanes (pcuHr): | 8.80  | Cycle Time (s): | 50 |
|    | PRC Over All Lanes (%):                | 15.3  | Total Delay Over All Lanes (pcuHr):      | 13.51 |                 |    |

## Basic Results Summary

**Scenario 10: 'Existing PM +25% U turners'** (FG10: 'Thur 5 June 2025 PM +25%BB', Plan 1: 'Network Control Plan 1')

## Network Layout Diagram

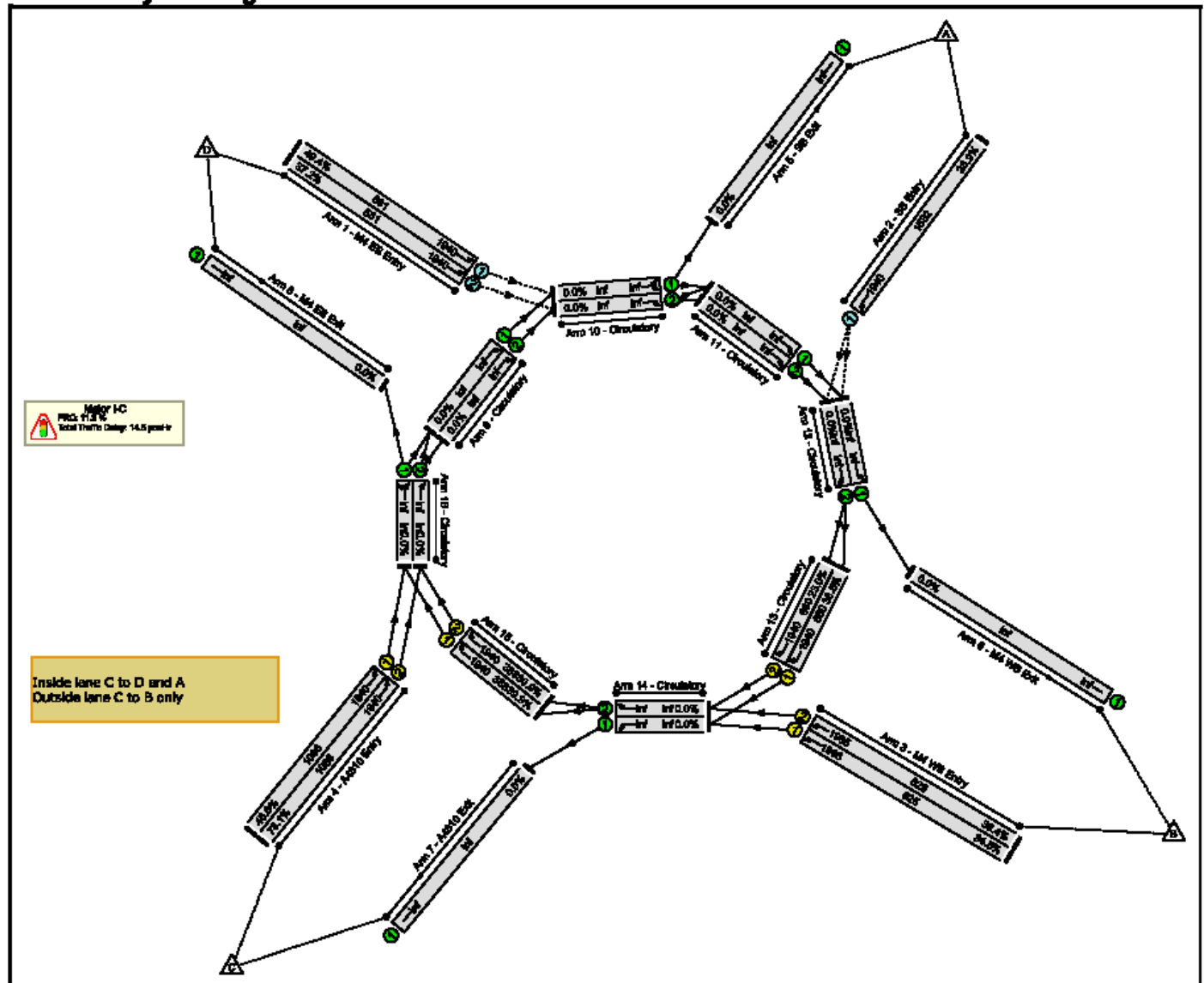


## Network Results

|    |                                        |      |                                          |       |                 |    |
|----|----------------------------------------|------|------------------------------------------|-------|-----------------|----|
| C1 | Stream: 1 PRC for Signalled Lanes (%): | 25.4 | Total Delay for Signalled Lanes (pcuHr): | 7.78  | Cycle Time (s): | 60 |
| C1 | Stream: 2 PRC for Signalled Lanes (%): | 60.3 | Total Delay for Signalled Lanes (pcuHr): | 4.58  | Cycle Time (s): | 60 |
|    | PRC Over All Lanes (%):                | 25.4 | Total Delay Over All Lanes (pcuHr):      | 13.02 |                 |    |

