Isle of Wight Council

Isle of Wight Junction Assessment and Design

Junction Feasibility Study

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Limitations

Contents

Tables

Figures

Appendices

1 Introduction

General

1.1 WYG have been appointed by the Isle of Wight (IOW) Council to undertake a feasibility study for a series of highway junctions located throughout the island, with a particular focus on the towns of Newport, Ryde, Shanklin and Sandown. The study has been carried out to identify traffic management issues impacting on all road users and develop proposals that will form part of a package of schemes to be progressed as part of the Council's Local Implementation Plan (LIP) process.

1.2 IOW Council has identified 15 highway junctions which currently experience traffic issues such as congestion and queuing. The study considers where the main issues lie in relation to traffic movement, road safety, bus operation, pedestrian and cycle provision, public realm, parking provision and servicing. Each of the 15 highway junctions are to be supplemented by a feasibility study report, with traffic modelling software used to test the various proposals in order to identify a range of measures aimed at improving the behaviour and movement of traffic at each junction.

1.3 The 15 key junctions identified are summarised in **Table 1.1** below:

Table 1.1 List of Junctions

ID Num	Junction Name	Area	Junction Type
1	St Mary's Roundabout	Newport	4 arm Roundabout
2	Coppins Bridge Gyratory	Newport	Gyratory
3	Hunnyhill/Hunnycross Way	Newport	Signalised Crossroads
4	Hunnycross Way/Riverway	Newport	3x Roundabouts
5	Medina Way/Coppins Bridge Roundabout	Newport	Gyratory
6	Queens Road/West Street	Ryde	5 arm Signalised Jct
7	Argyll St/West St	Ryde	Signalised Crossroads
8	Binstead Road/Pellhurst Road	Ryde	3 arm Signalised Jct
9	Quarr Hill/Newnham Road	Ryde	4 arm Roundabout
10	Marlborough Road/Great Preston Road	Ryde	Signalised Crossroads
11	High Street/Victoria Avenue, Shanklin	Shanklin	3 arm Signalised Jct
12	Newport Road/Industrial Way	Shanklin	4 arm Roundabout
13	Newport Road/Sandown Road	Shanklin	3 arm Signalised Jct
14	Lake Hill/The Fairway	Shanklin	Triangular 3x Priority Jcts
15	Morton Common/Perowne Way	Sandown	3 arm Signalised Jct

Site Location & Background

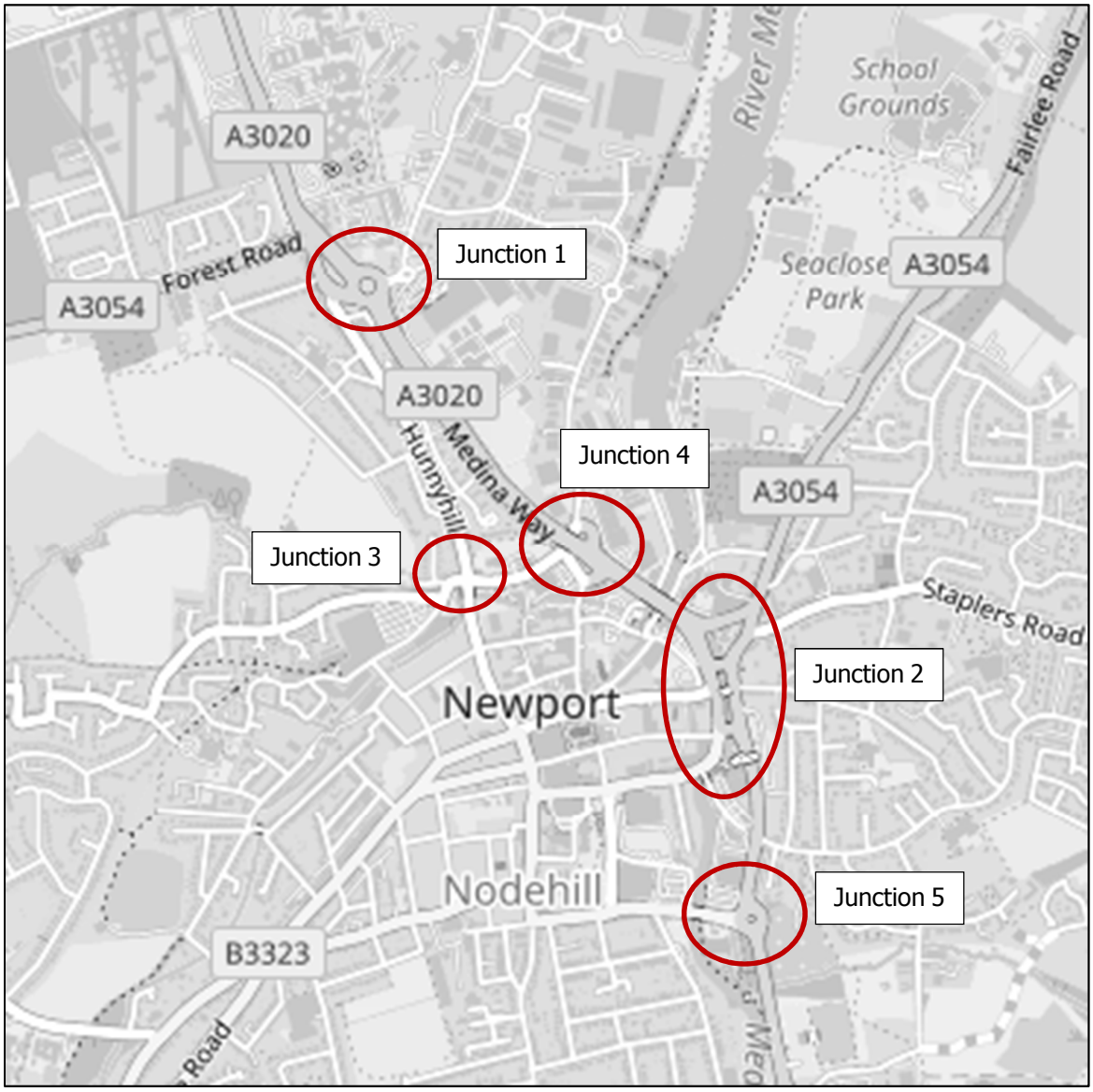
1.4 The Isle of Wight is an island located in the English Channel, approximately 6km off the Hampshire coast. The towns of Newport, Ryde, Shanklin and Sandown comprise the project study area for this feasibility study.

1.5 The town of Newport is the largest town on the IOW and is located in the centre of the island, the town of Ryde is located approximately 10km to the east of Newport, on the north-eastern coast of the island whilst Shanklin and Sandown are located approximately 9km to the south of Ryde and 10km to the south east of Newport.

1.6 The IOW as a whole is characterised by high car ownership levels, with 77.5% of households on the island owning a car or van, as indicated by the 2011 Census. Thus, the private vehicle remains the most convenient and fastest way to travel around the island.

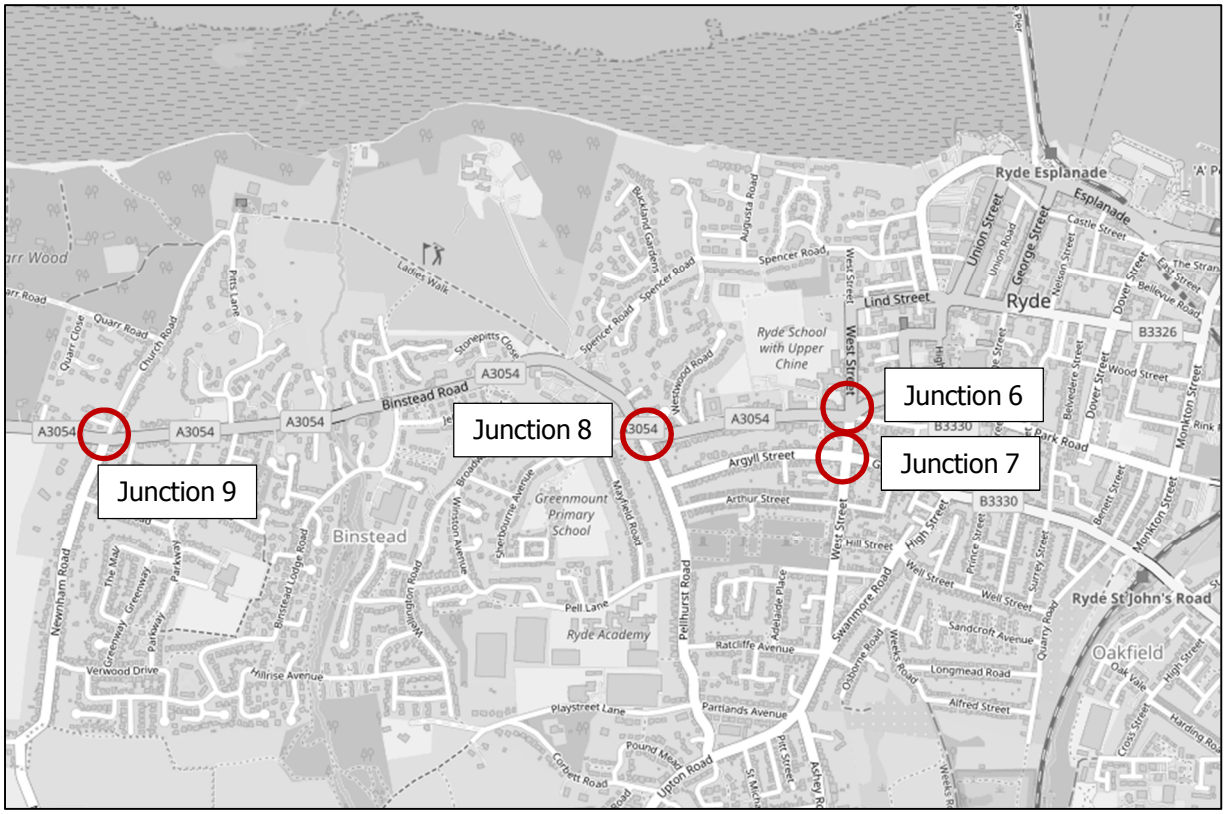
1.7 **Figures 1.1 – 1.3** presents the locations of all 15 junctions within Newport, Ryde and Shanklin & Sandown, which comprise the feasibility study area.

Figure 1.1 Feasibility Study Area – Newport Junctions



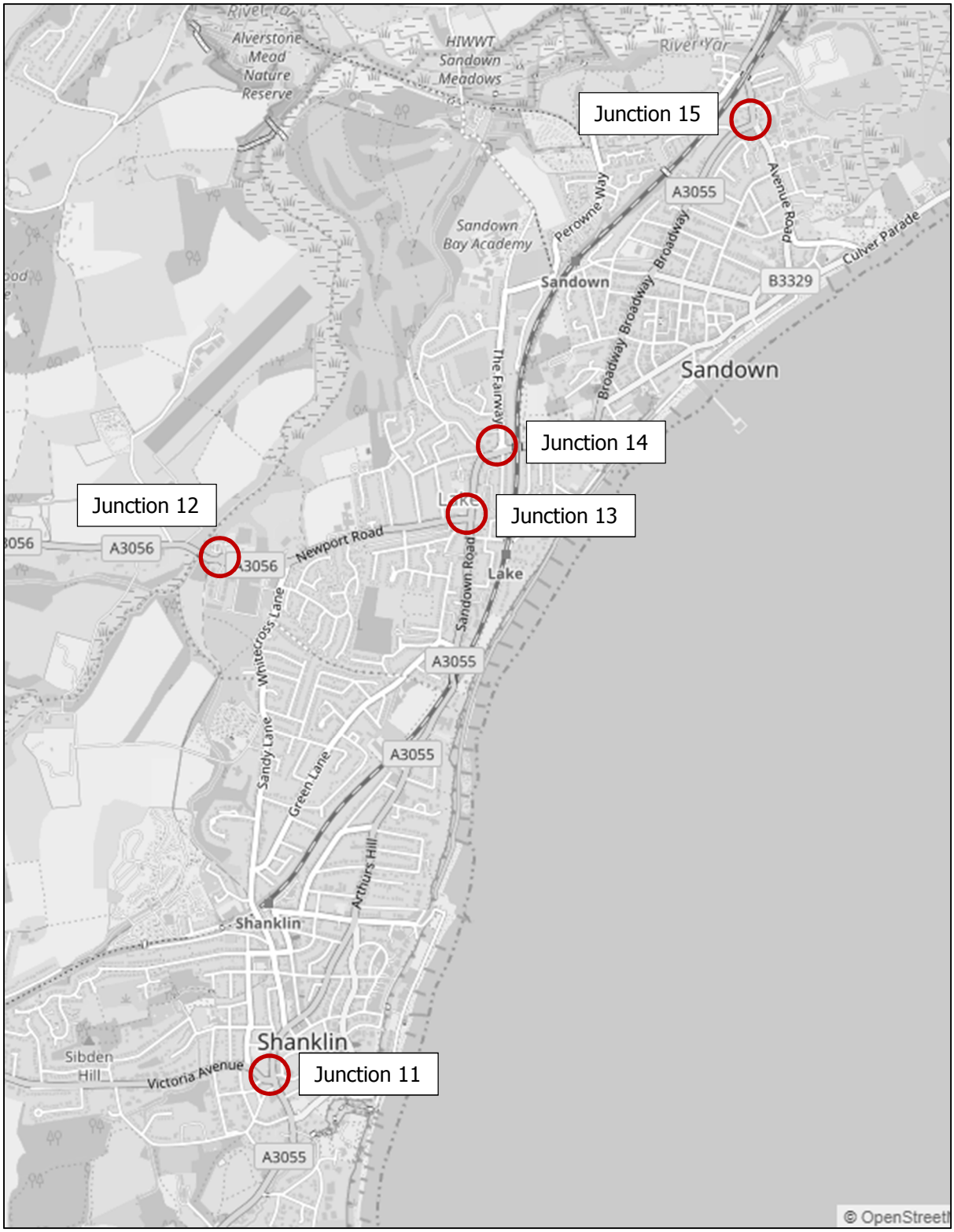
Source: OpenStreetMap with WYG Annotations, September 2017

Figure 1.2 Feasibility Study Area – Ryde Junctions



Source: OpenStreetMap, September 2017

Figure 1.3 Feasibility Study Area – Sandown & Shanklin Junctions

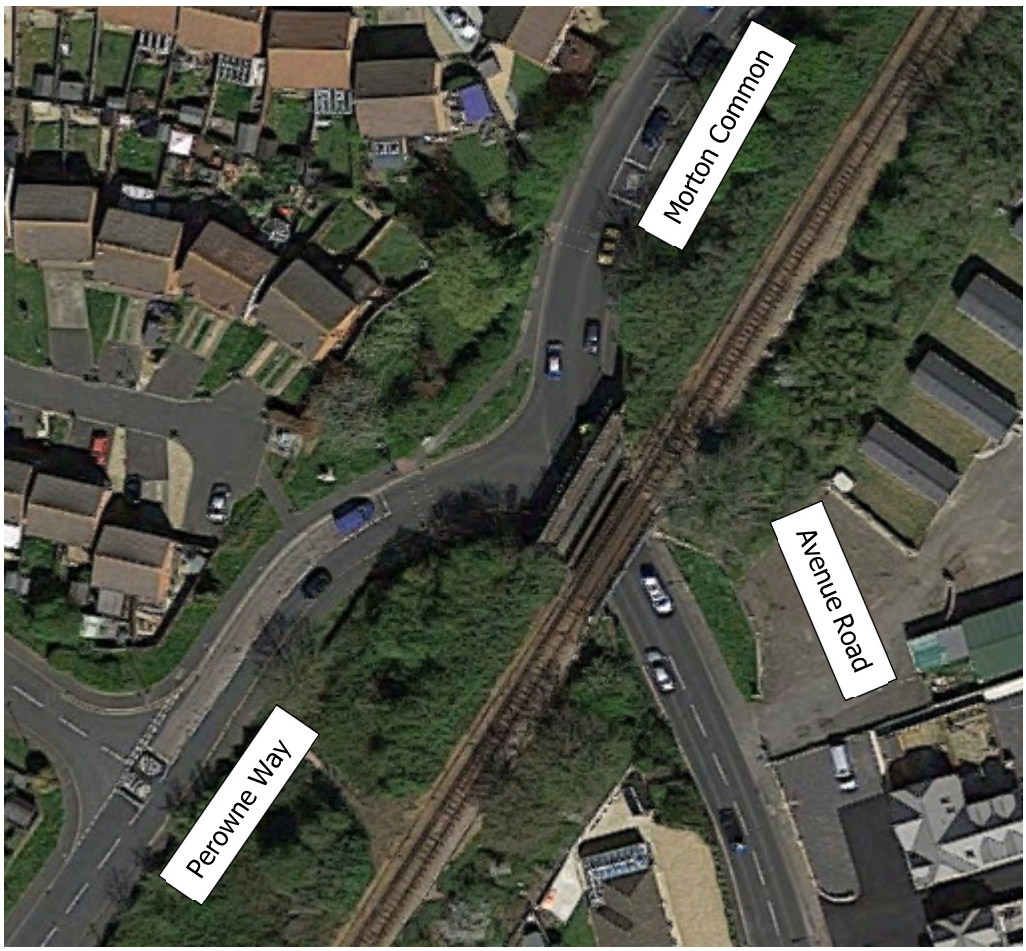


Source: OpenStreetMap, September 2017

1.8 Each of the 15 junctions are to be addressed within an individual feasibility study report. This report focuses on Junction 15, the highway junction of Perowne Way, Morton Common and Avenue Road which is a signalised junction in Ryde.

1.9 **Figure 1.4** presents a site location plan of the junction.

Figure 1.4 Junction Location Plan



Source: Google Satellite Image, August 2017

Scope/Purpose of Study

1.10 The purpose of the study is to identify, through the use of traffic modelling software, where the main issues lie in terms of capacity, congestion and queuing at the junction; the traffic modelling will inform the type of highway improvements and design required at each junction.

Report Structure

1.11 The remainder of this document is structured as follows:

- **Chapter 2: Existing Conditions** - summarising the existing conditions at the junction, providing background to the junction, local highway network and detailing the current traffic issues experienced at the junction;
- **Chapter 3: Modelling Methodology** - setting-out details of tasks undertaken to build traffic models of the study area using specialist software, including results of option testing for the junction of interest;
- **Chapter 4: Preferred Scheme** - detailing the preferred scheme for highway improvements at the junction and their expected outcome; and
- **Chapter 5: Summary and Conclusions** - summarising the feasibility study process and outlining the key findings of the assessment.

1.12 All Appendices are included at the end of this report for information.

2 Existing Conditions

General

2.1 This chapter establishes the existing, or 'baseline', highway conditions which prevail in the area surrounding the junction. It describes the existing local highway network and any traffic issues present at the junction.

2.2 Baseline studies have been informed by detailed site visits and desk-based research carried out between August and September 2017.

2.3 This report focuses on the 'T' junction at Perowne Way / Morton Common and Avenue Road in Sandown.

Data Collection

2.4 Traffic flow surveys were undertaken by MHC Traffic Ltd on Thursday 20th July 2017 to establish the baseline traffic conditions for the local highway network on the IOW. A range of surveys were undertaken including:

- Manual Classified Counts (MCC) for turning flow information at 15 key junctions on the IOW;
- Automatic Traffic Counts (ATCs) were placed at strategic locations on the network allowing the speeds to be obtained at each of these junctions;
- Queue length surveys at stop lines of all 15 junctions; and
- Video traffic surveys at each of the 15 junctions.

2.5 The surveys allowed for the identification of turning movements at all key junctions as well as routing within the IOW. Signal timing data was additionally supplied by the IOW Council for use for the correct modelling of signal timing data.

2.6 The data collected as part of the surveys was used directly for calibrating and validating the base scenario for both the Junctions 9 and LinSig models. Video footage of the surveyed junctions was additionally reviewed to ensure that the base models reflect the on-street road conditions as closely as possible.