**Scenario 11: 'Existing AM +50% U turners' (FG11: 'Thur 5 June 2025 AM +50%BB', Plan 1: 'Network Control Plan 1')**

### Network Layout Diagram



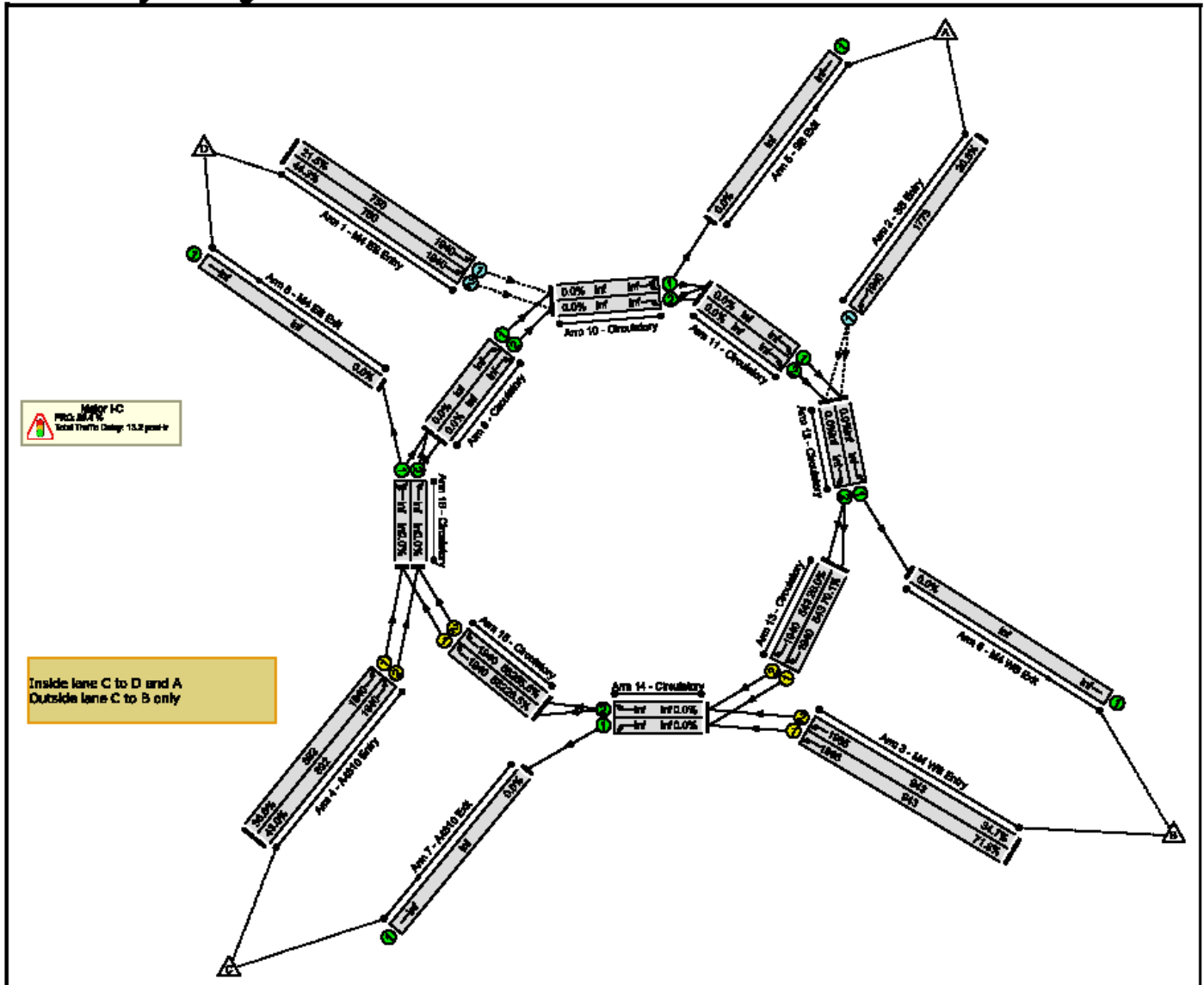
## Network Results

|    |                                        |       |                                          |       |                 |    |
|----|----------------------------------------|-------|------------------------------------------|-------|-----------------|----|
| C1 | Stream: 1 PRC for Signalled Lanes (%): | 133.7 | Total Delay for Signalled Lanes (pcuHr): | 4.08  | Cycle Time (s): | 50 |
| C1 | Stream: 2 PRC for Signalled Lanes (%): | 11.2  | Total Delay for Signalled Lanes (pcuHr): | 9.42  | Cycle Time (s): | 50 |
|    | PRC Over All Lanes (%):                | 11.2  | Total Delay Over All Lanes(pcuHr):       | 14.49 |                 |    |

## Basic Results Summary

**Scenario 12: 'Existing PM +50% U turners' (FG12: 'Thur 5 June 2025 PM +50%BB', Plan 1: 'Network Control Plan 1')**

## Network Layout Diagram



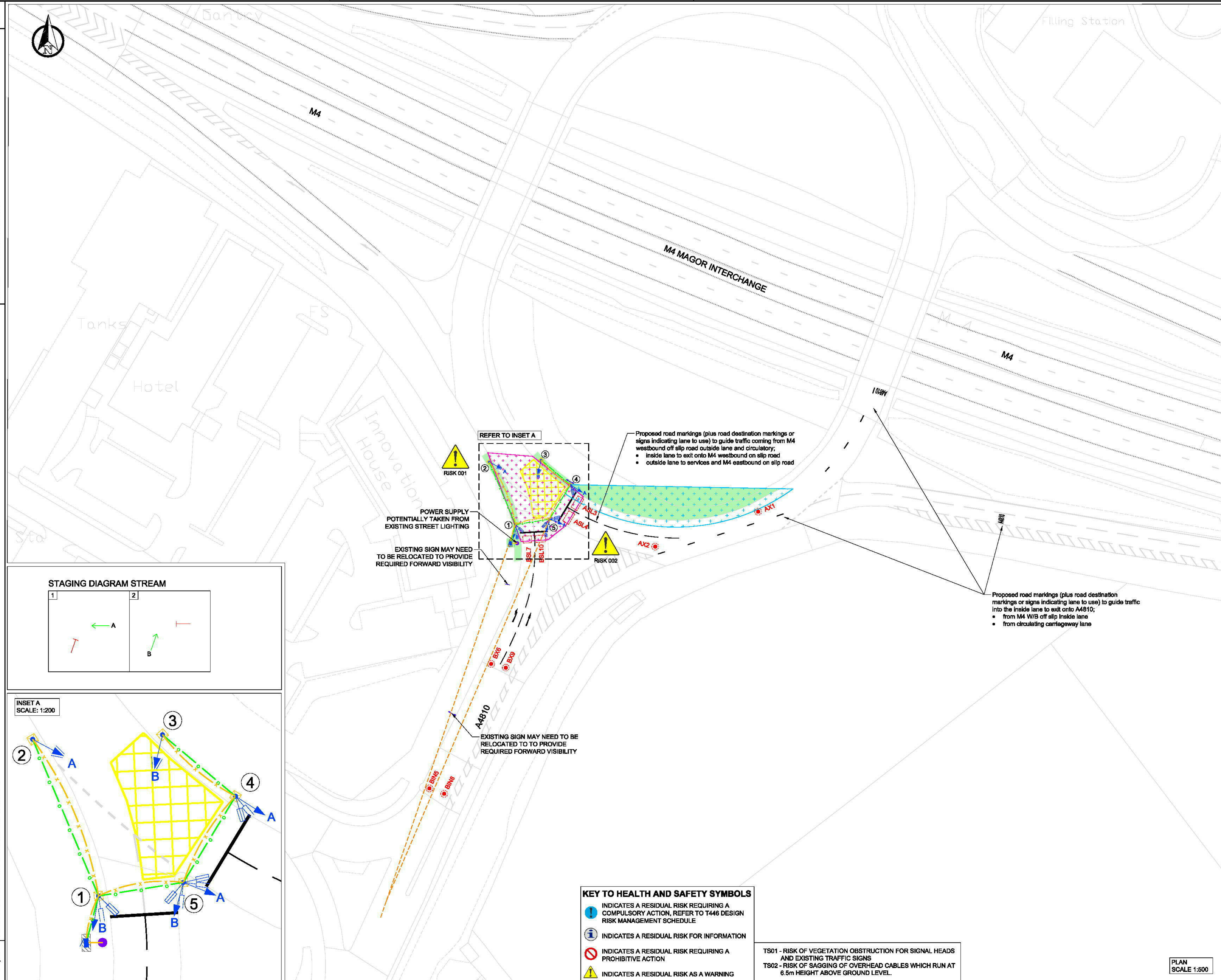
## Network Results

|    |                                        |      |                                          |       |                 |    |
|----|----------------------------------------|------|------------------------------------------|-------|-----------------|----|
| C1 | Stream: 1 PRC for Signalled Lanes (%): | 25.4 | Total Delay for Signalled Lanes (pcuHr): | 7.86  | Cycle Time (s): | 50 |
| C1 | Stream: 2 PRC for Signalled Lanes (%): | 61.2 | Total Delay for Signalled Lanes (pcuHr): | 4.70  | Cycle Time (s): | 50 |
|    | PRC Over All Lanes (%):                | 25.4 | Total Delay Over All Lanes (pcuHr):      | 13.22 |                 |    |

|                                                                  |                                                                                                                                                                                                                                                                                      |                                                                                                                              |
|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| <p><b>9025 – M4 J23a Major Interchange Temporary Signals</b></p> | <div>  </div> <div> <p>Yn gweithio ar ran<br/><b>Llywodraeth Cymru</b><br/>Working on behalf of the<br/><b>Welsh Government</b></p> </div> | <div>  </div> |
|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|

## **APPENDIX E:**

### **Option 3**



1. DO NOT SCALE FROM THIS DRAWING.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS AND DOCUMENTS IN THE DESIGN PACKAGE.
3. LAYOUT BASED ON URBAN 64 TEMPORARY TRAFFIC SIGNALS.
4. ALL CABLES TO BE OVERHEAD AND MINIMUM 6.5 METRES ABOVE GROUND LEVEL.
5. POWER SUPPLY TO BE TAKEN FROM STREET LIGHTING APPARATUS (EITHER COLUMN OR FEEDER PILLAR TO BE DETERMINED).
6. TEMPORARY BARRIERS TO BE PROVIDED AROUND SIGNAL POLES TO PROTECT EQUIPMENT AND ROAD USERS.
7. SPEED LIMIT TO BE READDED TO 40MPH ON APPROACHES TO TEMPORARY TRAFFIC SIGNALS.
8. POSITION OF POLES, CONTROLLERS AND TRAFFIC SIGNS AND ROAD MARKINGS ARE BASED ON THE OS MAP DUE TO THE UNAVAILABILITY OF TOPO SURVEY.