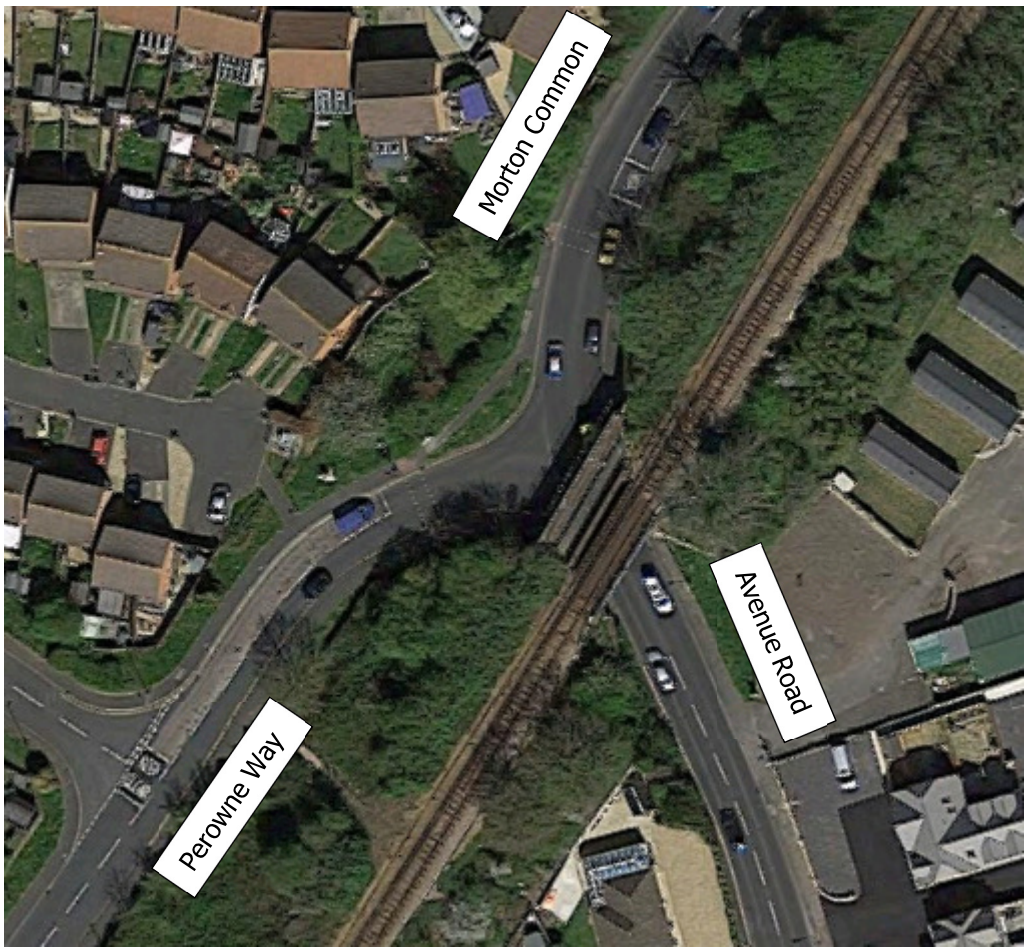
Study Area/Junction Background

2.7 The 'T' junction at Perowne Way / Morton Common and Avenue Road is located approximately 1 km to the east of Sandown Rail station, it is situated on the northern edge of Sandown. Perowne Way forms the western arm, Morton Common forms the eastern arm and Avenue Road forms the southern arm.

2.8 The A3055 – Avenue Road forms the main route which leads down to the Esplanade. Perowne Way provides access to a number of residential side streets as well as access to the Fairway Holiday Park and also provides access to Sandown Rail station.

2.9 A location plan of the junction is provided in **Figure 2.1**.

Figure 2.1 Junction Location Plan

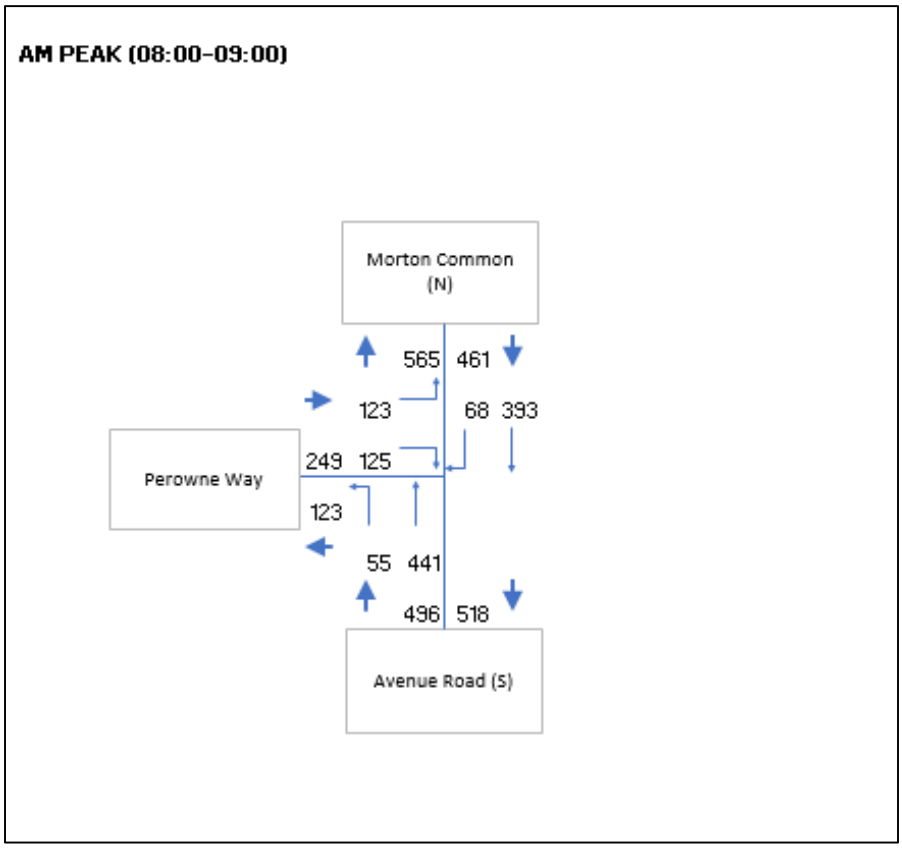


Source: Google Image, August 2017

Base Traffic Flows

2.10 This section details the current traffic flows and queuing at the junction, as indicated by the survey data. These are shown in **Figures 2.2** and **2.3**.

Figure 2.2 AM Traffic Flows (PCUs)

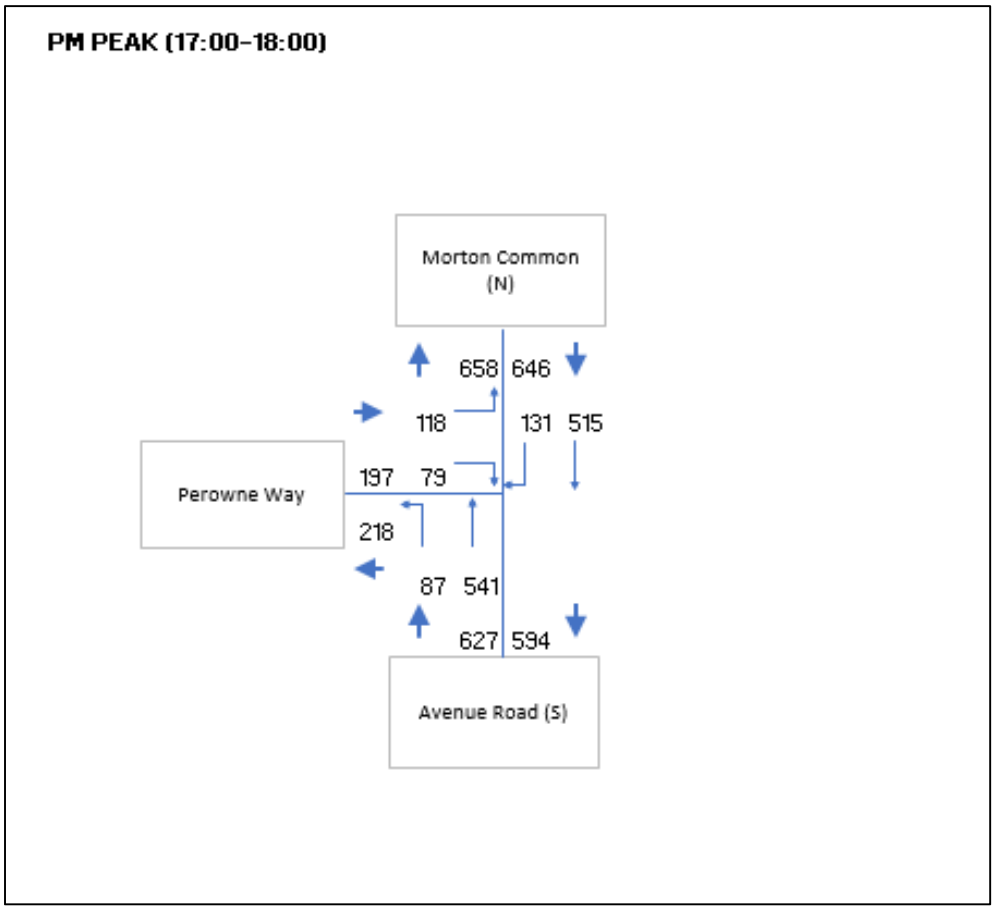


2.11 As shown in Figure 2.2, the highest traffic flows are those travelling northbound along Morton Common/Avenue Road in the AM peak (08:00-09:00), with 441 PCUs undertaking this movement. Southbound flows are also particularly high, with 393 PCUs recorded. Morton Common and Avenue Road form part of the A3055 which is the main traffic route between Shanklin, Sandown and Ryde. There are also a fairly high number of left-turners and right-turners from Morton Common/Avenue Road to Perowne Way, with 68 PCUs recorded from Morton Common and 55 recorded from Avenue Road.

2.12 In terms of queues, the majority of queueing occurs on Morton Common and Avenue Road. The maximum observed queues recorded on Morton Common and Avenue Road were 12 vehicles, whilst some queueing occurs on Perowne Way, with a maximum observed queue of 10 vehicles.

2.13 **Figure 2.3** below shows the traffic flows for the PM peak (17:00-18:00).

Figure 2.3 PM Traffic Flows (PCUs)



2.14 As shown in Figure 2.3, the highest traffic flows are those travelling northbound along Morton Common/Avenue in the PM peak (17:00-18:00), with 541 PCUs undertaking this movement. Southbound flows are also particularly high, with 515 PCUs recorded. Left-turners and right-turners from Morton Common/Avenue Road to Perowne Way are also fairly high, with 87 and 131 PCUs recorded.

2.15 In terms of queues, the majority of queuing occurs on Morton Common and Avenue Road. The maximum observed queue recorded on Morton Common was 18 vehicles, whilst on Avenue Road this was recorded at 14 vehicles. Some queuing occurs on Perowne Way, with a maximum observed queue of seven vehicles.

Existing Traffic Issues

2.16 At present, the junction is known to experience some queuing, which has been informed by a site visit and traffic surveys at the junction. It was observed that congestion and queuing are particularly evident on Morton Common and Avenue Road (A3055).

A3055 Morton Common

2.17 The A3055 Morton Common forms the northern arm of the signalised junction. On this arm, there are a high number of vehicles turning right from Morton Common to Perowne Way, during both the AM and PM peaks. The right-turners give way to northbound traffic, whilst waiting for a gap in traffic, as a result this blocks southbound traffic (from Morton Common to Avenue Road) causing queuing and congestion.

A3055 Avenue Road

2.18 The A3055 Avenue Road forms the southern arm of the signalised junction. On this arm, northbound flows (Avenue Road to Morton Common) are particularly high, which results in congestion and queuing.

Collisions

2.19 A collision data review for the most recent five years was undertaken at the junction, using the website crashmap.co.uk. It was found that four 'slight' collisions were recorded in the vicinity of the junction during this time period. This is considered to be typical for a junction of this nature, and it is therefore concluded that there are no road safety issues in relation to the highway junction.

Local Highway Network

A3055 Morton Common

2.20 The A3055 Morton Common is a two-way single carriageway road with footways either side of the carriageway and has a pedestrian puffin crossing positioned at the signalised junction. A cycle lane is provided on the eastern side of the carriageway on the approach to the junction and is approximately 60m in length, this is accompanied by an advanced stop line for cycles provided at the junction. The road is subject to a 30mph speed restriction in the vicinity of the junction and forms the main traffic route between Shanklin, Sandown and Ryde.

2.21 The bridge across the junction has a height restriction of 14ft 3in (approximately 4.3m); high vehicles are required to use Perowne Way as an alternative route travelling southbound.

A3055 Avenue Road

2.22 The A3055 Avenue Road is a two-way single carriageway road with a footway provided on its eastern side. It is subject to a 30mph speed restriction along its length and forms a main route into Sandown and Shanklin.

Perowne Way

2.23 Perowne Way is a two-way single carriageway road with footways either side of the carriageway. The road is predominately residential and provides access to Sandown Bay Academy. Perowne Way provides access to The Fairway which can be used as a shortcut and an alternative to the A3055 (The Broadway). The road is subject to a 30mph speed restriction along its entire length.

Utilities Assessment

2.24 A utilities assessment has been carried out at the junction as an indication of which utilities are present within the vicinity of the junction. The following utilities which may be affected by improvements at the junction are listed below:

- Environment Agency
- GTC
- Isle of Wight Council
- LinesearchbeforeUdig
- Network Rail
- Openreach – (British Telecommunications)
- Scottish and Southern Electricity
- SGN – Southern Gas Networks
- Southern Water

3 Modelling Methodology

Introduction

3.1 Traffic modelling has been undertaken as part of the feasibility study, identifying how the local highway network on the Isle of Wight currently operates and how it might operate following the proposed improvements to the identified junctions. A range of traffic modelling has been undertaken using the traffic modelling software Junctions 9 or LinSig v3 depending on the junction type. Junctions 9 is the latest version of TRL's industry-standard software for modelling roundabouts and priority junctions, whilst LinSig v3 is the latest version of JCT's industry-standard software for modelling signalised junctions and urban road networks.

3.2 Within the junctions identified, there are a number of priority, roundabouts, gyratories and signalised junctions. The traffic signal modelling software was used to model the three-arm signalised junction, as part of this report. The modelling has been undertaken for two weekday periods considered to be the network peaks in terms of traffic volumes, with the AM peak between 08:00 and 09:00 and the PM peak between 17:00 and 18:00. These peaks were identified through analysis of traffic count data. Initially, Base Year modelling was using survey data collected in July 2017. Future Year modelling was subsequently carried out in order to test the proposed changes to the network and assess the scale of impact on road traffic.

Explanation of Results

3.3 Queue lengths at junction approaches are usually expressed in terms of 'Passenger Car Equivalent' (PCE) or 'Passenger Car Unit' (PCU). A standard car typically has a PCE/PCU value of 1.0; larger vehicles, such as goods vehicles, typically have PCE/PCU values greater than 1.0 and smaller vehicles, such as motorcycles, typically have PCE/PCU values less than 1.0.

3.4 The Degree of Saturation (DoS) is a ratio of demand to capacity on each approach to a signalised junction, with a value of 100% meaning that demand and capacity are equal and no further traffic is able to progress through the junction. Values over 85% are typically regarded as suffering from traffic congestion, with queues of vehicles beginning to form. The term Practical Reserve Capacity (PRC) is often used to refer to the available spare capacity at a junction. A negative PRC indicates that the junction is over capacity.

3.5 It is noted that a DoS of 90% or over recorded on an approach to the junction is deemed as approaching capacity and therefore a DoS of under 90% is considered acceptable.

Base Year Modelling

3.6 Data was collected as part of the surveys was compared to the base year outputs to match modelled flows and queue patterns to those observed, within acceptable variations. The results for the A3055 Morton Common / Avenue Road / Perowne Way junctions are summarised in **Table 3.1**, with full output results included in **Appendix B**.

LinSig Model Results – 2017 Base Year

Table 3.1 2017 Base Year Assessment (60 seconds): Existing Junction

Arm Cycle time 60 secs	AM peak			PM peak		
	Deg Sat (%)	Mean Max Queue (pcu)	Av. Delay Per PCU (s/pcu)	Deg Sat (%)	Mean Max Queue (pcu)	Av. Delay Per PCU (s/pcu)
1/1 – Morton Common	65.1%	7.2	16.8	86.0%	12.2	27.2
2/1 – Avenue Road	65.3%	7.5	21.4	68.7%	9.1	18.2
3/1 – Perowne Way	62.9%	4.5	32.8	77.9%	4.8	54.9
PRC	37.8%			4.6%		
Total Delay (pcu/hr)	7.36			11.07		

3.7 The base year results as shown in Table 3.1, indicate that the junction operates within recommended capacity during the AM and PM peaks. In the AM peak, a PRC of 37.8% is recorded at the junction and in the PM peak, the PRC is recorded as 4.6%. Modelled queues of 7.2 and 12.2 PCUs are recorded on the Morton Common arm in the AM and PM peaks, whilst queues of 7.5 and 9.1 PCUs are recorded on Avenue Road. These modelled queues have been calibrated against the observed queues.

3.8 It is shown in the PM peak that the Morton Common and Perowne Way arms are approaching capacity, with a DoS of 86% and 77.9% recorded respectively. For comparison, the existing junction has been modelled as part of the 2034 Future Year scenario to determine how the junction would operate without any physical alterations, however, instead improving the junction by increasing the cycle time. The results for a 60, 90 second cycle and a 120 cycle time are shown in **Tables 3.2**, **3.3** and **3.4** below.

LinSig Model Results – 2034 Future Year

Table 3.2 2034 Year Assessment (60 seconds): Existing Junction

Arm Cycle time 60 secs	AM peak			PM peak		
	Deg Sat (%)	Mean Max Queue (pcu)	Av. Delay Per PCU (s/pcu)	Deg Sat (%)	Mean Max Queue (pcu)	Av. Delay Per PCU (s/pcu)
1/1 – Morton Common	87.3%	33.1	12.0	116.8%	75.0	300.6
2/1 – Avenue Road	76.6%	24.6	10.2	121.4%	85.1	367.6
3/1 – Perowne Way	83.0%	49.3	7.1	106.8%	16.7	220.1
PRC	3.1%			-34.8%		
Total Delay (pcu/hr)	13.49			158.50		

Table 3.3 2034 Year Assessment (90 seconds): Existing Junction

Arm Cycle time 90 secs	AM peak			PM peak		
	Deg Sat (%)	Mean Max Queue (pcu)	Av. Delay Per PCU (s/pcu)	Deg Sat (%)	Mean Max Queue (pcu)	Av. Delay Per PCU (s/pcu)
1/1 – Morton Common	75.1%	12.9	25.8	103.0%	40.4	115.9
2/1 – Avenue Road	61.1%	11.4	19.7	65.0%	13.0	15.1
3/1 – Perowne Way	77.0%	8.7	51.4	106.8%	19.0	237.0
PRC	16.8%			-18.6%		
Total Delay (pcu/hr)	11.71			44.35		

Table 3.4 2034 Year Assessment (120 seconds): Existing Junction

Arm Cycle time 120 secs	AM peak			PM peak		
	Deg Sat (%)	Mean Max Queue (pcu)	Av. Delay Per PCU (s/pcu)	Deg Sat (%)	Mean Max Queue (pcu)	Av. Delay Per PCU (s/pcu)
1/1 – Morton Common	72.4%	15.7	28.9	99.6%	38.6	83.9
2/1 – Avenue Road	56.3%	13.4	20.4	60.7%	15.0	14.8
3/1 – Perowne Way	71.9%	10.5	56.0	94.9%	13.0	128.0
PRC	24.2%			-10.7%		
Total Delay (pcu/hr)	12.69			30.02		

3.9 As shown in Table 3.3 and 3.4 above, by increasing the cycle time to 90 seconds and 120 seconds, there is an improvement in the PRC in both the AM and PM peaks, and a reduction in the DoS recorded on Morton Common and Perowne Way.

Proposed Schemes

3.10 Taking into account the Base Year modelling results, the main capacity issues experienced at the junction are found on the Morton Common and Perowne Way arms. As a result, two proposed schemes have been tested as part of the modelling, Options 1 and 2.