**KEY:**

- |  |                                                                                                 |
|--|-------------------------------------------------------------------------------------------------|
|  | REQUIRED FORWARD VISIBILITY AS PER DMRB FOR 40mph                                               |
|  | REQUIRED JUNCTION INTERVISIBILITY ZONE AS PER TSM CH6                                           |
|  | FORWARD VISIBILITY IN CIRCULATORY AS PER DMRB CD115 (70m)                                       |
|  | FORWARD VISIBILITY IN CIRCULATORY AS PER DMRB CD115 (70M)                                       |
|  | VEGETATION TO BE CLEARED TO PROVIDE REQUIRED VISIBILITY/ ROOM FOR POLES AND ABOVE GROUND CABLES |
|  | TRAFFIC SIGNAL CONTROLLER                                                                       |
|  | CONCRETE BLOCK 1000mm X 1000mm FOR TRAFFIC SIGNAL POLES AND CONTROLLER                          |
|  | 6.5m HIGH TRAFFIC SIGNAL POLE                                                                   |
|  | RAG PRIMARY SIGNAL HEAD                                                                         |
|  | RAG PRIMARY SIGNAL HEAD HIGH LEVEL REPEATER                                                     |
|  | RAG SECONDARY SIGNAL HEAD                                                                       |
|  | ABOVE GROUND MOVA VEHICLE DETECTOR                                                              |
|  | STOP LINE DETECTORS                                                                             |
|  | ELECTRIC CABLE FOR SIGNALS 6.5m ABOVE THE GROUND LEVEL                                          |
|  | DATA CABLE 6.5M ABOVE THE GROUND LEVEL                                                          |
|  | VIRTUAL MOVA DETECTION ZONES                                                                    |
|  | VIRTUAL STOP LINE DETECTION ZONES                                                               |
|  | PROPOSED ROAD MARKINGS                                                                          |
|  | PROPOSED YELLOW BOX                                                                             |
|  | PROPOSED HARD STANDING AREA                                                                     |

|     |                                 |    |    |     |          |
|-----|---------------------------------|----|----|-----|----------|
| P02 | CLIENT COMMENT YELLOW BOX ADDED | GV | ML | SJB | 16/09/20 |
| P01 | FIRST ISSUE                     | GV | ML | SJB | 10/09/20 |
| Rev | Details                         | Dr | Ch | Ap  | Date     |



Llywodraeth Cymru  
Welsh Government



**South Wales Trunk Road Agent**  
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project

M4 J23A MAGOR INTERCHANGE

TEMPORARY SIGNALS

OPTION 3

SIGNAL USE A4810

|             |            |                                  |            |          |            |
|-------------|------------|----------------------------------|------------|----------|------------|
| File No.    |            | Financial Code No. 25/SW/CSI/005 |            |          |            |
| Drawn       | GV         | Checked                          | ML         | Approved | SJB        |
| Date        | 10/09/2025 | Date                             | 15/09/2025 | Date     | 15/09/2025 |
| Location    |            | AS SHOWN                         |            |          |            |
| Drawing No. |            | UK0029359.3987-003               |            |          | P02        |

# Basic Results Summary

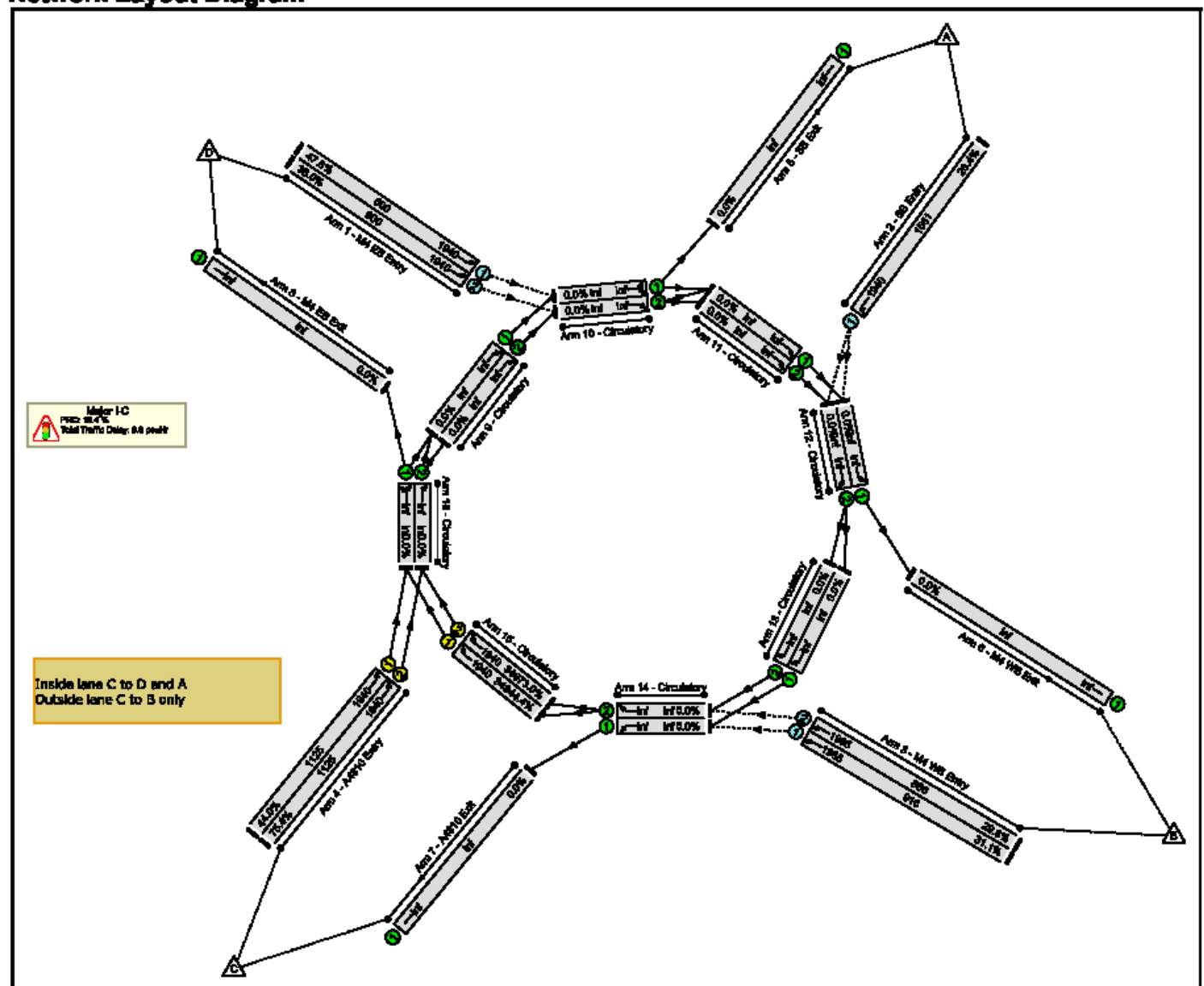
## Basic Results Summary

### User and Project Details

|                    |                                                              |
|--------------------|--------------------------------------------------------------|
| Project:           | SWTRA-9025-25.SW.CSI.005-M4 J23a MAGOR I-C TEMPORARY SIGNALS |
| Title:             |                                                              |
| Location:          | MAGOR I-C                                                    |
| Model Purpose:     | Option 3 Signals on A4810                                    |
| Additional detail: |                                                              |
| File name:         | M4 J23a Option 3.lsg3x                                       |
| Author:            |                                                              |
| Company:           | WSP                                                          |
| Address:           | Noida                                                        |