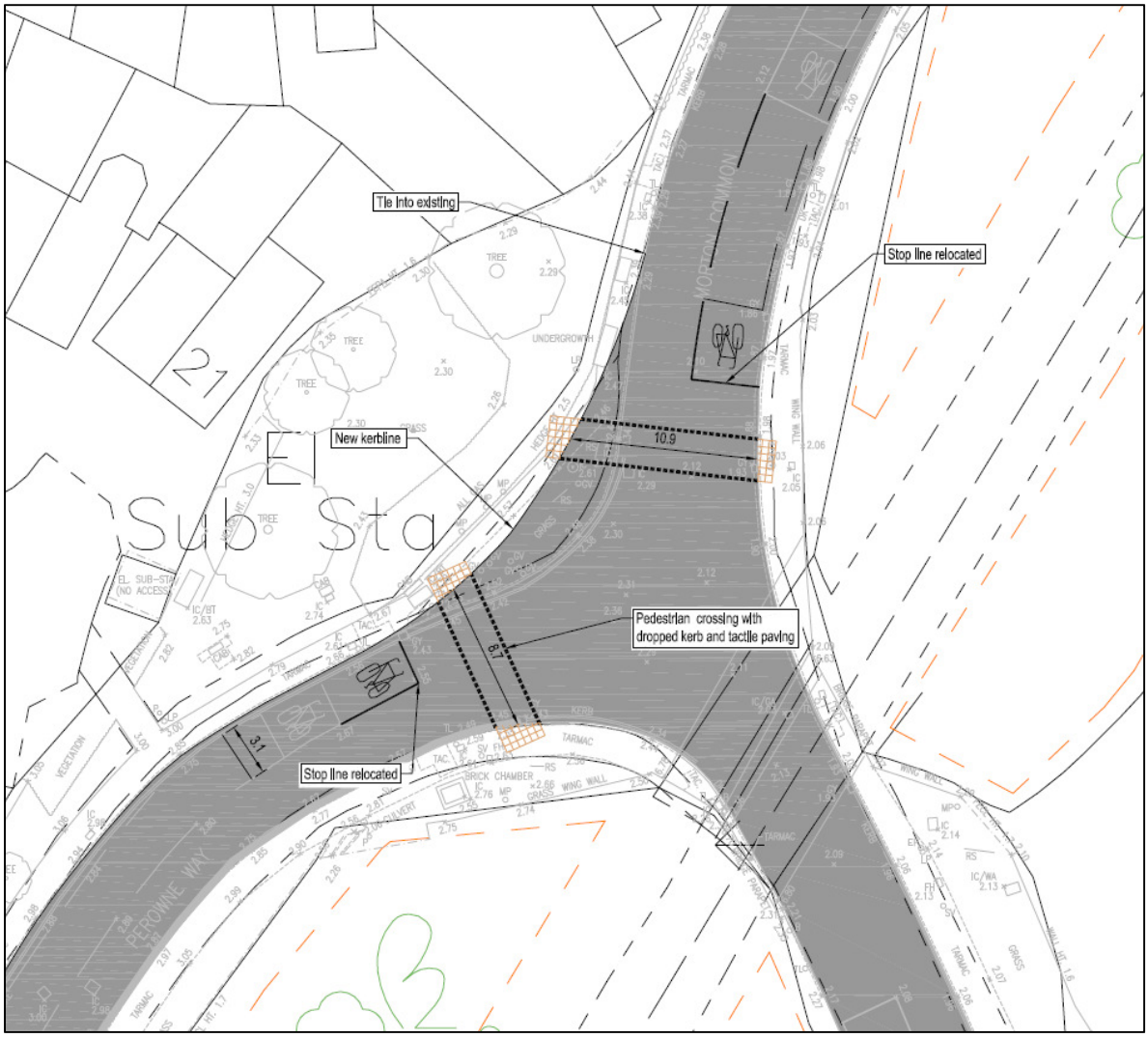
3.11 Option 1 includes the relocation of the stop lines and pedestrian crossings on Morton Common and Perowne Way, as well as realigning the kerbline between the two arms. The Avenue Road arm is to remain unchanged. The proposed changes are likely to reduce the intergreen period between the traffic phases and thus it is anticipated that the junction will operate more efficiently as a result.

3.12 Option 2 includes the widening of Perowne Way along the northwestern side of the junction, which allows for a right-turn storage lane to be placed in the centre of the junction, with storage for up to 1 PCU. As part of this design, staggered pedestrian crossings are to be implemented across each of the arms, whilst the stoplines on Morton Common and Avenue Road are to be moved forward. It is anticipated that the right-turn storage lane will make the junction more efficient as well as reduce queuing on the Morton Common arm.

3.13 At present, the junction has little signage and therefore it is proposed that signage, clear road markings and advisory information should be included as part of the design. It is anticipated that this will encourage correct lane discipline amongst drivers, on their approach to the junction. Signs and clear road markings directing drivers to nearby landmarks within Sandown and Shanklin is likely to improve the efficiency and flow of traffic through the junction.

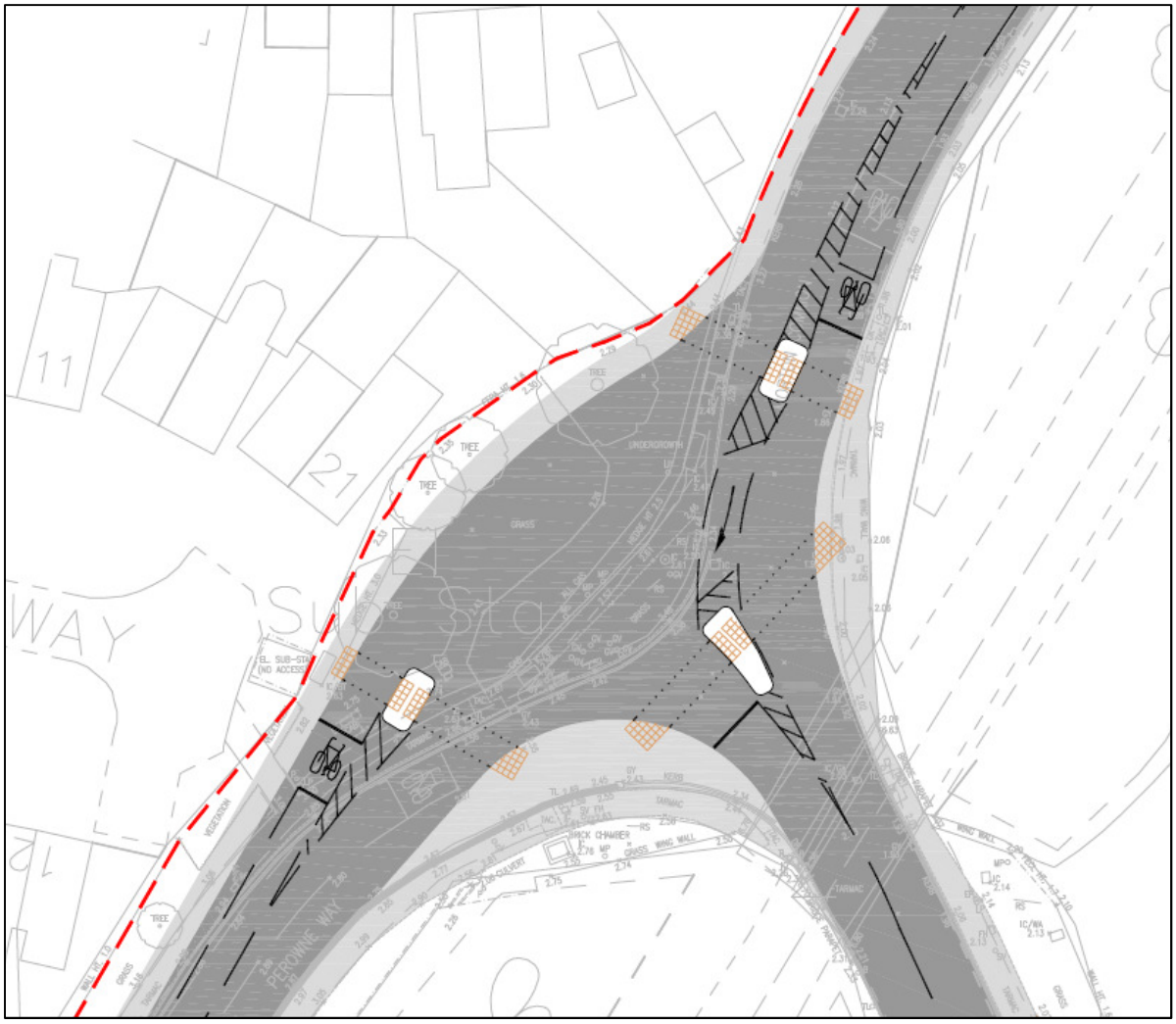
3.14 The proposed design options are presented below in **Figures 3.1** and **3.2**. The 1:200 drawings are included in **Appendix A**.

Figure 3.1 Proposed Junction Layout – Option 1



Source: WYG Drawing A090129-99-006, August 2017

Figure 3.2 Proposed Junction Layout – Option 2



Source: WYG Drawing A090129-99-006 Rev C, April 2018

Forecast/Future Year Modelling

3.15 Forecast or Future Year modelling was undertaken using the proposed highway designs for the junction (Options 1 and 2), as shown in Figures 3.1 and 3.2, to ascertain the effectiveness and feasibility of the design. The Future Year of 2034 was assessed as part of this scenario and thus TEMPRO growth factors were applied to the 2017 traffic survey data in order to calculate the 2034 traffic flows.

3.16 A comparison of TEMPRO growth factors was undertaken for each of the three study areas; Newport, Ryde, Shanklin and Sandown, using local Super Output Areas. It was found that the TEMPRO growth factors for each of the study areas were broadly similar to the TEMPRO growth factors for the Isle of Wight as a whole. As a result, the 'Isle of Wight' as a whole was selected as the geographical area. Also, as all highway junctions within the study area are located in urban areas, it has therefore been deemed more robust that only 'Urban Road Types' were selected as part of this assessment.

3.17 These TEMPRO growth factors are shown in **Table 3.5**.

Table 3.5 2017-2034 TEMPRO Growth Factors – All Urban Road Types

Time Period	TEMPRO Growth Factors (2017-2034)
AM peak	1.2229
PM peak	1.2188

3.18 The Future Year results for the design Options 1 and 2 are summarised in **Table 3.6-3.11** testing a 60, 90 and 120 second cycle time, with full output results included in **Appendix B**.

LinSig Modelling Results – Future Year/Proposals – Option 1

Table 3.6 Future Year Assessment (60 seconds): Option 1

Arm Cycle time 60 secs	AM peak			PM peak		
	Deg Sat (%)	Mean Max Queue (pcu)	Av. Delay Per PCU (s/pcu)	Deg Sat (%)	Mean Max Queue (pcu)	Av. Delay Per PCU (s/pcu)
1/1 – Morton Common	79.6%	10.2	26.3	107.9%	48.5	179.0
2/1 – Avenue Road	70.8%	9.3	20.5	73.4%	10.9	16.6
3/1 – Perowne Way	74.5%	6.1	38.2	102.6%	13.5	169.9
PRC	13.0%			-19.9%		
Total Delay (pcu/hr)	10.79			54.00		

Table 3.7 Future Year Assessment (90 seconds): Option 1

Arm Cycle time 90 secs	AM peak			PM peak		
	Deg Sat (%)	Mean Max Queue (pcu)	Av. Delay Per PCU (s/pcu)	Deg Sat (%)	Mean Max Queue (pcu)	Av. Delay Per PCU (s/pcu)
1/1 – Morton Common	71.0%	12.5	25.1	98.2%	30.1	69.9
2/1 – Avenue Road	58.6%	10.8	17.9	62.6%	12.1	13.5
3/1 – Perowne Way	71.1%	8.1	45.4	94.7%	11.0	114.3
PRC	26.5%			-9.1%		
Total Delay (pcu/hr)	10.79			25.76		

3.19 The Option 1 junction design is expected to operate within capacity during the AM peak, however with slightly less capacity than the existing junction. Within the junction model, it was found that by increasing the cycle time to 90 seconds this improves capacity in comparison to a 60 second cycle time. However, for the PM peak, the junction operates over capacity in the PM peak with Degrees of Saturation (DoS) recorded at over 100% on the Morton Common and Perowne Way arms, and an overall PRC of -9.1% recorded.

3.20 A cycle time of 120 seconds has also been tested, and is shown to further improve capacity in both the AM and PM peaks, the results of which are shown in **Table 3.8**.

Table 3.8 Future Year Assessment (120 seconds): Option 1

Arm Cycle time 120 secs	AM peak			PM peak		
	Deg Sat (%)	Mean Max Queue (pcu)	Av. Delay Per PCU (s/pcu)	Deg Sat (%)	Mean Max Queue (pcu)	Av. Delay Per PCU (s/pcu)
1/1 – Morton Common	69.2%	15.7	29.0	93.3%	30.5	48.9
2/1 – Avenue Road	54.6%	12.9	18.9	58.4%	13.9	12.9
3/1 – Perowne Way	67.3%	10.1	52.0	91.2%	11.7	108.3
PRC	30.1%			-3.6%		
Total Delay (pcu/hr)	12.10			20.65		

3.21 As shown in Table 3.8, increasing the cycle time to 120 seconds, further improves the overall PRC in the AM and PM peaks. For instance, compared to the 90 cycle time scenario in Table 3.3, the PRC increases from 26.5% to 30.1% in the AM peak, whilst in the PM peak, there is an improvement in the PRC from -9.1% to -3.6%. With the improvements in capacity, the northern and western arms (Morton Common and Perowne Way) see a slight reduction in the DoS in the PM peak. However, the Degrees of Saturation still remain over 90%. Overall, in comparison with the existing junction, the Option 1 junction design does bring some benefits to the junction, with improvements shown in both peak periods, however, despite this the PM peak still remains over capacity which is the main peak that is predicted to experience capacity issues in the 2034 Future Year.

LinSig Modelling Results – Future Year/Proposals – Option 2

Table 3.9 Future Year Assessment (60 seconds): Option 2

Arm Cycle time 60 secs	AM peak			PM peak		
	Deg Sat (%)	Mean Max Queue (pcu)	Av. Delay Per PCU (s/pcu)	Deg Sat (%)	Mean Max Queue (pcu)	Av. Delay Per PCU (s/pcu)
1/1 – Morton Common	63.3%	6.3	13.9	105.0%	39.8	136.8
2/1 – Avenue Road	84.2%	11.6	32.6	106.6%	43.5	166.0
3/1 – Perowne Way	87.8%	8.0	60.3	103.3%	14.0	178.7
PRC	2.6%			-18.4%		
Total Delay (pcu/hr)	12.75			77.09		

Table 3.10 Future Year Assessment (90 seconds): Option 2

Arm Cycle time 90 secs	AM peak			PM peak		
	Deg Sat (%)	Mean Max Queue (pcu)	Av. Delay Per PCU (s/pcu)	Deg Sat (%)	Mean Max Queue (pcu)	Av. Delay Per PCU (s/pcu)
1/1 – Morton Common	64.2%	11.4	19.1	87.3%	20.7	31.9
2/1 – Avenue Road	67.8%	12.8	25.5	70.3%	15.0	20.1
3/1 – Perowne Way	68.7%	7.9	43.0	82.7%	7.9	69.1
PRC	31.0%			1.6%		
Total Delay (pcu/hr)	10.92			16.89		

3.22 The Option 2 junction design is expected to operate within capacity during the AM peak, with a PRC of 2.6% recorded, whilst the PM is over capacity recording a PRC of -18.4%. Within the junction model, it was found that by increasing the cycle time to 90 seconds this improves capacity in comparison to a 60 second cycle time. By increasing the cycle time to 90 seconds, the PRC increases from 2.6% to 31.0% in the AM, and from -18.4% to 1.6% in the PM. In comparison to the existing junction and the Option 1 design, the Option 2 design performs much better.

3.23 A cycle time of 120 seconds has also been tested, and is shown to further improve capacity in both the AM and PM peaks, the results of which are shown in **Table 3.11**.

Table 3.11 Future Year Assessment (120 seconds): Option 2

Arm Cycle time 120 secs	AM peak			PM peak		
	Deg Sat (%)	Mean Max Queue (pcu)	Av. Delay Per PCU (s/pcu)	Deg Sat (%)	Mean Max Queue (pcu)	Av. Delay Per PCU (s/pcu)
1/1 – Morton Common	62.6%	14.6	23.3	81.8%	23.8	30.3
2/1 – Avenue Road	60.7%	15.1	25.6	64.2%	17.3	19.3
3/1 – Perowne Way	63.8%	9.7	48.6	78.7%	9.4	73.7
PRC	41.0%			10.1%		
Total Delay (pcu/hr)	12.06			15.63		

3.24 As shown in Table 3.11, increasing the cycle time to 120 seconds, further improves the overall PRC in the AM and PM peaks. For instance, compared to the 90 second cycle time scenario in Table 3.10, the PRC increases from 31.0% to 41.0% in the AM peak, whilst in the PM peak, there is an improvement in the PRC from 1.6% to 10.1%. Overall, in comparison with the existing junction and the Option 1 junction design, the Option 2 design performs much better and provides a solution to the existing capacity issues in the PM peak, allowing the junction to operate within capacity during both peak periods.

Outcome / Conclusions

3.25 The outcome of the modelling scenarios demonstrates that there is some benefit from the proposed Option 1 design. Comparing the existing junction and the proposed junction layout, the modelling output results for Option 1 show capacity improvements in both peak periods, however the PM peak would remain over capacity, which has been identified as the peak experiencing the main capacity issues. A second design option was tested, Option 2, which was shown to perform much than the existing junction and Option 1 design, and in combination with longer cycle times of 90 and 120 seconds, this junction design provides a solution to the existing capacity issues at the junction, allowing the junction to operate within capacity during both peak periods. It is noted that the right-turn storage lane proposed as part of this design alleviates much of the capacity issues on the Morton Common arm. The proposed staggered pedestrian crossings also allow the junction to operate more efficiently by enabling traffic phases to run simultaneously.

Cost/Time Savings Analysis

3.26 A cost savings analysis has been undertaken for the junction based on the delay/time savings as a result of the Option 2 alterations to the junction, in combination with a 120 second cycle time. In order to calculate the cost savings, fuel cost values were extracted for the average car (per km) (petrol / diesel) from the Department for Transport (DfT) document 'Values of Time and Vehicle Operating Costs' Transport Analysis Guidance (TAG), January 2014. The average fuel cost for an average car was extracted as £0.79 per kilometre.

3.27 To calculate the total cost savings, the average speed at the junction was recorded as 28mph (45kph) (based on ATC data collected by MHC Traffic Ltd), which was then applied to the total time savings to the PM peak period (16:00-19:00), as this peak period was shown to exhibit the main capacity issues. As a result, this determined the total distance saved. The average fuel cost per kilometre was then applied to the total distance, giving a total cost saving for the PM peak period, for an average weekday. For the annual cost savings, the total PM peak cost savings were applied to a total of 253 days

(excluding weekends and Bank Holidays), seeing as this assessment only considers an average weekday. The results of this assessment are summarised in **Table 3.12** below.

Table 3.12 Estimated Cost/Time Savings Analysis of Junction 15

Time Period	Average Existing Delay per PCU (secs)	Estimated Average Delay per PCU (secs)	Average Journey Time Savings (secs)	Assumed Length of Time Period (Hours)	Avera-ge No. of PCUs per hour	Time Savings for All Vehicles During Period (secs)	Value of Time Savings Per Period (£)	Value of Time Savings Per Annum
PM peak (16:00-19:00)	159	16	143	3	1330	568575	£5,614.68	£1,420,513.57
TOTAL						**568575**	**£5,614.68**	**£1,420,513.57**

3.28 As shown in Table 3.12, the estimated cost savings per peak period were £5,614.68 in the PM peak and thus, the overall annual fuel cost savings was estimated to be £1,420,513.57.

4 Preferred Scheme

General

4.1 There are various opportunities to initiate highway junction improvements in the IOW. In general, the IOW is characterised by high car ownership levels, and it is often the most convenient and fastest way to travel around the island. Thus, the 15 highway junctions identified are areas which currently experience issues such as high levels of congestion, queuing, poor vehicle behaviour and lane discipline.

4.2 This chapter considers the preferred improvement option for the A3055 Morton Common / Avenue Road / Perowne Way three-arm signalised junction. Drawings of the proposals are additionally included in **Appendix A**.

Aims and Objectives

4.3 The main purpose of the proposed improvements is to improve the operation, flow of traffic and queuing at each of the junctions. Consideration is to be given to the most dominant road movements and accommodating heavy goods vehicles (HGVs) at each junction. Therefore, measures which address the flow of traffic, facilitate lane changing, reduce congestion and queuing are to be the most beneficial for achieving the aims of this feasibility study.

Proposed Junction Improvements

Junction Issues

4.4 Current issues specific to the A3055 Morton Common / Avenue Road / Perowne Way three-arm signalised junction include:

- High northbound and southbound flows along the A3055 Morton Common / Avenue Road, which results in queuing during both the AM and PM peaks.
- A high number of right-turners from Morton Common to Perowne Way, which inevitably blocks southbound traffic and results in queuing.

Opportunities

4.5 The opportunities to improve the three-arm signalised junction are primarily focused on:

- Improving the flow of traffic through the junction, in particular for those vehicles turning right from Morton Common to Perowne Way;
- Giving greater priority to dominant traffic movements such as the northbound and southbound traffic (straight-ahead); and
- Reducing existing traffic congestion, queuing and delays.

Proposals

4.6 From the traffic modelling, it has been determined that the Option 2 junction design is the preferred scheme for the Morton Common / Avenue Road / Perowne Way signalised junction. Option 2 includes the widening of Perowne Way along the northwestern side of the junction, which allows for a right-turn storage lane to be placed in the centre of the junction, with storage for up to 1 PCU. As part of this design, staggered pedestrian crossings are to be implemented across each of the arms, whilst the stoplines on Morton Common and Avenue Road are to be moved forward.

4.7 At present, the junction has little signage and therefore it is proposed that signage, clear road markings and advisory information should be included as part of the design. It is anticipated that this will encourage correct lane discipline amongst drivers, on their approach to the junction. Signs and clear road markings directing drivers to nearby landmarks within Sandown and Shanklin is likely to improve the efficiency and flow of traffic through the junction.

Outcome and Conclusions

4.8 The outcome of the modelling scenarios demonstrates that the Option 2 junction design provides a solution to the existing capacity issues at the junction, with this design predicted to operate within capacity in both peak periods, in combination with a 90 and 120 second cycle time. Therefore, it was found to perform better than the existing junction and proposed Option 1 design, and as a result, it can be considered that Option 2 would be the preferred scheme.

Costs

4.9 This section of the feasibility study sets out an indication of the costs of the proposals at each section of the study area. The costs are based on appraisal of construction prices from SPONS and WYG's understanding of similar schemes developed for other local authorities. The cost estimate is identified in **Table 4.1**.

Perowne Way

4.10 The scope of improvements includes the following:

a) Kerbline to be realigned on the western side, construction of new carriageway and new footway.

b) New pedestrian refuge to be constructed. Signals to be relocated.

c) Existing road markings to be removed and new markings to be implemented where applicable.

d) New footway to be construction to the eastern side of Perowne Way.

e) New traffic signs where applicable.

Morton Common

4.11 The scope of improvements includes the following:

a) New pedestrian refuge to be constructed. Signals to be relocate.

b) Existing road markings to be removed and new markings to be implemented where applicable.

c) New footway to be construction to the eastern side of Morton Common.

d) New traffic signs where applicable.

Avenue Road

4.12 The scope of improvements includes the following:

a) New pedestrian refuge to be constructed. Signals to be relocate.

b) Existing road markings to be removed and new markings to be implemented where applicable.

c) New footway to be construction to the eastern and western side of Avenue Road.

Summary

4.13 **Table 4.1** sets out a summary of the indicative estimated costs for the proposals within the study area.

Table 4.1 Cost Estimate of Proposals – Summary

Proposal	Cost Estimate
Construction Estimate	£236,200.00
Risk Variables (Statutory Undertakers, Safety Audit requirements)	£118,000.00
Design Administration and TRO Fees	£20,500.00
Total	**£374,700.00**

Source: WYG, April 2018 *Note: The Risk variables etc may differ from the stated estimates in Table 4.1 as there was limited information as to what is contained within the BT cabinets etc.*

5 Summary and Conclusions

Summary

5.1 WYG have been appointed by the Isle of Wight (IOW) Council to undertake a feasibility study for a series of highway junctions located throughout the island, with a particular focus on the towns of Newport, Ryde, Shanklin and Sandown. The study has been carried out to identify traffic management issues impacting on all road users and develop proposals that will form part of a package of schemes to be progressed as part of the Council's Local Implementation Plan (LIP) process.

5.2 IOW Council has identified 15 highway junctions which currently experience traffic issues such as congestion and queuing. The study considers where the main issues lie in relation to traffic movement, road safety, bus operation, pedestrian and cycle provision, public realm, parking provision and servicing. Each of the 15 highway junctions are to be supplemented by a feasibility study report, with traffic modelling software used to test the various proposals in order to identify a range of measures aimed at improving the behaviour and movement of traffic at each junction.

5.3 The 'T' junction at Perowne Way / Morton Common and Avenue Road is located approximately 1 km to the east of Sandown railway station on the northern edge of Sandown. Perowne Way forms the western arm, Morton Common forms the eastern arm and Avenue Road forms the southern arm.

5.4 The A3055 – Avenue Road forms the main route which leads down to the Esplanade. Perowne Way provides access to a number of residential side streets as well as access to the Fairway Holiday Park, and also provides access to Sandown Rail station.

5.5 At present, the junction is known to experience congestion and queuing, which has been observed on a site visit and during traffic surveys at the junction. It was observed that congestion and queuing is particularly evident on Morton Common and Avenue Road (A3055).

5.6 Within the junctions identified, there are a number of priority, roundabouts, gyratories and signalised junctions. The traffic signal modelling software was used to model the three-arm signalised junction as part of this report. The modelling has been undertaken for two weekday periods determined to be the network peaks in terms of traffic volumes, with the AM peak between 08:00 and 09:00 and the PM peak between 17:00 and 18:00. The Base Year results indicate that the junction operates within recommended capacity during the AM and PM peaks. However, it is shown that in the PM peak the A3055 Morton Common and Perowne Way arms are approaching capacity, with a DoS of 86.0% and 77.9% recorded respectively.

5.7 As a result, improvements to the signalised junction have been focused around improving the flow of traffic through the junction, in particular for those vehicles turning right from Morton Common to Perowne Way. It is anticipated that this will result in a reduction in congestion and queuing.

5.8 With the proposed junction designs, Options 1 and 2 tested, the results indicated that the junction is predicted to operate within capacity during the AM peak, however, it exceeds capacity in the PM peak (based on the existing 60 second cycle time). Within the junction model, it was found that by increasing the cycle time to 90 and 120 seconds, this improves capacity in comparison to a 60 second cycle time.

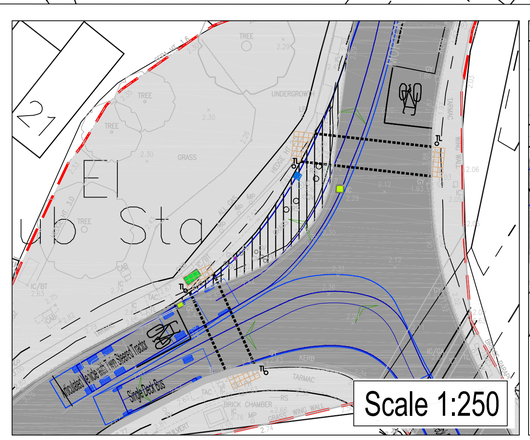
5.9 It was found that overall the Option 2 design performed much better than the existing junction and Option 1 design. A 120 second cycle time was also tested, which in combination with the Option 2 design, provided a solution to the existing capacity issues, allowing the junction to operate within capacity during both peak periods. Therefore, it was concluded that the Option 2 design would be the most feasible and preferable scheme.

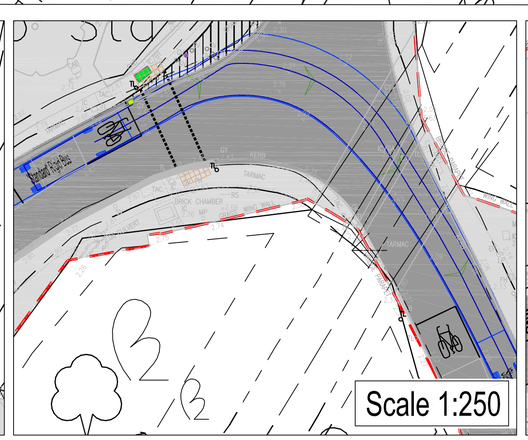
Conclusions

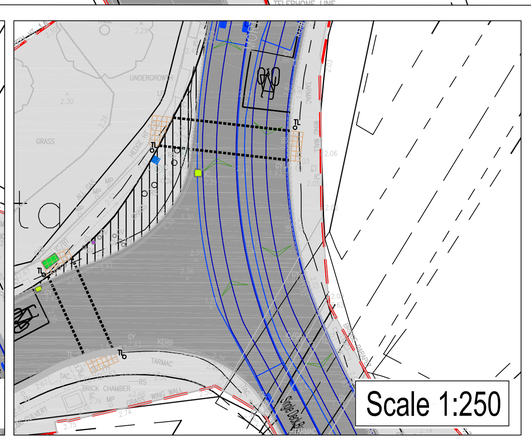
5.10 The outcome of the modelling scenarios demonstrates that there is some benefit from the proposed Option 1 design. Comparing the existing junction and the proposed junction layout, the modelling output results for Option 1 show capacity improvements in both peak periods, however the PM peak would remain over capacity, which was identified as the peak experiencing the main capacity issues. A second design option was tested, Option 2, which was shown to perform much than the existing junction and Option 1 design, and in combination with longer cycle times of 90 and 120 seconds, this junction design provides a solution to the existing capacity issues at the junction, allowing the junction to operate within capacity during both peak periods.

5.11 Therefore, it is recommended that the Option 2 design should be implemented in combination with a longer cycle time of 120 seconds, to provide the optimum benefit.

Appendix A
1:200 DRAWINGS







Notes:

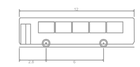
General
1. Do not scale from drawing.
2. All dimensions are in metres, unless stated otherwise.
3. This drawing is to be read & printed in colour.
4. This drawing is for illustrative purposes only.

Disclaimer
1. The information contained in this drawing is based on a combination of OS and data provided by others and WYG shall not be liable for any inaccuracies or deficiencies.

KEY:

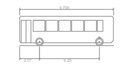
- Extent of highway boundary
- Existing carriageway
- Existing footway / public realm
- Existing road marking
- Proposed road marking
- New carriageway construction
- Existing gullies to be relocated
- Proposed new location of gullies
- Existing BT inspection chamber

Vehicles Used:



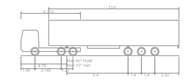
'Standard' Rigid Bus

Overall Length	12.000m
Overall Width	2.550m
Overall Body Height	3.060m
Min Body Ground Clearance	0.350m
Track Width	2.500m
Lock to Lock Time	4.00s
Wall to Wall Turning Radius	10.771m



Single Deck Bus

Overall Length	9.795m
Overall Width	2.500m
Overall Body Height	3.070m
Min Body Ground Clearance	0.370m
Track Width	2.323m
Lock to Lock Time	6.00s
Kerb to Kerb Turning Radius	10.111m



Articulated Vehicle with Twin Steered Tractor

Overall Length	16.500m
Overall Width	2.550m
Overall Body Height	3.891m
Min Body Ground Clearance	0.400m
Max Track Width	2.500m
Lock to Lock Time	4.50s
Kerb to Kerb Turning Radius	6.987m

INDICATIVE

REV	DETAILS	DRAWN BY	CHECKED BY	DATE

CLIENT:
Isle of Wight Council

PROJECT:
Isle of Wight Junction Assessment

DRAWING TITLE:
Junction 15 - Sandown Option 1

SCALES:	SHEET SIZE:
As Shown	A1

DRAWN:	CHECKED:	DATE:
SJR	NW	18.12.2017

WYG Transport
part of WYG group
11th Floor 1 Angel Court London EC2R 7HJ
t: 0207 250 7500 f: 0207 250 7501 e: transport@wyg.com

DRAWING NUMBER: A090129-99-006

REVISION:

Scale 1:200

Scale 1:250

Scale 1:250

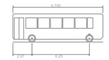
Scale 1:250

Notes:

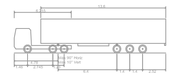
General
1. Do not scale from drawing.
2. All dimensions are in metres, unless stated otherwise.
3. This drawing is to be read & printed in colour.
4. This drawing is for illustrative purposes only.

Disclaimer
1. The information contained in this drawing is based on a combination of OS and data provided by others and WYG shall not be liable for any inaccuracies or deficiencies.

Vehicles Used:



Single Deck Bus	
Overall Length	9.795m
Overall Width	2.500m
Overall Body Height	3.200m
Min Body Ground Clearance	0.309m
Track Width	2.350m
Lock to Lock Time	6.00s
Kerb to Kerb Turning Radius	10.111m



Articulated Vehicle with Twin Steered Tractor	
Overall Length	16.500m
Overall Width	2.550m
Overall Body Height	3.691m
Min Body Ground Clearance	0.429m
Max Track Width	2.500m
Lock to Lock Time	6.00s
Kerb to Kerb Turning Radius	6.987m

Key:

- Extent of highway boundary
- Existing carriageway
- Existing footway
- Existing road marking
- Proposed road marking
- New pedestrian island construction

INDICATIVE

REV	DETAILS	DRAWN BY	CHECKED BY	DATE

CLIENT:
Isle of Wight Council

PROJECT:
Isle of Wight Junction Assessment

DRAWING TITLE:
Junction 15 - Sandown Option 2

SCALES:	SHEET SIZE:
As Shown	A1

DRAWN:	CHECKED:	DATE:
SJR	NW	18.12.2017

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t: 0207 250 7500 f: 0207 250 7501 e: transport@wyg.com

DRAWING NUMBER: A090129-99-006

REVISION:

Appendix B
MODELLING OUTPUT RESULTS

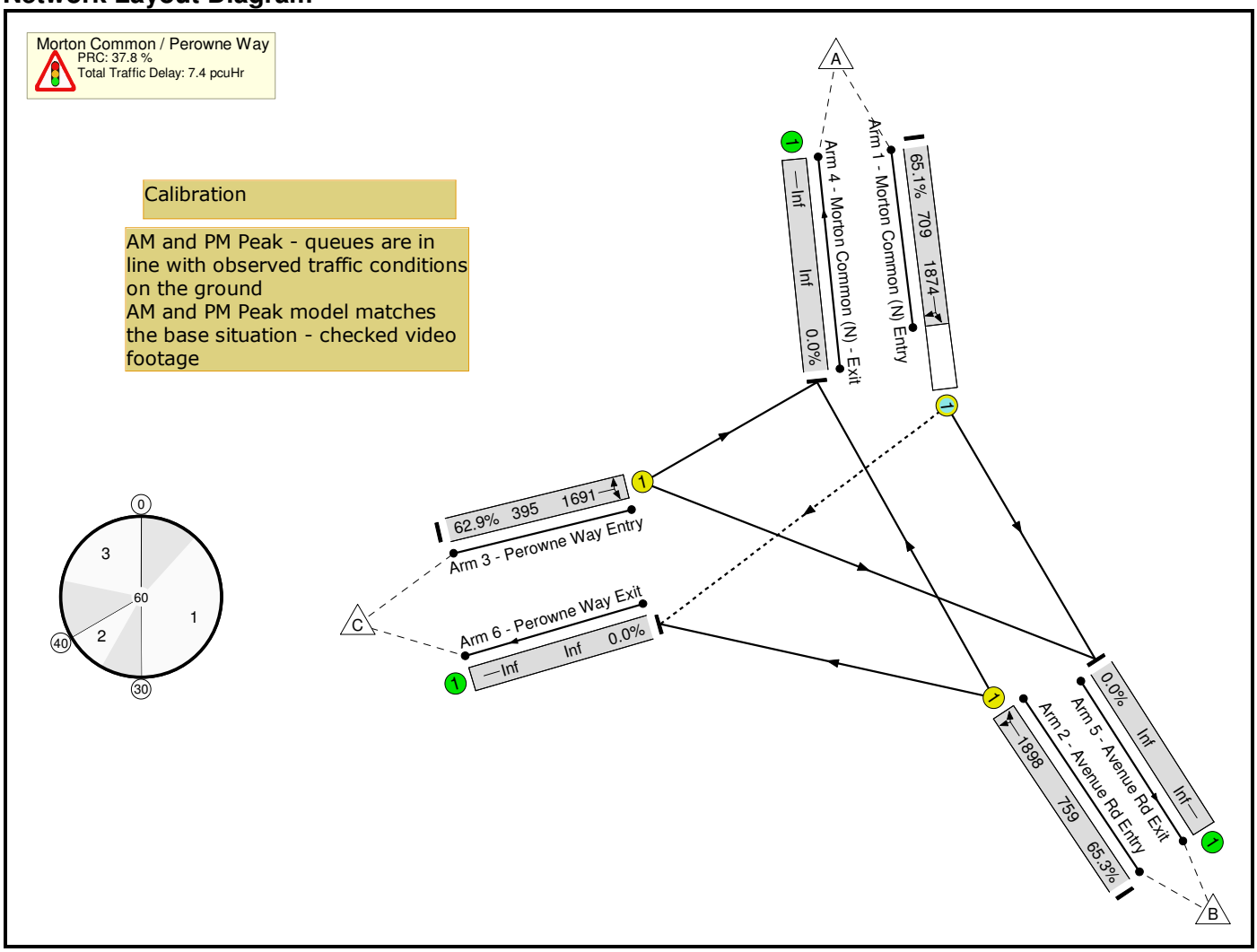
Basic Results Summary

User and Project Details

Project:	
Title:	
Location:	
Additional detail:	
File name:	Morton Common - Perowne Way RD - JS edit - 25.01.2018.lsg3x
Author:	
Company:	
Address:	

Scenario 1: '2017 Base AM' (FG1: '2017 Base 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	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**65.3%**	**44**	**20**	**5**	**7.4**	**-**	**-**
Morton Common / Perowne Way	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**65.3%**	**44**	**20**	**5**	**7.4**	**-**	**-**
1/1	Morton Common (N) Entry Ahead Right	O	C	G	1	35	5	461	1874	709	65.1%	44	20	5	2.1	16.8	7.2
2/1	Avenue Rd Entry Ahead Left	U	A		1	23	-	496	1898	759	65.3%	-	-	-	3.0	21.4	7.5
3/1	Perowne Way Entry Left Right	U	B		1	13	-	248	1691	395	62.9%	-	-	-	2.3	32.8	4.5

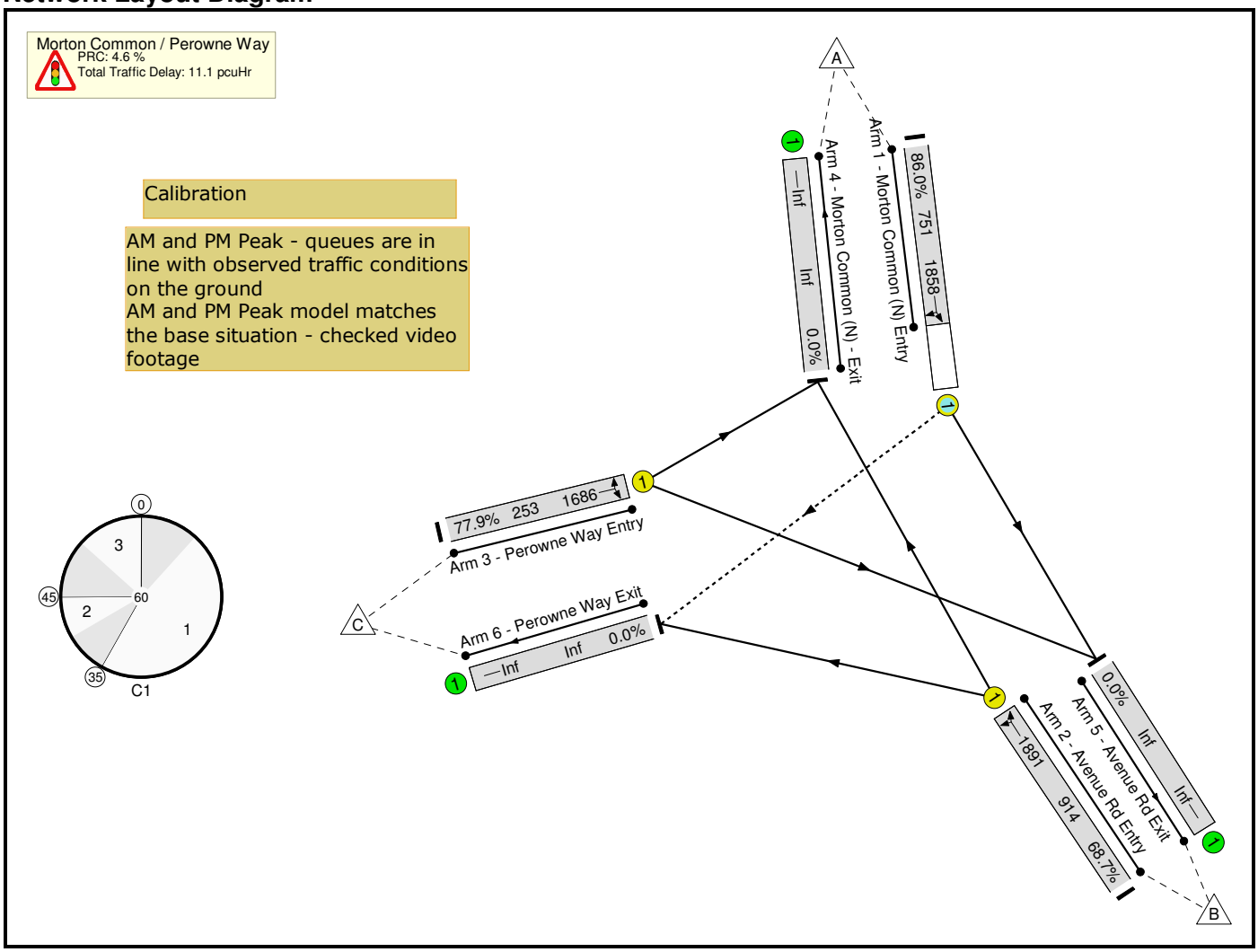
C1 PRC for Signalled Lanes (%): 37.8 Total Delay for Signalled Lanes (pcuHr): 7.36 Cycle Time (s): 60