### Scenario 7: 'Existing AM' (FG7: 'Thur 5 June 2025 AM', Plan 1: 'Network Control Plan 1')

#### Network Layout Diagram

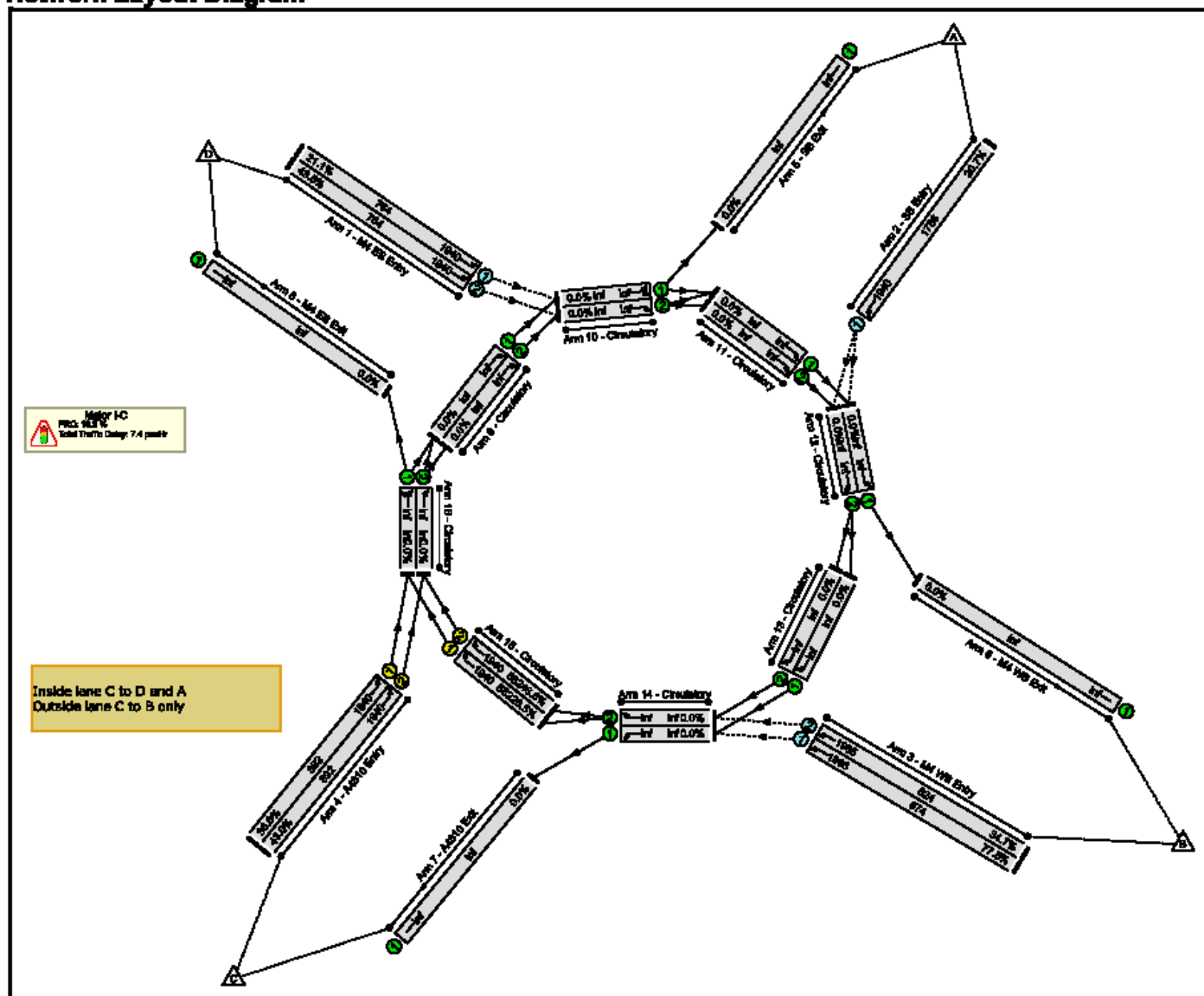


# Basic Results Summary

## 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  | -                 | -         | -          |             | -                            | -               | -               | -                                        | -                 | -              | 75.4%       | 1489                  | 0                            | 0                           | 9.8                 | -                         | -                    |
| Major LC | -                 | -         | -          |             | -                            | -               | -               | -                                        | -                 | -              | 75.4%       | 1489                  | 0                            | 0                           | 9.8                 | -                         | -                    |
| 1/1      | M4 EB Entry Ahead | O         | -          |             | -                            | -               | -               | 287                                      | 1940              | 600            | 47.8%       | 287                   | 0                            | 0                           | 0.5                 | 5.7                       | 0.5                  |
| 1/2      | M4 EB Entry Ahead | O         | -          |             | -                            | -               | -               | 216                                      | 1940              | 600            | 38.0%       | 216                   | 0                            | 0                           | 0.3                 | 4.7                       | 0.3                  |
| 2/1      | SB Entry Left     | O         | -          |             | -                            | -               | -               | 443                                      | 1940              | 1561           | 28.4%       | 443                   | 0                            | 0                           | 0.2                 | 1.6                       | 0.2                  |
| 3/1      | M4 WB Entry Ahead | O         | -          |             | -                            | -               | -               | 285                                      | 1965              | 916            | 31.1%       | 285                   | 0                            | 0                           | 0.2                 | 2.8                       | 0.2                  |
| 3/2      | M4 WB Entry Ahead | O         | -          |             | -                            | -               | -               | 258                                      | 1965              | 866            | 29.8%       | 258                   | 0                            | 0                           | 0.2                 | 3.0                       | 0.2                  |
| 4/1      | A4810 Entry Ahead | U         | B          |             | 1                            | 28              | -               | 495                                      | 1940              | 1125           | 44.0%       | -                     | -                            | -                           | 1.2                 | 8.8                       | 4.2                  |
| 4/2      | A4810 Entry Ahead | U         | B          |             | 1                            | 28              | -               | 648                                      | 1940              | 1125           | 75.4%       | -                     | -                            | -                           | 3.4                 | 14.3                      | 10.2                 |
| 15/1     | Circulatory Right | U         | A          |             | 1                            | 8               | -               | 155                                      | 1940              | 349            | 44.4%       | -                     | -                            | -                           | 1.2                 | 27.5                      | 2.3                  |
| 15/2     | Circulatory Right | U         | A          |             | 1                            | 8               | -               | 255                                      | 1940              | 349            | 73.0%       | -                     | -                            | -                           | 2.7                 | 38.0                      | 4.6                  |
| C1       |                   |           |            |             | PRC for Signalled Lanes (%): |                 | 19.4            | Total Delay for Signalled Lanes (pcuHr): |                   |                |             | 8.44                  | Cycle Time (s): 50           |                             |                     |                           |                      |
|          |                   |           |            |             | PRC Over All Lanes (%):      |                 | 19.4            | Total Delay Over All Lanes (pcuHr):      |                   |                |             | 9.81                  |                              |                             |                     |                           |                      |

### Network Layout Diagram



# Basic Results Summary

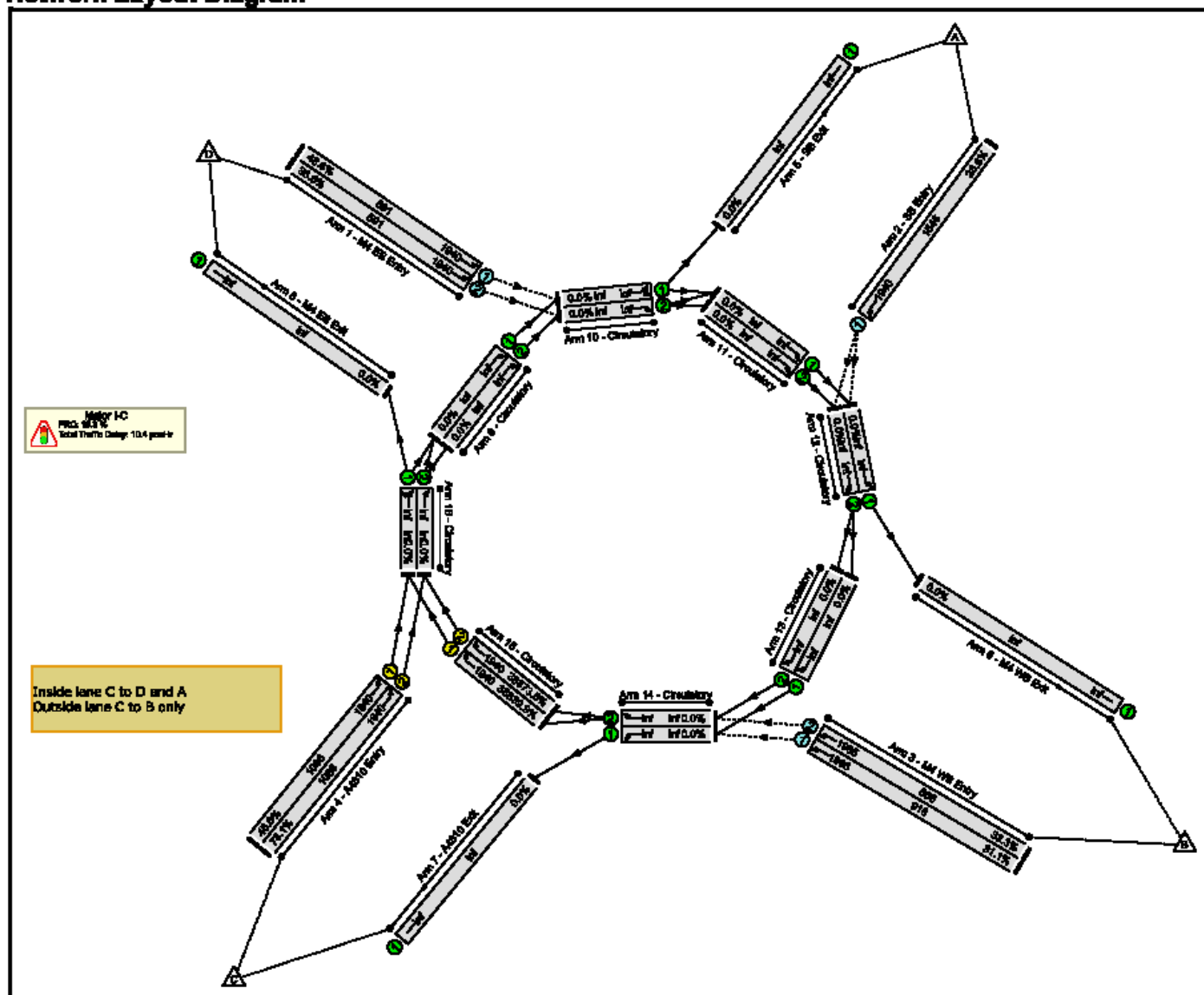
## Network Results

| 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  | -                 | -         | -          |             | -          | -               | -               | -                                                                 | -                                                                                         | -              | 77.5%       | 1825                  | 0                            | 0                           | 7.4                 | -                         | -                    |
| Major LC | -                 | -         | -          |             | -          | -               | -               | -                                                                 | -                                                                                         | -              | 77.5%       | 1825                  | 0                            | 0                           | 7.4                 | -                         | -                    |
| 1/1      | M4 EB Entry Ahead | O         | -          |             | -          | -               | -               | 161                                                               | 1940                                                                                      | 764            | 21.1%       | 161                   | 0                            | 0                           | 0.1                 | 3.0                       | 0.1                  |
| 1/2      | M4 EB Entry Ahead | O         | -          |             | -          | -               | -               | 332                                                               | 1940                                                                                      | 764            | 43.5%       | 332                   | 0                            | 0                           | 0.4                 | 4.2                       | 0.4                  |
| 2/1      | SB Entry Left     | O         | -          |             | -          | -               | -               | 369                                                               | 1940                                                                                      | 1786           | 20.7%       | 369                   | 0                            | 0                           | 0.1                 | 1.3                       | 0.1                  |
| 3/1      | M4 WB Entry Ahead | O         | -          |             | -          | -               | -               | 677                                                               | 1965                                                                                      | 874            | 77.5%       | 677                   | 0                            | 0                           | 1.7                 | 8.0                       | 1.7                  |
| 3/2      | M4 WB Entry Ahead | O         | -          |             | -          | -               | -               | 286                                                               | 1965                                                                                      | 824            | 34.7%       | 286                   | 0                            | 0                           | 0.3                 | 3.3                       | 0.3                  |
| 4/1      | A4810 Entry Ahead | U         | B          |             | 1          | 22              | -               | 327                                                               | 1940                                                                                      | 892            | 36.6%       | -                     | -                            | -                           | 1.1                 | 12.0                      | 3.2                  |
| 4/2      | A4810 Entry Ahead | U         | B          |             | 1          | 22              | -               | 384                                                               | 1940                                                                                      | 892            | 43.0%       | -                     | -                            | -                           | 1.3                 | 12.6                      | 3.9                  |
| 15/1     | Circulatory Right | U         | A          |             | 1          | 14              | -               | 154                                                               | 1940                                                                                      | 582            | 26.5%       | -                     | -                            | -                           | 0.7                 | 17.5                      | 1.8                  |
| 15/2     | Circulatory Right | U         | A          |             | 1          | 14              | -               | 284                                                               | 1940                                                                                      | 582            | 48.8%       | -                     | -                            | -                           | 1.6                 | 20.4                      | 3.7                  |
| C1       |                   |           |            |             |            |                 |                 | PRC for Signalled Lanes (%): 84.4<br>PRC Over All Lanes (%): 16.2 | Total Delay for Signalled Lanes (pcuHr): 4.79<br>Total Delay Over All Lanes (pcuHr): 7.39 |                |             |                       | Cycle Time (s): 50           |                             |                     |                           |                      |