PRC Over All Lanes (%): 37.8 Total Delay Over All Lanes(pcuHr): 7.36

Basic Results Summary

Scenario 2: '2017 Base PM' (FG2: '2017 Base 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	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**86.0%**	**65**	**50**	**16**	**11.1**	**-**	**-**
Morton Common / Perowne Way	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**86.0%**	**65**	**50**	**16**	**11.1**	**-**	**-**
1/1	Morton Common (N) Entry Ahead Right	O	C	G	1	40	5	646	1858	751	86.0%	65	50	16	4.9	27.2	12.2
2/1	Avenue Rd Entry Ahead Left	U	A		1	28	-	628	1891	914	68.7%	-	-	-	3.2	18.2	9.1
3/1	Perowne Way Entry Left Right	U	B		1	8	-	197	1686	253	77.9%	-	-	-	3.0	54.9	4.8

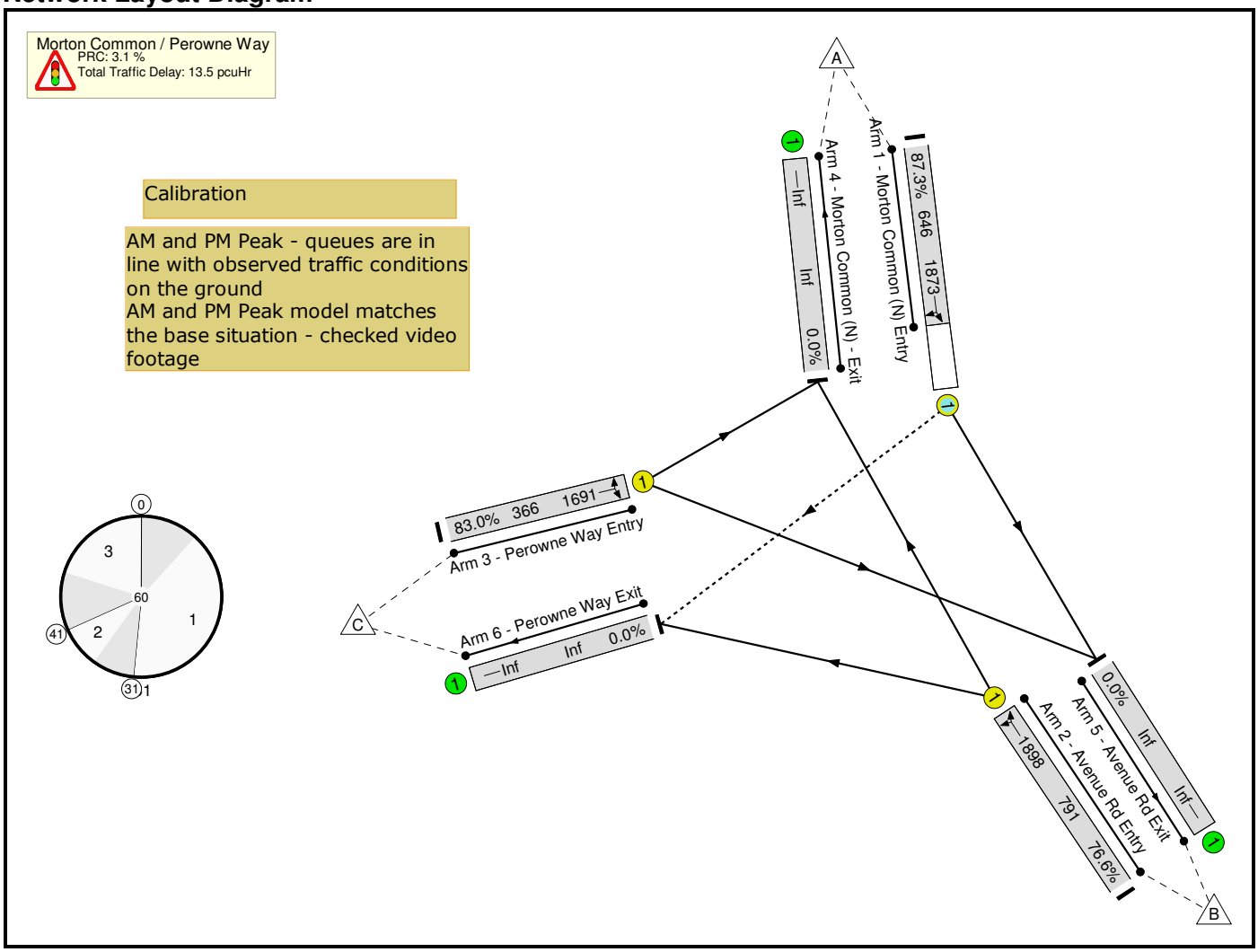
C1 PRC for Signalled Lanes (%): 4.6 Total Delay for Signalled Lanes (pcuHr): 11.07 Cycle Time (s): 60

PRC Over All Lanes (%): 4.6 Total Delay Over All Lanes(pcuHr): 11.07

Basic Results Summary

Scenario 3: '2034 Base AM' (FG3: '2034 Base 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	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**87.3%**	**33**	**37**	**14**	**13.5**	**-**	**-**
Morton Common / Perowne Way	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**87.3%**	**33**	**37**	**14**	**13.5**	**-**	**-**
1/1	Morton Common (N) Entry Ahead Right	O	C	G	1	36	5	564	1873	646	87.3%	33	37	14	5.2	33.1	12.0
2/1	Avenue Rd Entry Ahead Left	U	A		1	24	-	606	1898	791	76.6%	-	-	-	4.1	24.6	10.2
3/1	Perowne Way Entry Left Right	U	B		1	12	-	304	1691	366	83.0%	-	-	-	4.2	49.3	7.1

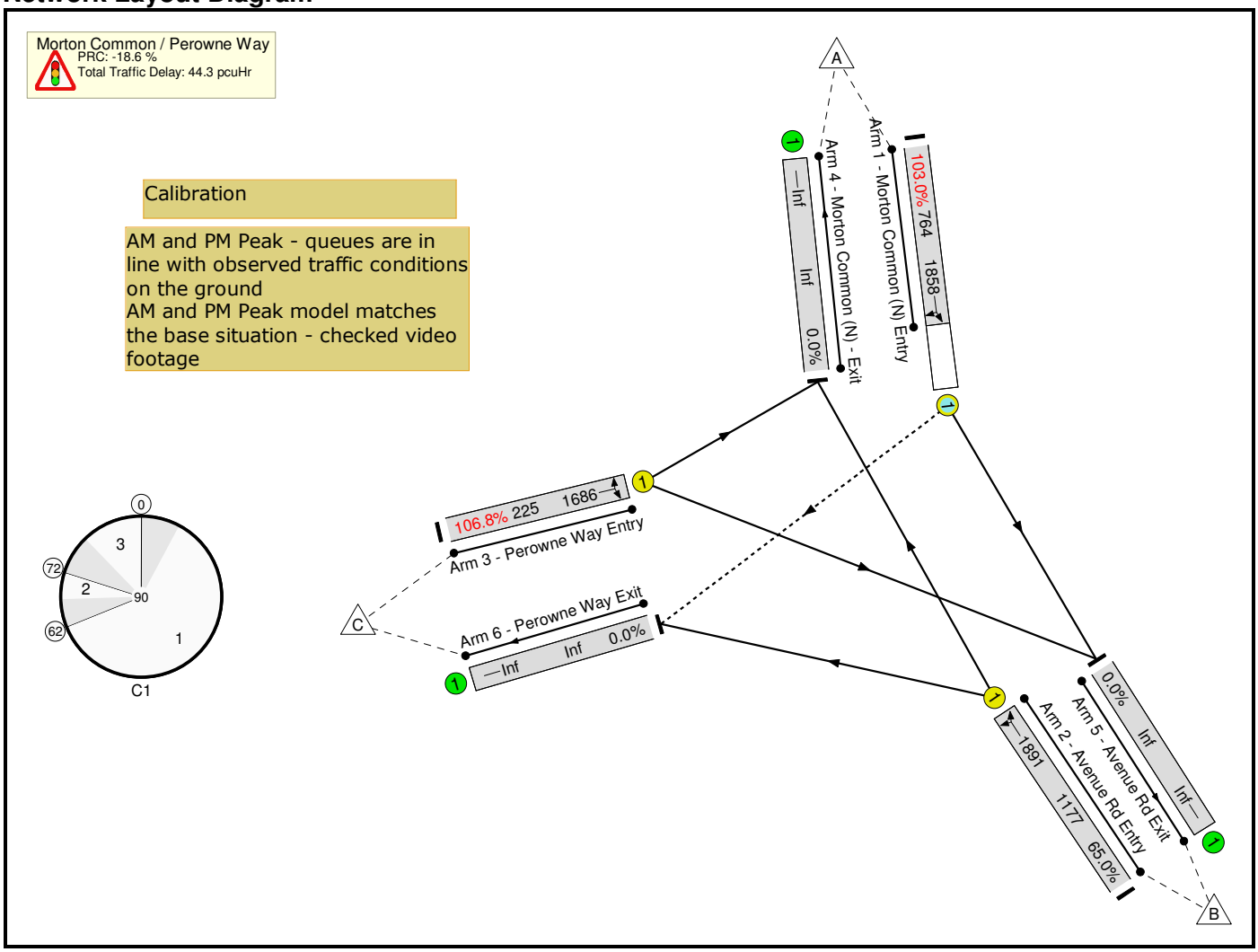
C1 PRC for Signalled Lanes (%): 3.1 Total Delay for Signalled Lanes (pcuHr): 13.49 Cycle Time (s): 60

PRC Over All Lanes (%): 3.1 Total Delay Over All Lanes(pcuHr): 13.49

Basic Results Summary

Scenario 4: '2034 Base PM' (FG4: '2034 Base 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	-	-	-		-	-	-	-	-	-	**106.8%**	**97**	**42**	**16**	**44.3**	-	-
Morton Common / Perowne Way	-	-	-		-	-	-	-	-	-	**106.8%**	**97**	**42**	**16**	**44.3**	-	-
1/1	Morton Common (N) Entry Ahead Right	O	C	G	1	67	5	787	1858	764	103.0%	97	42	16	25.3	115.9	40.4
2/1	Avenue Rd Entry Ahead Left	U	A		1	55	-	765	1891	1177	65.0%	-	-	-	3.2	15.1	13.0
3/1	Perowne Way Entry Left Right	U	B		1	11	-	240	1686	225	106.8%	-	-	-	15.8	237.0	19.0

C1

PRC for Signalled Lanes (%): -18.6
PRC Over All Lanes (%): -18.6

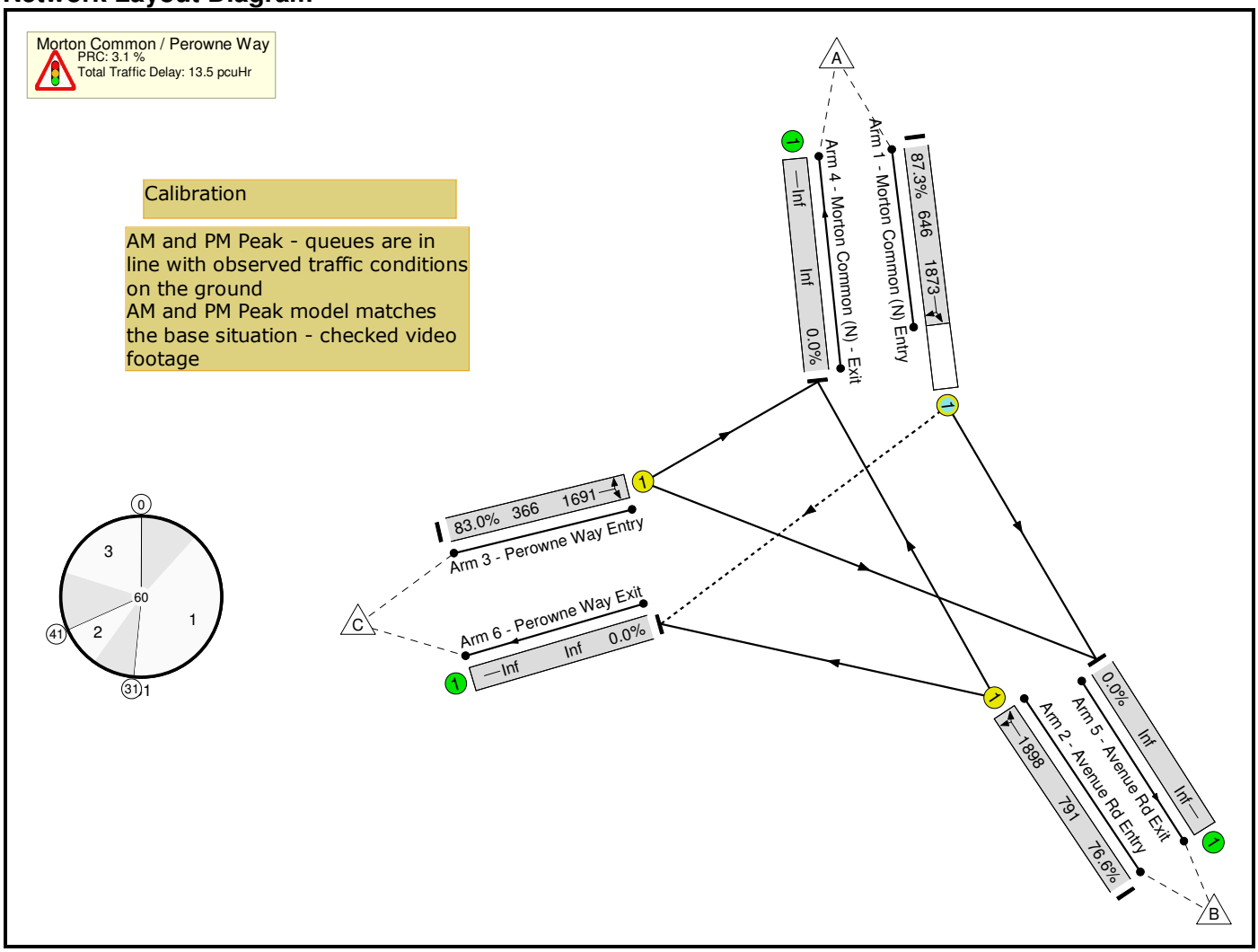
Total Delay for Signalled Lanes (pcuHr): 44.35
Total Delay Over All Lanes(pcuHr): 44.35

Cycle Time (s): 90

Basic Results Summary

Scenario 5: '2034 Base AM - 60 secs' (FG3: '2034 Base 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	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**87.3%**	**33**	**37**	**14**	**13.5**	**-**	**-**
Morton Common / Perowne Way	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**87.3%**	**33**	**37**	**14**	**13.5**	**-**	**-**
1/1	Morton Common (N) Entry Ahead Right	O	C	G	1	36	5	564	1873	646	87.3%	33	37	14	5.2	33.1	12.0
2/1	Avenue Rd Entry Ahead Left	U	A		1	24	-	606	1898	791	76.6%	-	-	-	4.1	24.6	10.2
3/1	Perowne Way Entry Left Right	U	B		1	12	-	304	1691	366	83.0%	-	-	-	4.2	49.3	7.1

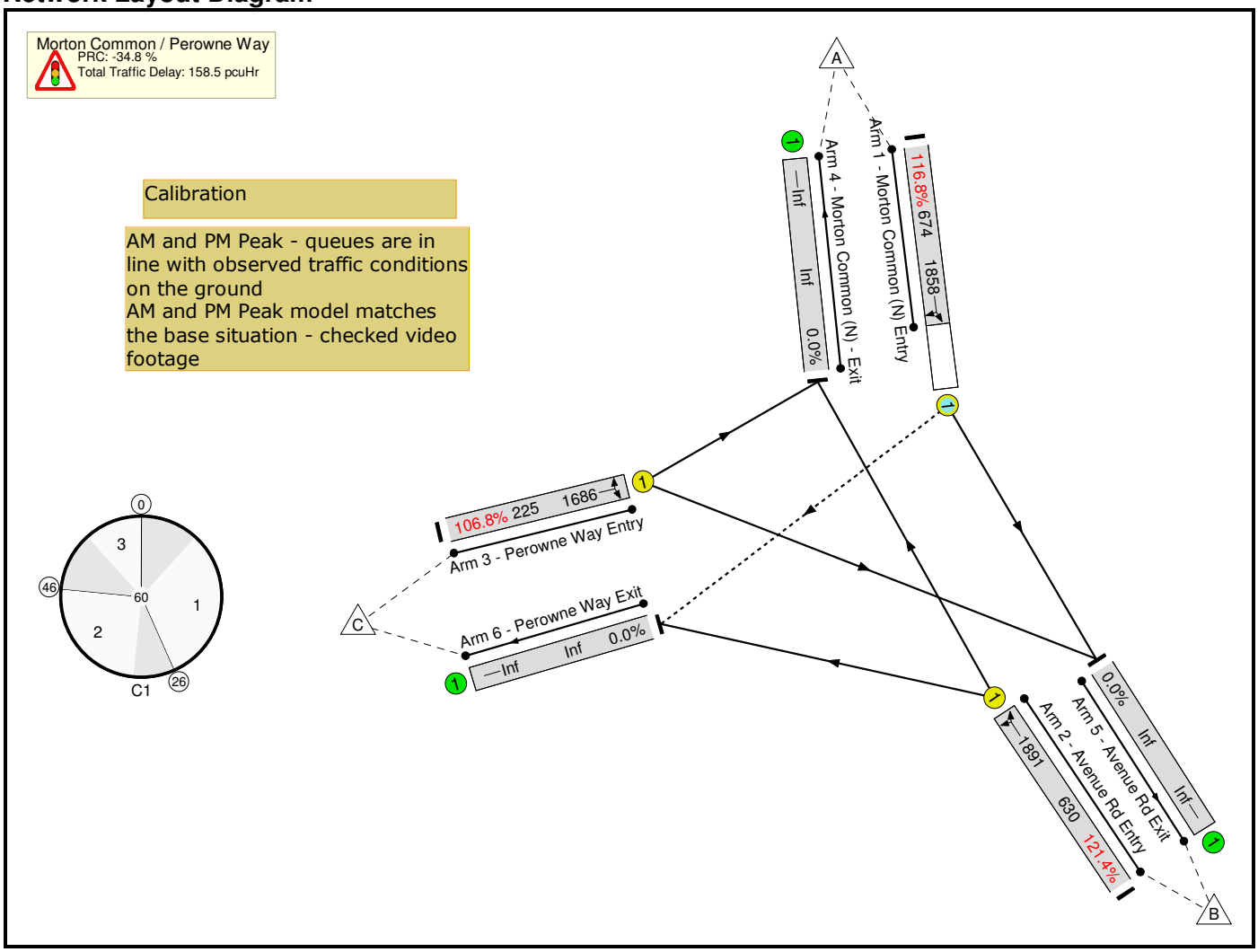
C1 PRC for Signalled Lanes (%): 3.1 Total Delay for Signalled Lanes (pcuHr): 13.49 Cycle Time (s): 60

PRC Over All Lanes (%): 3.1 Total Delay Over All Lanes(pcuHr): 13.49

Basic Results Summary

Scenario 6: '2034 Base PM - 60 secs' (FG4: '2034 Base 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	-	-	-		-	-	-	-	-	-	**121.4%**	**0**	**113**	**24**	**158.5**	-	-
Morton Common / Perowne Way	-	-	-		-	-	-	-	-	-	**121.4%**	**0**	**113**	**24**	**158.5**	-	-
1/1	Morton Common (N) Entry Ahead Right	O	C	G	1	41	15	787	1858	674	116.8%	0	113	24	65.7	300.6	75.0
2/1	Avenue Rd Entry Ahead Left	U	A		1	19	-	765	1891	630	121.4%	-	-	-	78.1	367.6	85.1
3/1	Perowne Way Entry Left Right	U	B		1	7	-	240	1686	225	106.8%	-	-	-	14.7	220.1	16.7