## Basic Results Summary

**Scenario 9: 'Existing AM +25% U turners' (FG9: 'Thur 5 June 2025 AM +25%BB', Plan 1: 'Network Control Plan 1')**

## Network Layout Diagram



# Basic Results Summary

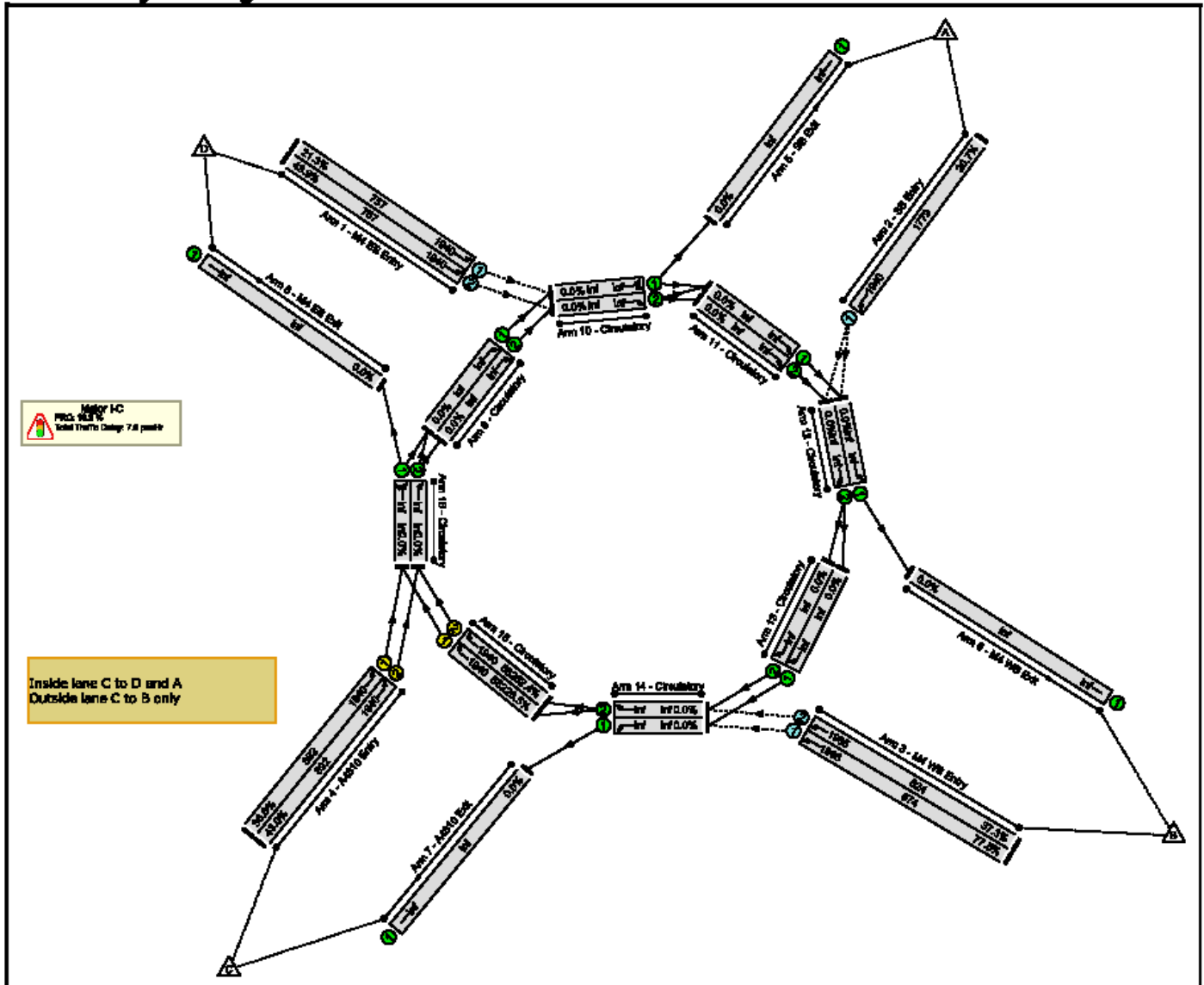
## Network Results

| 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  | -                 | -         | -          |             | -          | -               | -               | -                                                       | -                 | -                                                                               | 78.1%       | 1519                  | 0                            | 0                           | 10.4                | -                         | -                    |
| Major LC | -                 | -         | -          |             | -          | -               | -               | -                                                       | -                 | -                                                                               | 78.1%       | 1519                  | 0                            | 0                           | 10.4                | -                         | -                    |
| 1/1      | M4 EB Entry Ahead | O         | -          |             | -          | -               | -               | 287                                                     | 1940              | 591                                                                             | 48.6%       | 287                   | 0                            | 0                           | 0.5                 | 5.9                       | 0.5                  |
| 1/2      | M4 EB Entry Ahead | O         | -          |             | -          | -               | -               | 216                                                     | 1940              | 591                                                                             | 38.6%       | 216                   | 0                            | 0                           | 0.3                 | 4.8                       | 0.3                  |
| 2/1      | SB Entry Left     | O         | -          |             | -          | -               | -               | 443                                                     | 1940              | 1546                                                                            | 28.6%       | 443                   | 0                            | 0                           | 0.2                 | 1.6                       | 0.2                  |
| 3/1      | M4 WB Entry Ahead | O         | -          |             | -          | -               | -               | 285                                                     | 1965              | 916                                                                             | 31.1%       | 285                   | 0                            | 0                           | 0.2                 | 2.8                       | 0.2                  |
| 3/2      | M4 WB Entry Ahead | O         | -          |             | -          | -               | -               | 288                                                     | 1965              | 866                                                                             | 33.3%       | 288                   | 0                            | 0                           | 0.2                 | 3.1                       | 0.2                  |
| 4/1      | A4810 Entry Ahead | U         | B          |             | 1          | 27              | -               | 495                                                     | 1940              | 1086                                                                            | 45.6%       | -                     | -                            | -                           | 1.3                 | 9.5                       | 4.4                  |
| 4/2      | A4810 Entry Ahead | U         | B          |             | 1          | 27              | -               | 648                                                     | 1940              | 1086                                                                            | 78.1%       | -                     | -                            | -                           | 3.8                 | 16.0                      | 10.9                 |
| 15/1     | Circulatory Right | U         | A          |             | 1          | 9               | -               | 155                                                     | 1940              | 388                                                                             | 39.9%       | -                     | -                            | -                           | 1.1                 | 25.1                      | 2.2                  |
| 15/2     | Circulatory Right | U         | A          |             | 1          | 9               | -               | 285                                                     | 1940              | 388                                                                             | 73.5%       | -                     | -                            | -                           | 2.8                 | 35.8                      | 5.0                  |
| C1       |                   |           |            |             |            |                 |                 | PRC for Signalled Lanes (%):<br>PRC Over All Lanes (%): | 15.3<br>15.3      | Total Delay for Signalled Lanes (pcuHr):<br>Total Delay Over All Lanes (pcuHr): |             |                       | 9.01<br>10.44                | Cycle Time (s): 50          |                     |                           |                      |

## Basic Results Summary

**Scenario 10: 'Existing PM +25% U turners'** (FG10: 'Thur 5 June 2025 PM +25%BB', Plan 1: 'Network Control Plan 1')

## Network Layout Diagram



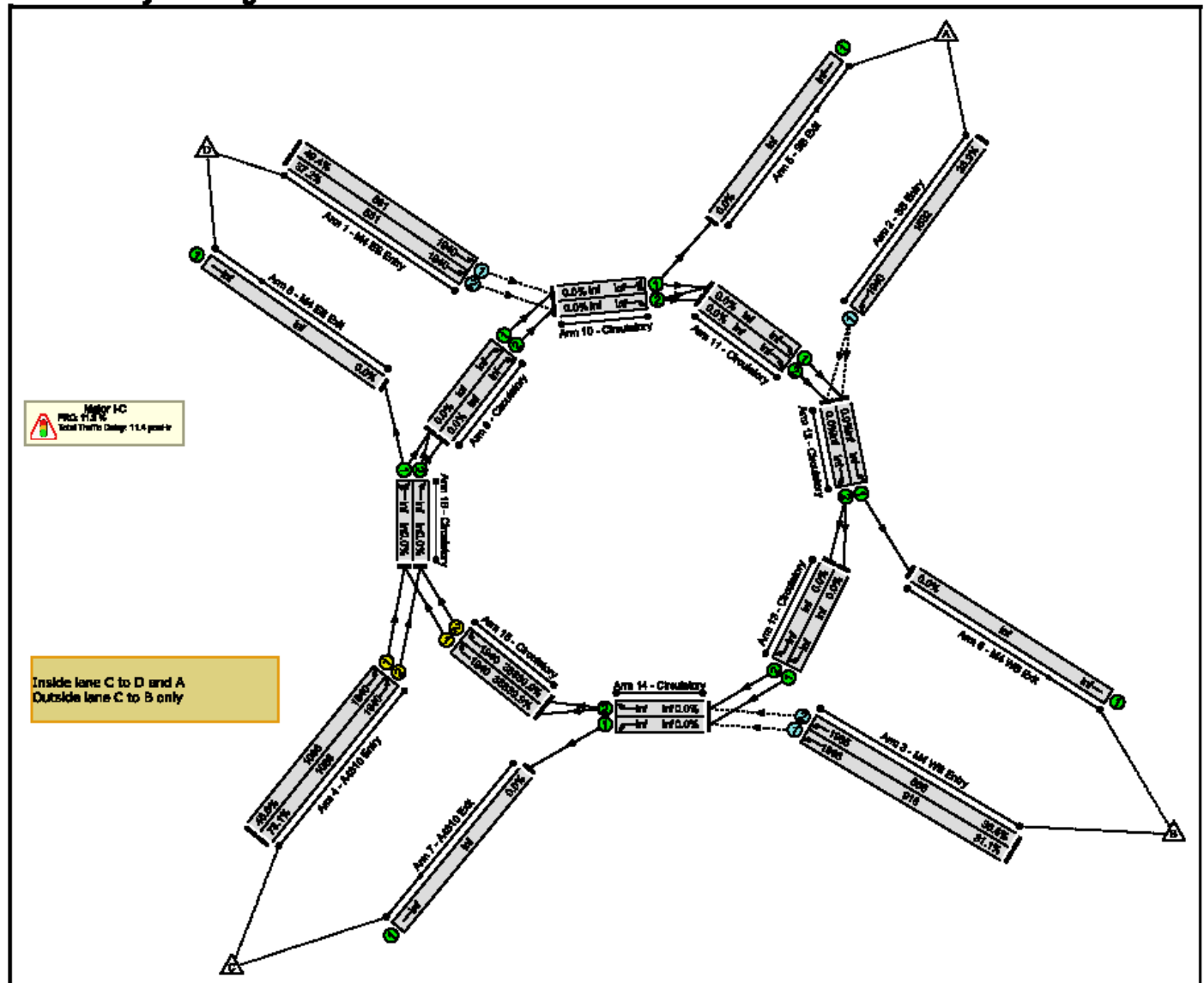
# Basic Results Summary

## 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  | -                 | -         | -          |             | -          | -               | -               | -                                                       | -                 | -                                                                               | 77.5%       | 1848                  | 0                            | 0                           | 7.8                 | -                         | -                    |
| Major LC | -                 | -         | -          |             | -          | -               | -               | -                                                       | -                 | -                                                                               | 77.5%       | 1848                  | 0                            | 0                           | 7.8                 | -                         | -                    |
| 1/1      | M4 EB Entry Ahead | O         | -          |             | -          | -               | -               | 161                                                     | 1940              | 757                                                                             | 21.3%       | 161                   | 0                            | 0                           | 0.1                 | 3.0                       | 0.1                  |
| 1/2      | M4 EB Entry Ahead | O         | -          |             | -          | -               | -               | 332                                                     | 1940              | 757                                                                             | 43.9%       | 332                   | 0                            | 0                           | 0.4                 | 4.2                       | 0.4                  |
| 2/1      | SB Entry Left     | O         | -          |             | -          | -               | -               | 369                                                     | 1940              | 1779                                                                            | 20.7%       | 369                   | 0                            | 0                           | 0.1                 | 1.3                       | 0.1                  |
| 3/1      | M4 WB Entry Ahead | O         | -          |             | -          | -               | -               | 677                                                     | 1965              | 874                                                                             | 77.5%       | 677                   | 0                            | 0                           | 1.7                 | 8.0                       | 1.7                  |
| 3/2      | M4 WB Entry Ahead | O         | -          |             | -          | -               | -               | 307                                                     | 1965              | 824                                                                             | 37.3%       | 307                   | 0                            | 0                           | 0.3                 | 3.5                       | 0.3                  |
| 4/1      | A4810 Entry Ahead | U         | B          |             | 1          | 22              | -               | 327                                                     | 1940              | 892                                                                             | 36.6%       | -                     | -                            | -                           | 1.1                 | 12.0                      | 3.2                  |
| 4/2      | A4810 Entry Ahead | U         | B          |             | 1          | 22              | -               | 384                                                     | 1940              | 892                                                                             | 43.0%       | -                     | -                            | -                           | 1.3                 | 12.6                      | 3.9                  |
| 15/1     | Circulatory Right | U         | A          |             | 1          | 14              | -               | 154                                                     | 1940              | 582                                                                             | 26.5%       | -                     | -                            | -                           | 0.7                 | 17.5                      | 1.8                  |
| 15/2     | Circulatory Right | U         | A          |             | 1          | 14              | -               | 305                                                     | 1940              | 582                                                                             | 52.4%       | -                     | -                            | -                           | 1.8                 | 21.0                      | 4.0                  |
| C1       |                   |           |            |             |            |                 |                 | PRC for Signalled Lanes (%):<br>PRC Over All Lanes (%): | 71.7<br>16.2      | Total Delay for Signalled Lanes (pcuHr):<br>Total Delay Over All Lanes (pcuHr): |             |                       | 4.98<br>7.61                 | Cycle Time (s): 50          |                     |                           |                      |

**Scenario 11: 'Existing AM +50% U turners' (FG11: 'Thur 5 June 2025 AM +50%BB', Plan 1: 'Network Control Plan 1')**

### Network Layout Diagram



# Basic Results Summary

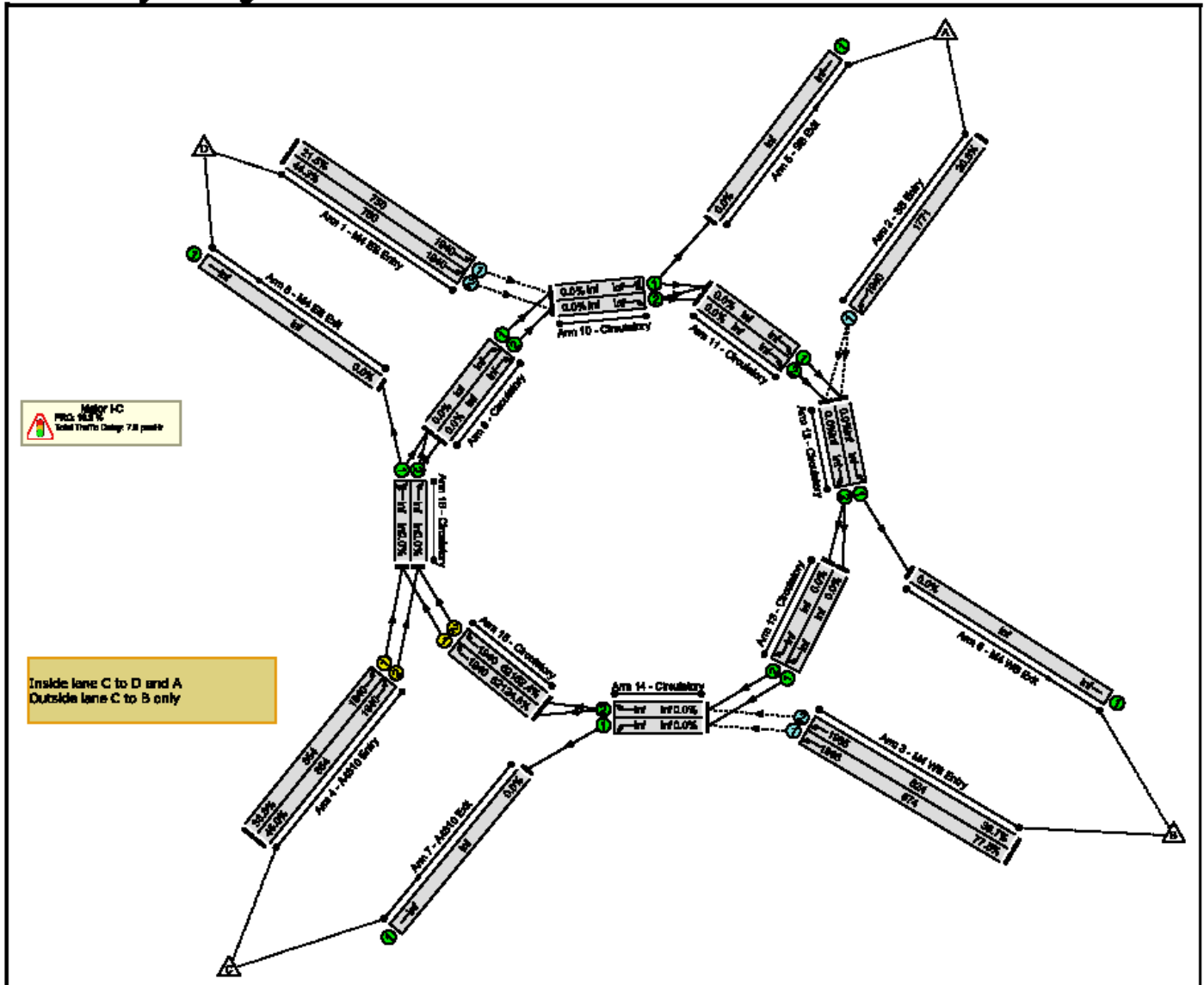
## Network Results

| 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  | -                 | -         | -          |             | -          | -               | -               | -                                                       | -                 | -                                                                               | 80.9%       | 1548                  | 0                            | 0                           | 11.4                | -                         | -                    |
| Major LC | -                 | -         | -          |             | -          | -               | -               | -                                                       | -                 | -                                                                               | 80.9%       | 1548                  | 0                            | 0                           | 11.4                | -                         | -                    |
| 1/1      | M4 EB Entry Ahead | O         | -          |             | -          | -               | -               | 287                                                     | 1940              | 581                                                                             | 49.4%       | 287                   | 0                            | 0                           | 0.5                 | 6.1                       | 0.5                  |
| 1/2      | M4 EB Entry Ahead | O         | -          |             | -          | -               | -               | 216                                                     | 1940              | 581                                                                             | 37.2%       | 216                   | 0                            | 0                           | 0.3                 | 4.9                       | 0.3                  |
| 2/1      | SB Entry Left     | O         | -          |             | -          | -               | -               | 443                                                     | 1940              | 1532                                                                            | 28.9%       | 443                   | 0                            | 0                           | 0.2                 | 1.7                       | 0.2                  |
| 3/1      | M4 WB Entry Ahead | O         | -          |             | -          | -               | -               | 285                                                     | 1965              | 916                                                                             | 31.1%       | 285                   | 0                            | 0                           | 0.2                 | 2.8                       | 0.2                  |
| 3/2      | M4 WB Entry Ahead | O         | -          |             | -          | -               | -               | 317                                                     | 1965              | 866                                                                             | 36.8%       | 317                   | 0                            | 0                           | 0.3                 | 3.3                       | 0.3                  |
| 4/1      | A4810 Entry Ahead | U         | B          |             | 1          | 27              | -               | 495                                                     | 1940              | 1086                                                                            | 45.6%       | -                     | -                            | -                           | 1.3                 | 9.5                       | 4.4                  |
| 4/2      | A4810 Entry Ahead | U         | B          |             | 1          | 27              | -               | 848                                                     | 1940              | 1086                                                                            | 78.1%       | -                     | -                            | -                           | 3.8                 | 16.0                      | 10.9                 |
| 15/1     | Circulatory Right | U         | A          |             | 1          | 9               | -               | 155                                                     | 1940              | 388                                                                             | 39.9%       | -                     | -                            | -                           | 1.1                 | 25.1                      | 2.2                  |
| 15/2     | Circulatory Right | U         | A          |             | 1          | 9               | -               | 314                                                     | 1940              | 388                                                                             | 80.9%       | -                     | -                            | -                           | 3.7                 | 42.2                      | 6.1                  |
| C1       |                   |           |            |             |            |                 |                 | PRC for Signalled Lanes (%):<br>PRC Over All Lanes (%): | 11.2<br>11.2      | Total Delay for Signalled Lanes (pcuHr):<br>Total Delay Over All Lanes (pcuHr): |             |                       | 9.85<br>11.36                | Cycle Time (s): 50          |                     |                           |                      |