C1

PRC for Signalled Lanes (%): -34.8
PRC Over All Lanes (%): -34.8

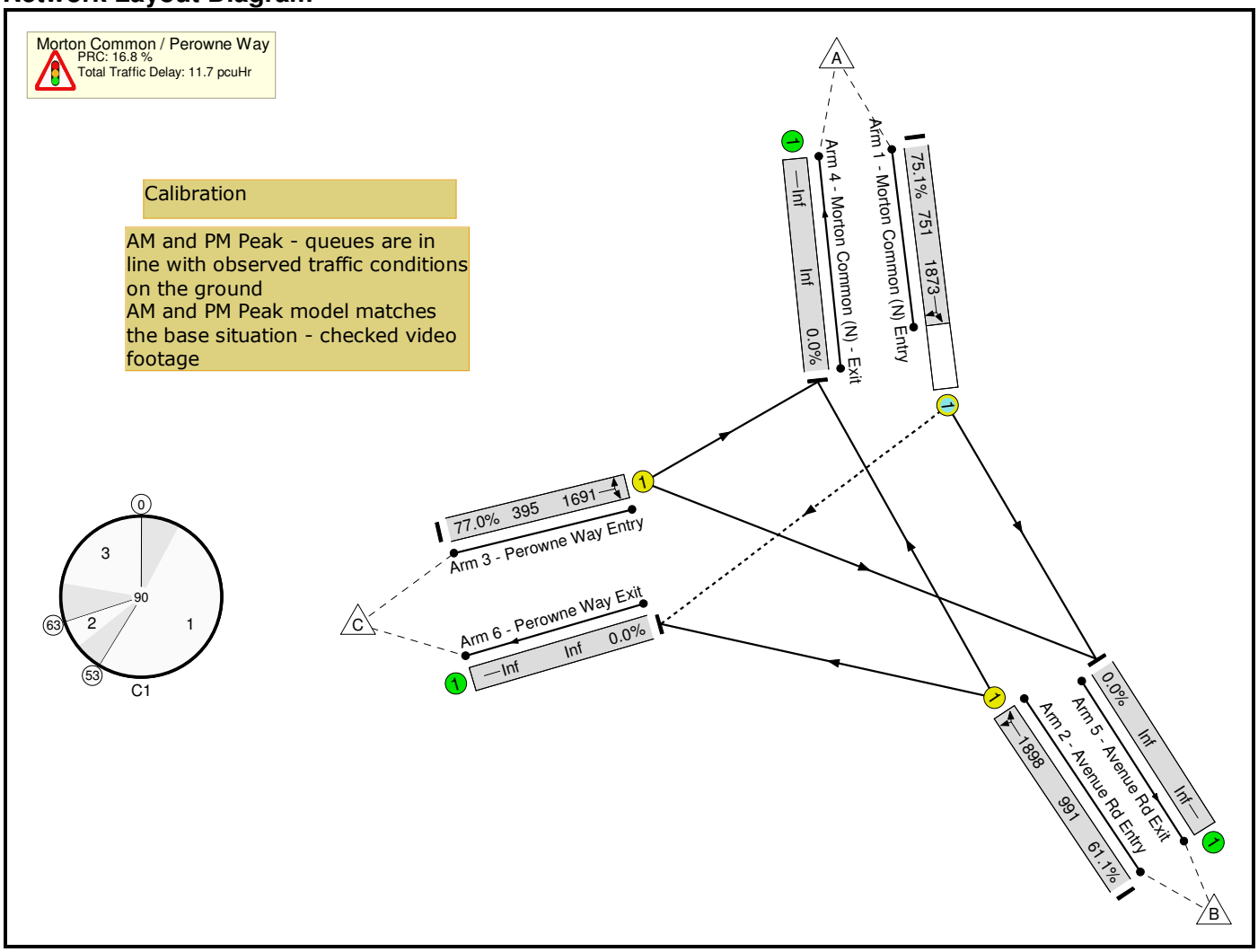
Total Delay for Signalled Lanes (pcuHr): 158.50
Total Delay Over All Lanes(pcuHr): 158.50

Cycle Time (s): 60

Basic Results Summary

Scenario 7: '2034 Base AM - 90 secs' (FG3: '2034 Base 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	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**77.0%**	**69**	**11**	**4**	**11.7**	**-**	**-**
Morton Common / Perowne Way	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**77.0%**	**69**	**11**	**4**	**11.7**	**-**	**-**
1/1	Morton Common (N) Entry Ahead Right	O	C	G	1	58	5	564	1873	751	75.1%	69	11	4	4.0	25.8	12.9
2/1	Avenue Rd Entry Ahead Left	U	A		1	46	-	606	1898	991	61.1%	-	-	-	3.3	19.7	11.4
3/1	Perowne Way Entry Left Right	U	B		1	20	-	304	1691	395	77.0%	-	-	-	4.3	51.4	8.7

C1

PRC for Signalled Lanes (%): 16.8
PRC Over All Lanes (%): 16.8

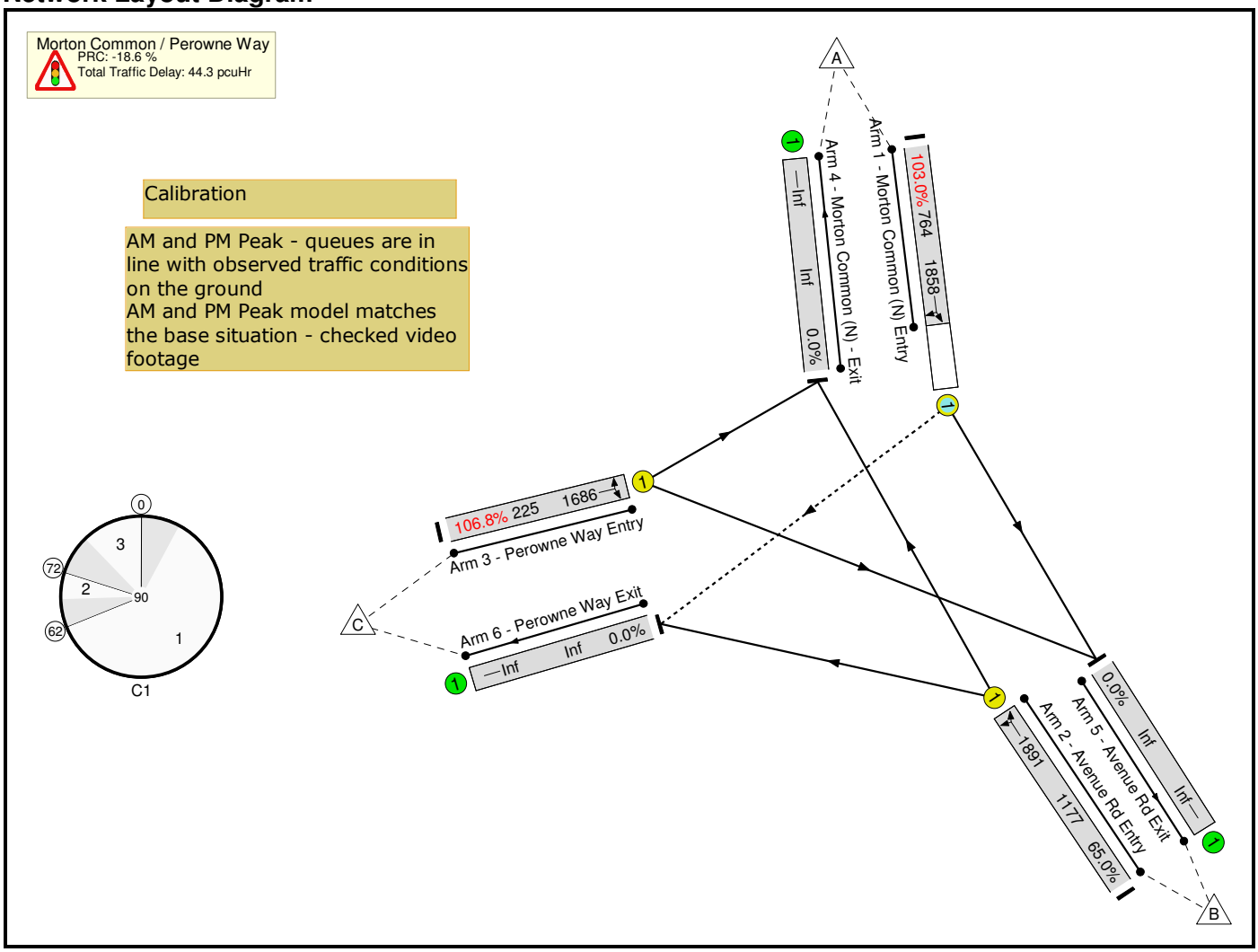
Total Delay for Signalled Lanes (pcuHr): 11.71
Total Delay Over All Lanes(pcuHr): 11.71

Cycle Time (s): 90

Basic Results Summary

Scenario 8: '2034 Base PM - 90 secs' (FG4: '2034 Base 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	-	-	-		-	-	-	-	-	-	**106.8%**	**97**	**42**	**16**	**44.3**	-	-
Morton Common / Perowne Way	-	-	-		-	-	-	-	-	-	**106.8%**	**97**	**42**	**16**	**44.3**	-	-
1/1	Morton Common (N) Entry Ahead Right	O	C	G	1	67	5	787	1858	764	103.0%	97	42	16	25.3	115.9	40.4
2/1	Avenue Rd Entry Ahead Left	U	A		1	55	-	765	1891	1177	65.0%	-	-	-	3.2	15.1	13.0
3/1	Perowne Way Entry Left Right	U	B		1	11	-	240	1686	225	106.8%	-	-	-	15.8	237.0	19.0

C1

PRC for Signalled Lanes (%): -18.6
PRC Over All Lanes (%): -18.6

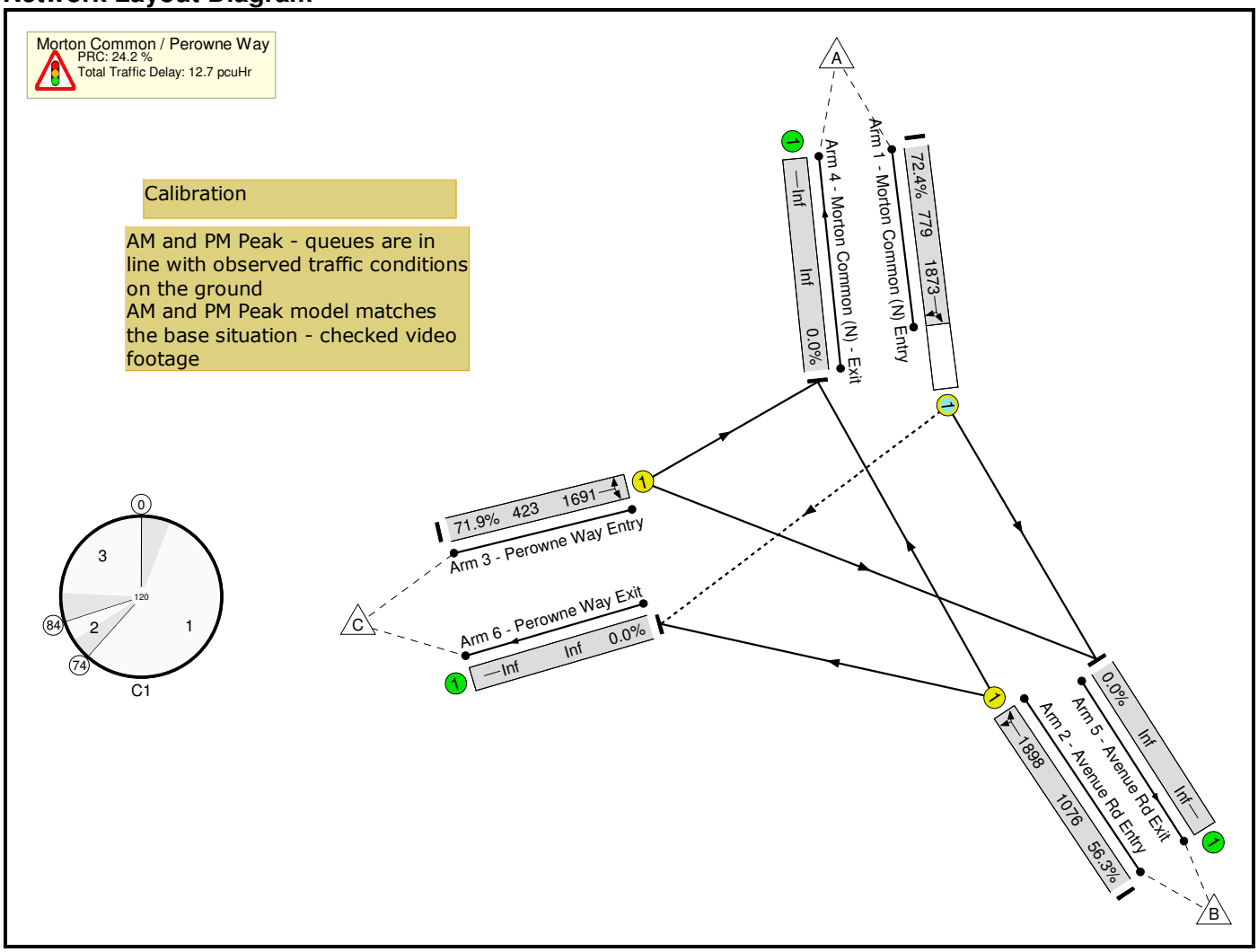
Total Delay for Signalled Lanes (pcuHr): 44.35
Total Delay Over All Lanes(pcuHr): 44.35

Cycle Time (s): 90

Basic Results Summary

Scenario 9: '2034 Base AM - 120 secs' (FG3: '2034 Base 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	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**72.4%**	**76**	**6**	**3**	**12.7**	**-**	**-**
Morton Common / Perowne Way	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**72.4%**	**76**	**6**	**3**	**12.7**	**-**	**-**
1/1	Morton Common (N) Entry Ahead Right	O	C	G	1	79	5	564	1873	779	72.4%	76	6	3	4.5	28.9	15.7
2/1	Avenue Rd Entry Ahead Left	U	A		1	67	-	606	1898	1076	56.3%	-	-	-	3.4	20.4	13.4
3/1	Perowne Way Entry Left Right	U	B		1	29	-	304	1691	423	71.9%	-	-	-	4.7	56.0	10.5

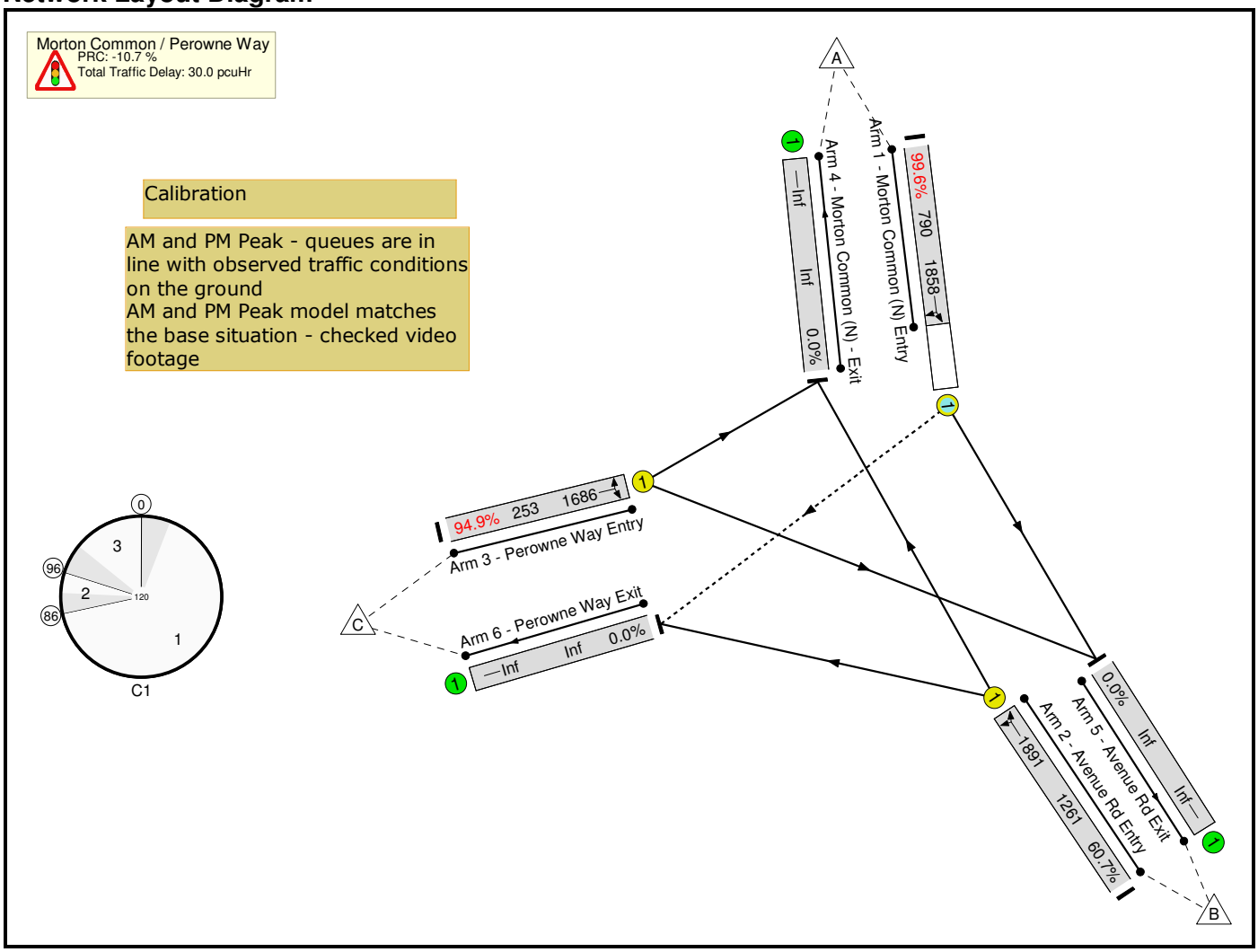
C1 PRC for Signalled Lanes (%): 24.2 Total Delay for Signalled Lanes (pcuHr): 12.69 Cycle Time (s): 120

PRC Over All Lanes (%): 24.2 Total Delay Over All Lanes(pcuHr): 12.69

Basic Results Summary

Scenario 10: '2034 Base PM - 120 secs' (FG4: '2034 Base 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	-	-	-		-	-	-	-	-	-	**99.6%**	**117**	**31**	**12**	**30.0**	-	-
Morton Common / Perowne Way	-	-	-		-	-	-	-	-	-	**99.6%**	**117**	**31**	**12**	**30.0**	-	-
1/1	Morton Common (N) Entry Ahead Right	O	C	G	1	91	5	787	1858	790	99.6%	117	31	12	18.3	83.9	38.6
2/1	Avenue Rd Entry Ahead Left	U	A		1	79	-	765	1891	1261	60.7%	-	-	-	3.1	14.8	15.0
3/1	Perowne Way Entry Left Right	U	B		1	17	-	240	1686	253	94.9%	-	-	-	8.5	128.0	13.0

C1

PRC for Signalled Lanes (%): -10.7
PRC Over All Lanes (%): -10.7

Total Delay for Signalled Lanes (pcuHr): 30.02
Total Delay Over All Lanes(pcuHr): 30.02

Cycle Time (s): 120

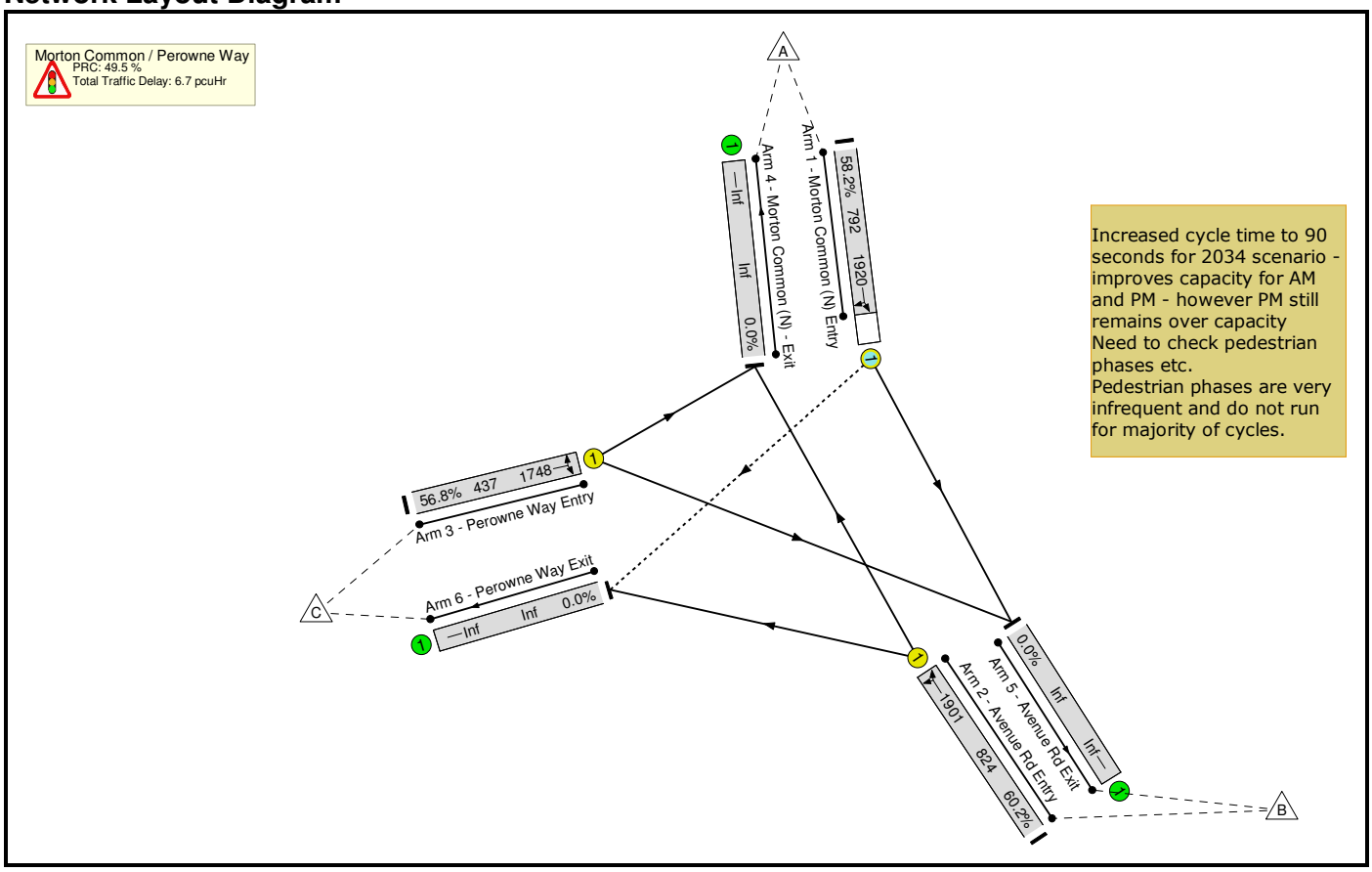
Basic Results Summary

User and Project Details

Project:	
Title:	
Location:	
Additional detail:	
File name:	Morton Common - Perowne Way - Proposed Junction - JS edit - 25.01.18.lsg3x
Author:	
Company:	
Address:	

Scenario 1: '2017 Base AM' (FG1: '2017 Base 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	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**60.2%**	**56**	**10**	**2**	**6.7**	**-**	**-**
Morton Common / Perowne Way	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**60.2%**	**56**	**10**	**2**	**6.7**	**-**	**-**
1/1	Morton Common (N) Entry Ahead Right	O	C	G	1	35	5	461	1920	792	58.2%	56	10	2	2.1	16.6	6.6
2/1	Avenue Rd Entry Ahead Left	U	A		1	25	-	496	1901	824	60.2%	-	-	-	2.5	18.5	7.1
3/1	Perowne Way Entry Left Right	U	B		1	14	-	248	1748	437	56.8%	-	-	-	2.0	29.1	4.2

C1

PRC for Signalled Lanes (%): 49.5
PRC Over All Lanes (%): 49.5

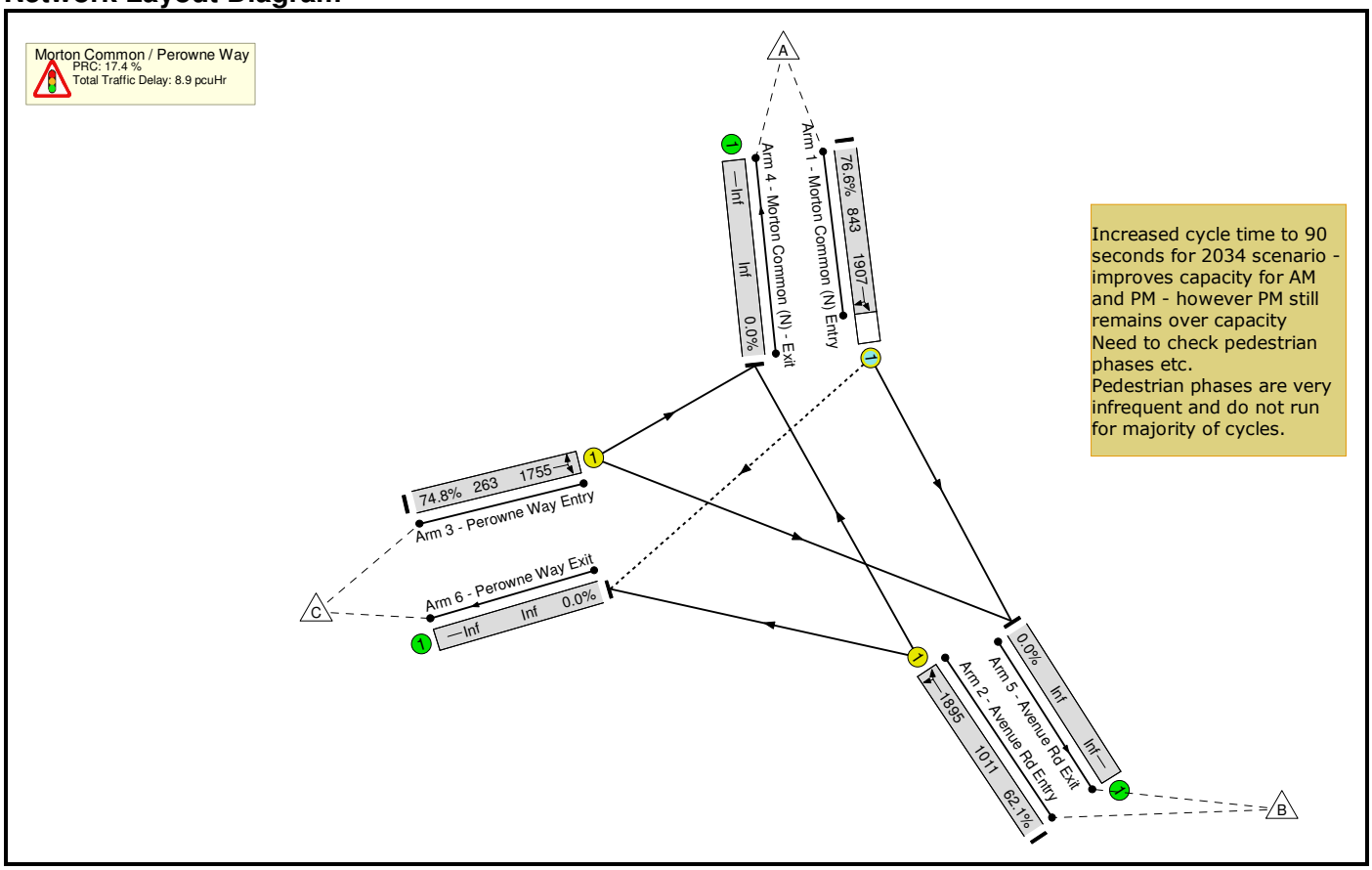
Total Delay for Signalled Lanes (pcuHr): 6.69
Total Delay Over All Lanes(pcuHr): 6.69

Cycle Time (s): 60

Basic Results Summary

Scenario 2: '2017 Base PM' (FG2: '2017 Base 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	-	-	-		-	-	-	-	-	-	**76.6%**	**89**	**38**	**4**	**8.9**	-	-
Morton Common / Perowne Way	-	-	-		-	-	-	-	-	-	**76.6%**	**89**	**38**	**4**	**8.9**	-	-
1/1	Morton Common (N) Entry Ahead Right	O	C	G	1	41	5	646	1907	843	76.6%	89	38	4	3.6	20.0	10.6
2/1	Avenue Rd Entry Ahead Left	U	A		1	31	-	628	1895	1011	62.1%	-	-	-	2.5	14.5	8.0
3/1	Perowne Way Entry Left Right	U	B		1	8	-	197	1755	263	74.8%	-	-	-	2.8	50.5	4.5

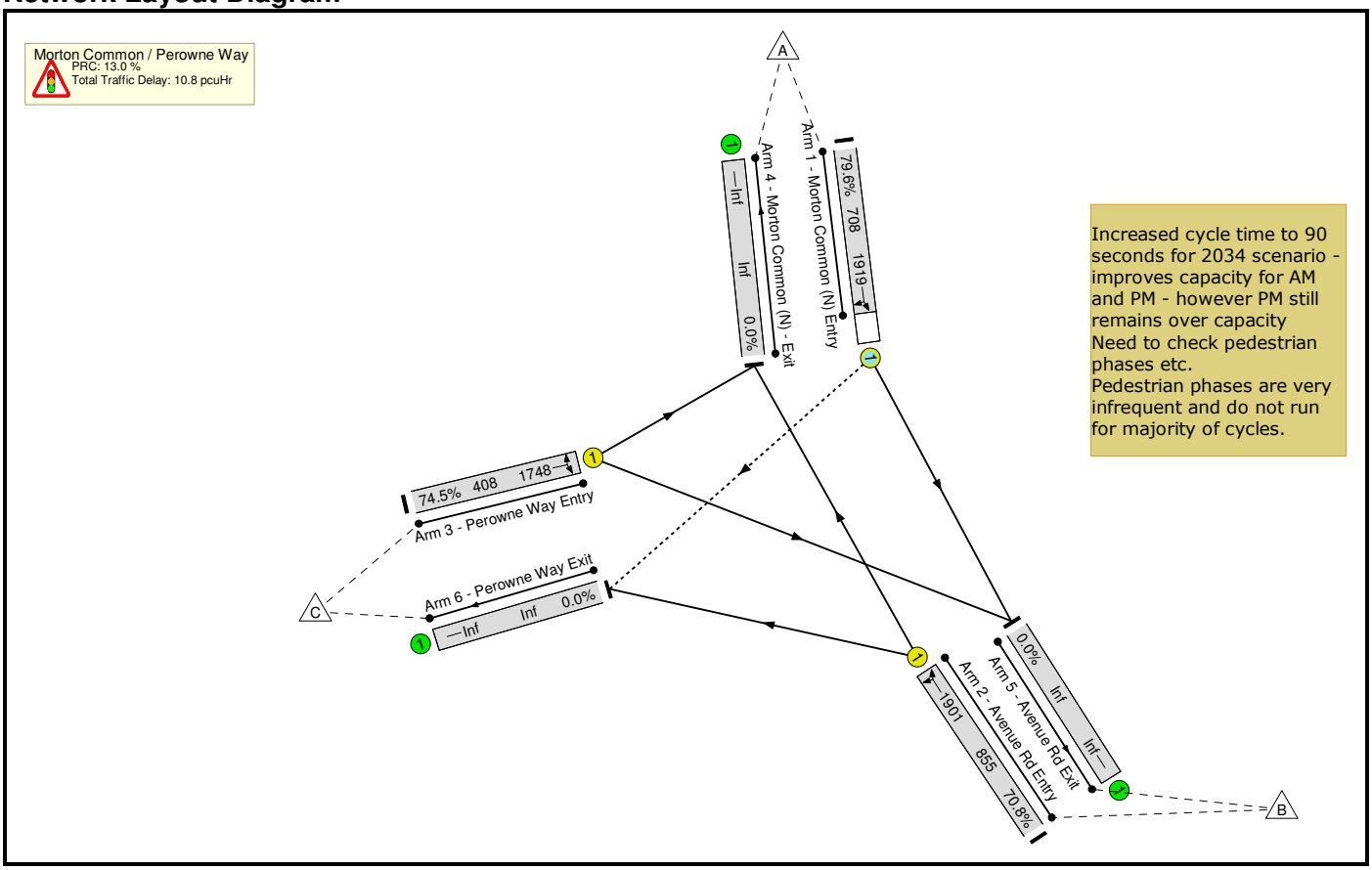
C1 PRC for Signalled Lanes (%): 17.4 Total Delay for Signalled Lanes (pcuHr): 8.87 Cycle Time (s): 60

PRC Over All Lanes (%): 17.4 Total Delay Over All Lanes(pcuHr): 8.87

Basic Results Summary

Scenario 3: '2034 Base AM - 60 secs' (FG3: '2034 Base 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	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**79.6%**	**45**	**36**	**3**	**10.8**	**-**	**-**
Morton Common / Perowne Way	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**79.6%**	**45**	**36**	**3**	**10.8**	**-**	**-**
1/1	Morton Common (N) Entry Ahead Right	O	C	G	1	36	5	564	1919	708	79.6%	45	36	3	4.1	26.3	10.2
2/1	Avenue Rd Entry Ahead Left	U	A		1	26	-	606	1901	855	70.8%	-	-	-	3.4	20.5	9.3
3/1	Perowne Way Entry Left Right	U	B		1	13	-	304	1748	408	74.5%	-	-	-	3.2	38.2	6.1

C1

PRC for Signalled Lanes (%): 13.0
PRC Over All Lanes (%): 13.0

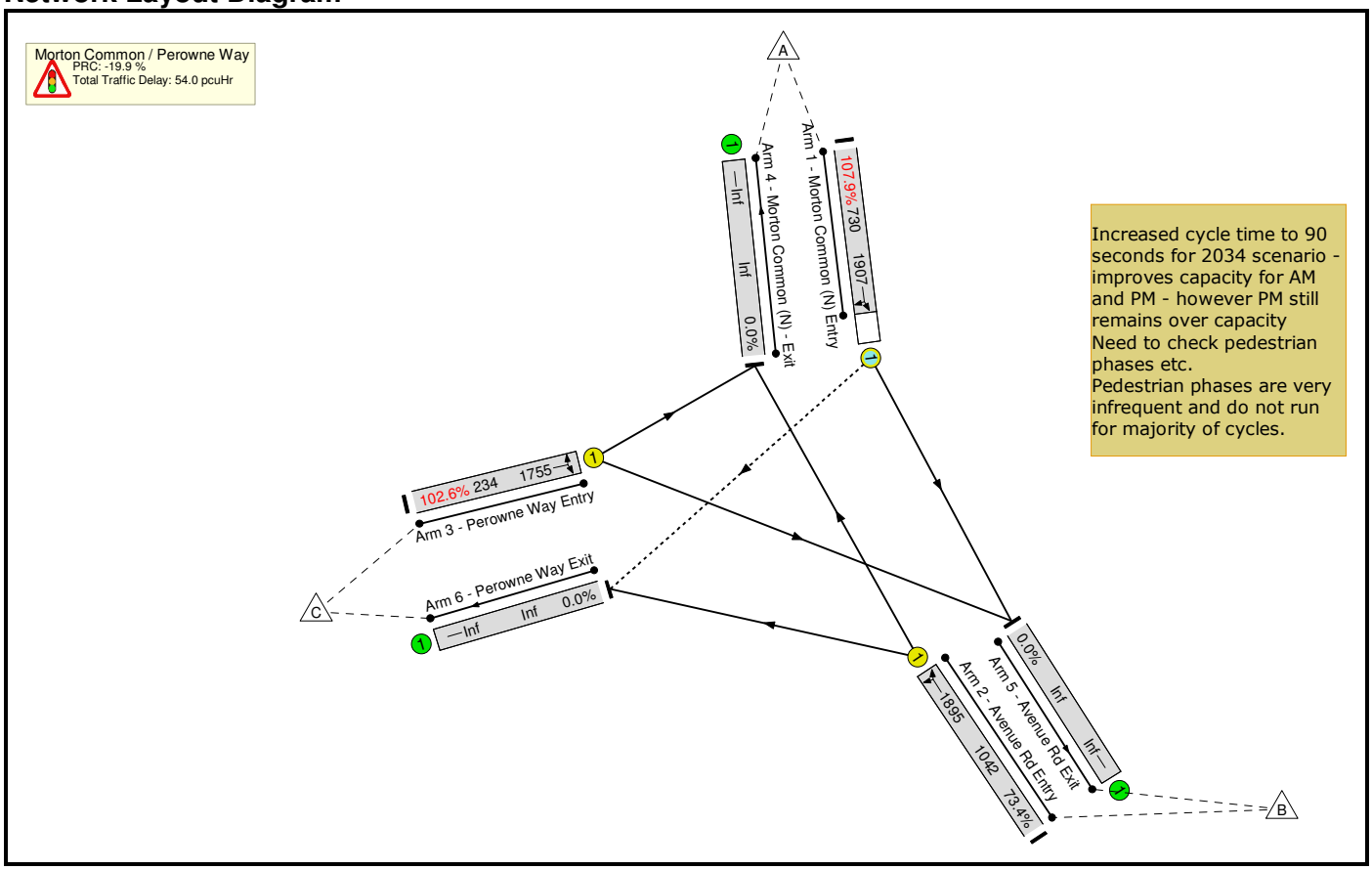
Total Delay for Signalled Lanes (pcuHr): 10.79
Total Delay Over All Lanes(pcuHr): 10.79

Cycle Time (s): 60

Basic Results Summary

Scenario 4: '2034 Base PM - 60 secs' (FG4: '2034 Base 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	-	-	-		-	-	-	-	-	-	**107.9%**	**66**	**58**	**24**	**54.0**	-	-
Morton Common / Perowne Way	-	-	-		-	-	-	-	-	-	**107.9%**	**66**	**58**	**24**	**54.0**	-	-
1/1	Morton Common (N) Entry Ahead Right	O	C	G	1	42	5	787	1907	730	107.9%	66	58	24	39.1	179.0	48.5
2/1	Avenue Rd Entry Ahead Left	U	A		1	32	-	765	1895	1042	73.4%	-	-	-	3.5	16.6	10.9
3/1	Perowne Way Entry Left Right	U	B		1	7	-	240	1755	234	102.6%	-	-	-	11.3	169.9	13.5

C1

PRC for Signalled Lanes (%): -19.9
PRC Over All Lanes (%): -19.9

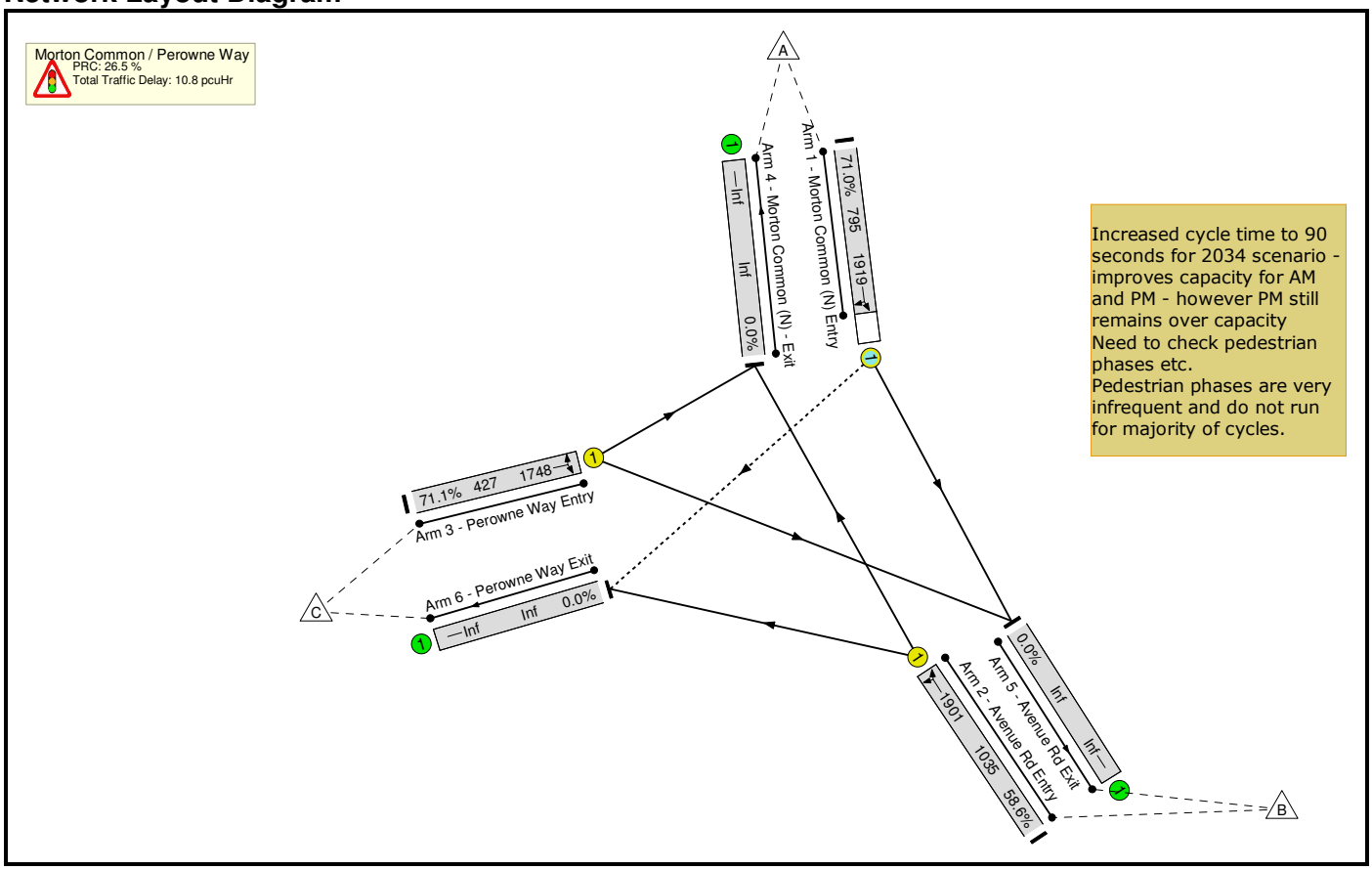
Total Delay for Signalled Lanes (pcuHr): 54.00
Total Delay Over All Lanes(pcuHr): 54.00