## Basic Results Summary

**Scenario 12: 'Existing PM +50% U turners' (FG12: 'Thur 5 June 2025 PM +50%BB', Plan 1: 'Network Control Plan 1')**

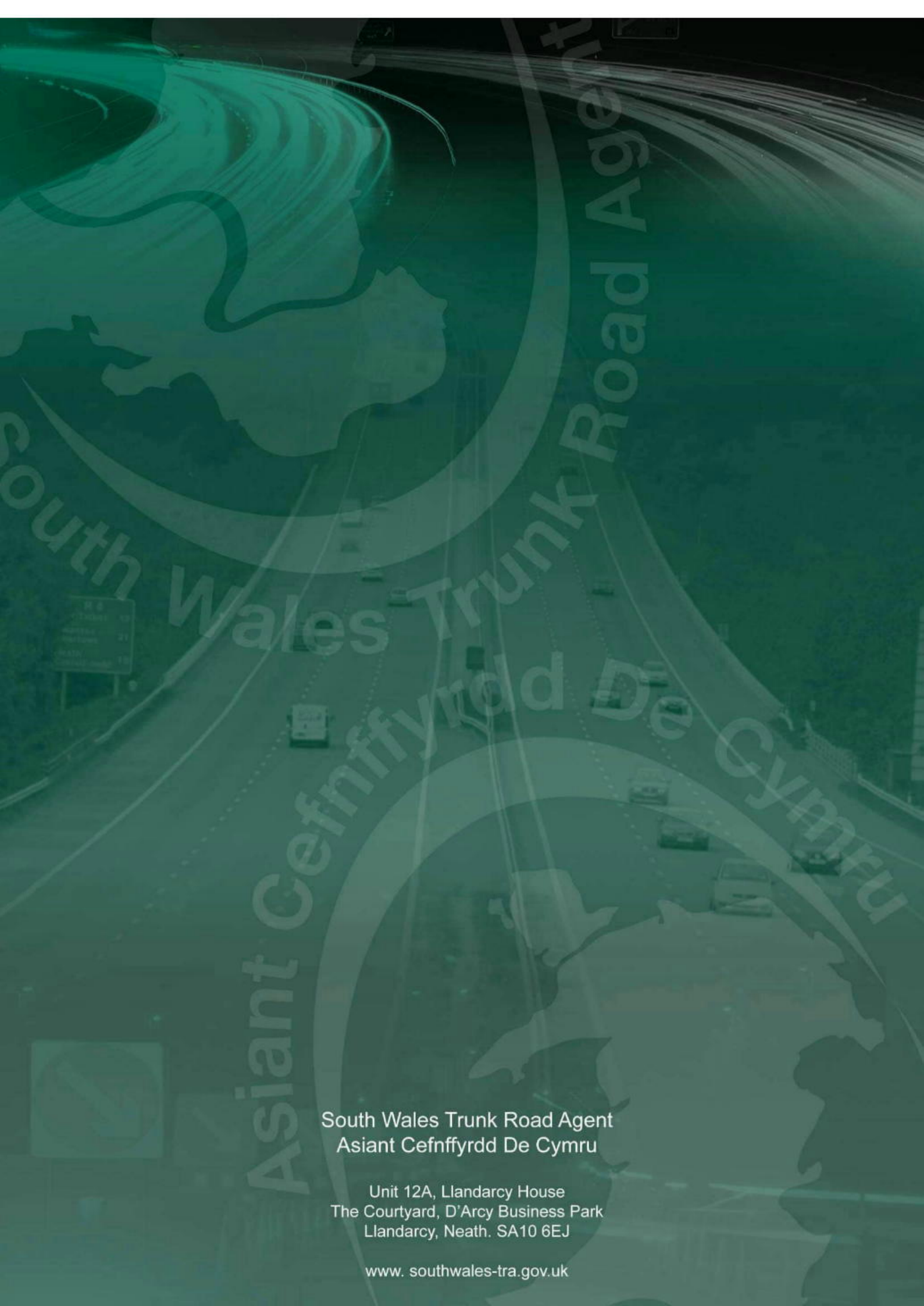
## Network Layout Diagram



# 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  | -                 | -         | -          |             | -          | -               | -               | -                                                       | -                 | -                                                                               | 77.5%       | 1868                  | 0                            | 0                           | 7.8                 | -                         | -                    |
| Major LC | -                 | -         | -          |             | -          | -               | -               | -                                                       | -                 | -                                                                               | 77.5%       | 1868                  | 0                            | 0                           | 7.8                 | -                         | -                    |
| 1/1      | M4 EB Entry Ahead | O         | -          |             | -          | -               | -               | 161                                                     | 1940              | 750                                                                             | 21.5%       | 161                   | 0                            | 0                           | 0.1                 | 3.1                       | 0.1                  |
| 1/2      | M4 EB Entry Ahead | O         | -          |             | -          | -               | -               | 332                                                     | 1940              | 750                                                                             | 44.3%       | 332                   | 0                            | 0                           | 0.4                 | 4.3                       | 0.4                  |
| 2/1      | SB Entry Left     | O         | -          |             | -          | -               | -               | 369                                                     | 1940              | 1771                                                                            | 20.8%       | 369                   | 0                            | 0                           | 0.1                 | 1.3                       | 0.1                  |
| 3/1      | M4 WB Entry Ahead | O         | -          |             | -          | -               | -               | 677                                                     | 1965              | 874                                                                             | 77.5%       | 677                   | 0                            | 0                           | 1.7                 | 8.0                       | 1.7                  |
| 3/2      | M4 WB Entry Ahead | O         | -          |             | -          | -               | -               | 327                                                     | 1965              | 824                                                                             | 39.7%       | 327                   | 0                            | 0                           | 0.3                 | 3.8                       | 0.3                  |
| 4/1      | A4810 Entry Ahead | U         | B          |             | 1          | 21              | -               | 327                                                     | 1940              | 854                                                                             | 38.3%       | -                     | -                            | -                           | 1.2                 | 12.9                      | 3.3                  |
| 4/2      | A4810 Entry Ahead | U         | B          |             | 1          | 21              | -               | 384                                                     | 1940              | 854                                                                             | 45.0%       | -                     | -                            | -                           | 1.5                 | 13.6                      | 4.0                  |
| 15/1     | Circulatory Right | U         | A          |             | 1          | 15              | -               | 154                                                     | 1940              | 621                                                                             | 24.8%       | -                     | -                            | -                           | 0.7                 | 16.4                      | 1.7                  |
| 15/2     | Circulatory Right | U         | A          |             | 1          | 15              | -               | 325                                                     | 1940              | 621                                                                             | 52.4%       | -                     | -                            | -                           | 1.8                 | 20.0                      | 4.2                  |
| C1       |                   |           |            |             |            |                 |                 | PRC for Signalled Lanes (%):<br>PRC Over All Lanes (%): | 71.9<br>16.2      | Total Delay for Signalled Lanes (pcuHr):<br>Total Delay Over All Lanes (pcuHr): |             |                       | 5.12<br>7.80                 | Cycle Time (s): 50          |                     |                           |                      |



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