Cycle Time (s): 60

Basic Results Summary

Scenario 5: '2034 Base AM - 90 secs' (FG3: '2034 Base 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	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**71.1%**	**74**	**8**	**2**	**10.8**	**-**	**-**
Morton Common / Perowne Way	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**71.1%**	**74**	**8**	**2**	**10.8**	**-**	**-**
1/1	Morton Common (N) Entry Ahead Right	O	C	G	1	58	5	564	1919	795	71.0%	74	8	2	3.9	25.1	12.5
2/1	Avenue Rd Entry Ahead Left	U	A		1	48	-	606	1901	1035	58.6%	-	-	-	3.0	17.9	10.8
3/1	Perowne Way Entry Left Right	U	B		1	21	-	304	1748	427	71.1%	-	-	-	3.8	45.4	8.1

C1

PRC for Signalled Lanes (%): 26.5
PRC Over All Lanes (%): 26.5

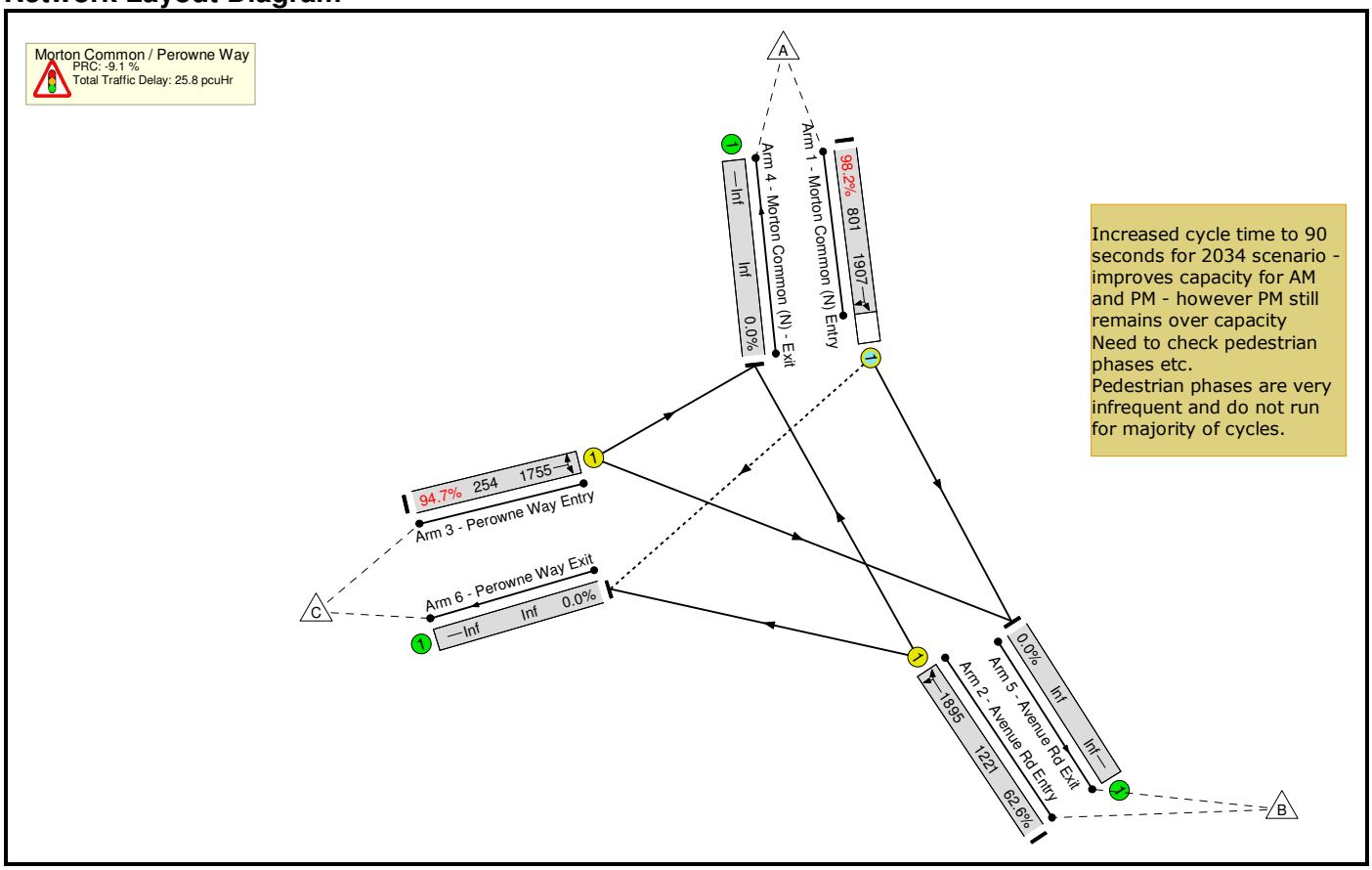
Total Delay for Signalled Lanes (pcuHr): 10.79
Total Delay Over All Lanes(pcuHr): 10.79

Cycle Time (s): 90

Basic Results Summary

Scenario 6: '2034 Base PM - 90 secs' (FG4: '2034 Base 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	-	-	-		-	-	-	-	-	-	**98.2%**	**108**	**39**	**13**	**25.8**	-	-
Morton Common / Perowne Way	-	-	-		-	-	-	-	-	-	**98.2%**	**108**	**39**	**13**	**25.8**	-	-
1/1	Morton Common (N) Entry Ahead Right	O	C	G	1	67	5	787	1907	801	98.2%	108	39	13	15.3	69.9	30.1
2/1	Avenue Rd Entry Ahead Left	U	A		1	57	-	765	1895	1221	62.6%	-	-	-	2.9	13.5	12.1
3/1	Perowne Way Entry Left Right	U	B		1	12	-	240	1755	254	94.7%	-	-	-	7.6	114.3	11.0

C1

PRC for Signalled Lanes (%): -9.1
PRC Over All Lanes (%): -9.1

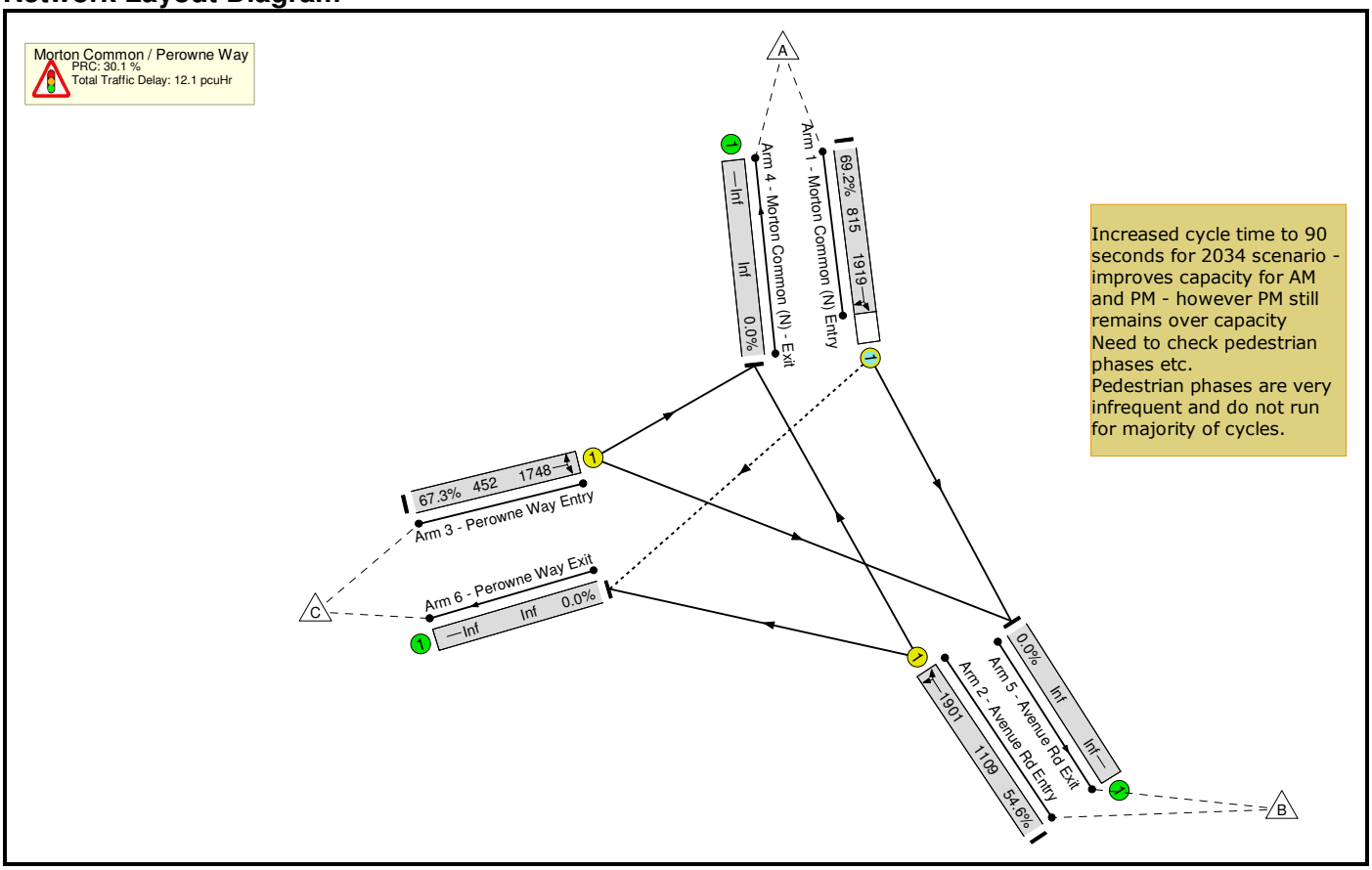
Total Delay for Signalled Lanes (pcuHr): 25.76
Total Delay Over All Lanes(pcuHr): 25.76

Cycle Time (s): 90

Basic Results Summary

Scenario 7: '2034 Base AM - 120 secs' (FG3: '2034 Base AM', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

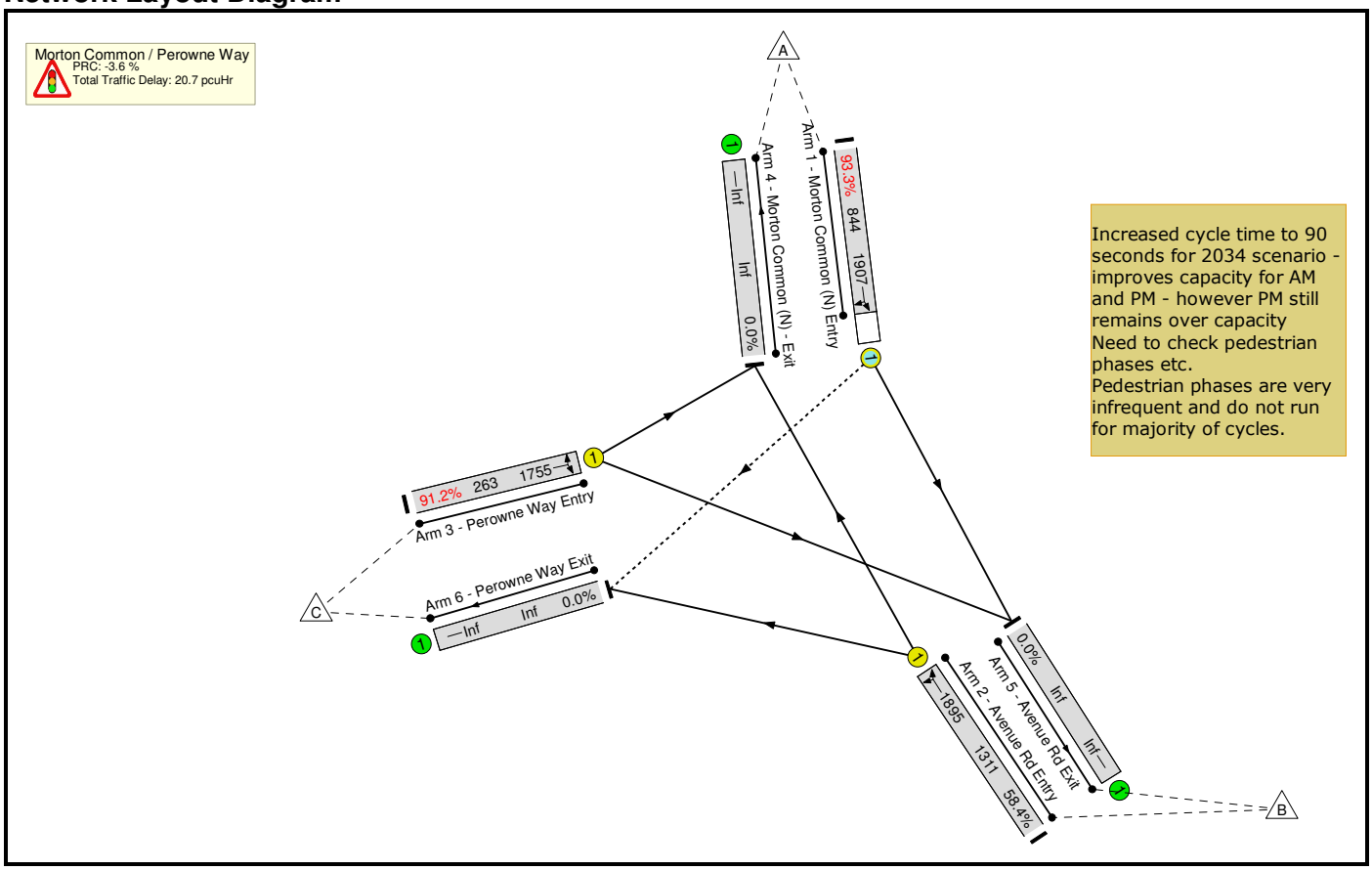
Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**69.2%**	**76**	**6**	**1**	**12.1**	**-**	**-**
Morton Common / Perowne Way	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**69.2%**	**76**	**6**	**1**	**12.1**	**-**	**-**
1/1	Morton Common (N) Entry Ahead Right	O	C	G	1	79	5	564	1919	815	69.2%	76	6	1	4.5	29.0	15.7
2/1	Avenue Rd Entry Ahead Left	U	A		1	69	-	606	1901	1109	54.6%	-	-	-	3.2	18.9	12.9
3/1	Perowne Way Entry Left Right	U	B		1	30	-	304	1748	452	67.3%	-	-	-	4.4	52.0	10.1

C1 PRC for Signalled Lanes (%): 30.1 Total Delay for Signalled Lanes (pcuHr): 12.10 Cycle Time (s): 120
PRC Over All Lanes (%): 30.1 Total Delay Over All Lanes(pcuHr): 12.10

Basic Results Summary

Scenario 8: '2034 Base PM - 120 secs' (FG4: '2034 Base 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	-	-	-		-	-	-	-	-	-	**93.3%**	**130**	**27**	**3**	**20.7**	-	-
Morton Common / Perowne Way	-	-	-		-	-	-	-	-	-	**93.3%**	**130**	**27**	**3**	**20.7**	-	-
1/1	Morton Common (N) Entry Ahead Right	O	C	G	1	92	5	787	1907	844	93.3%	130	27	3	10.7	48.9	30.5
2/1	Avenue Rd Entry Ahead Left	U	A		1	82	-	765	1895	1311	58.4%	-	-	-	2.7	12.9	13.9
3/1	Perowne Way Entry Left Right	U	B		1	17	-	240	1755	263	91.2%	-	-	-	7.2	108.3	11.7

C1

PRC for Signalled Lanes (%): -3.6
PRC Over All Lanes (%): -3.6

Total Delay for Signalled Lanes (pcuHr): 20.65
Total Delay Over All Lanes(pcuHr): 20.65

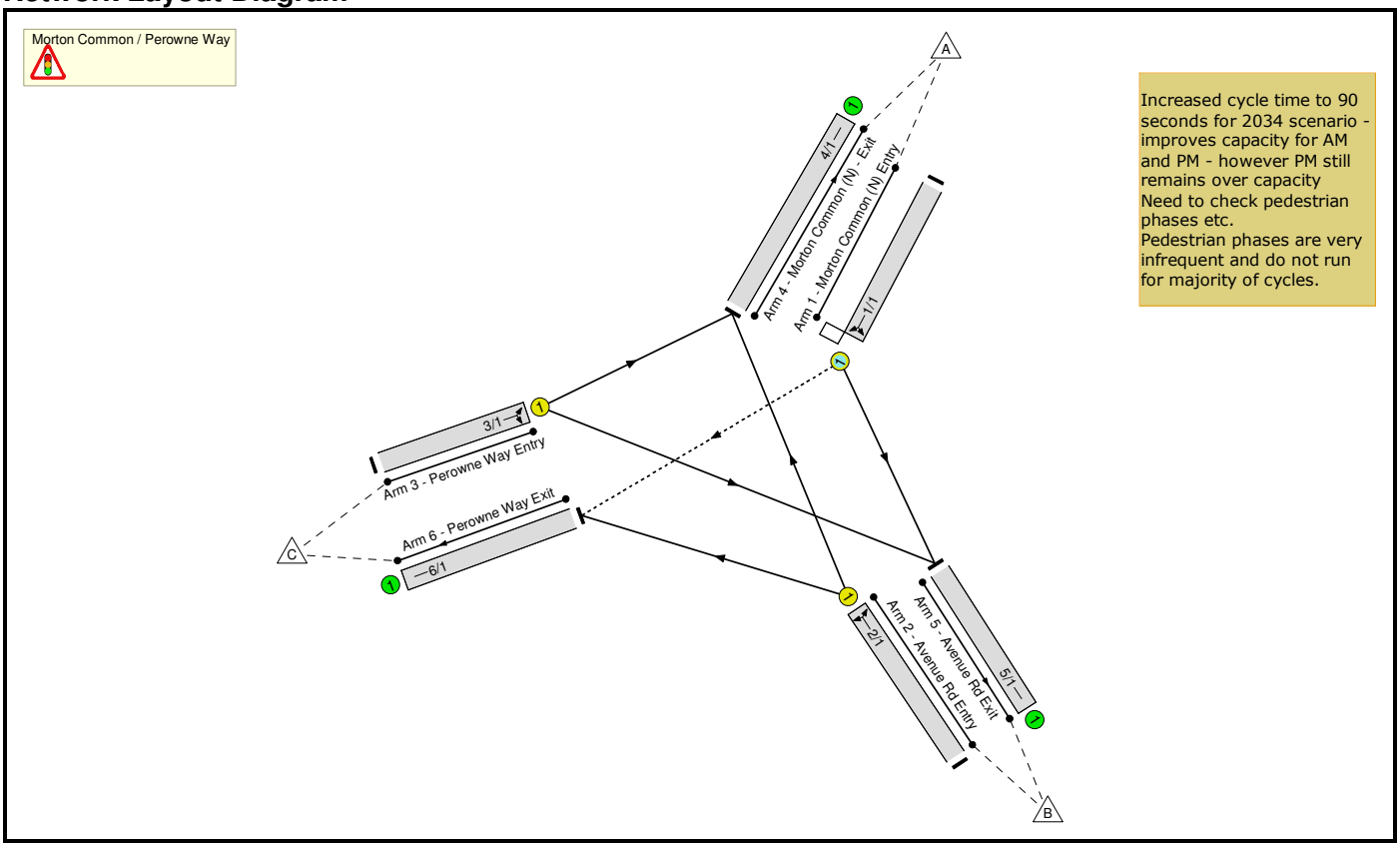
Cycle Time (s): 120

Full Input Data And Results

User and Project Details

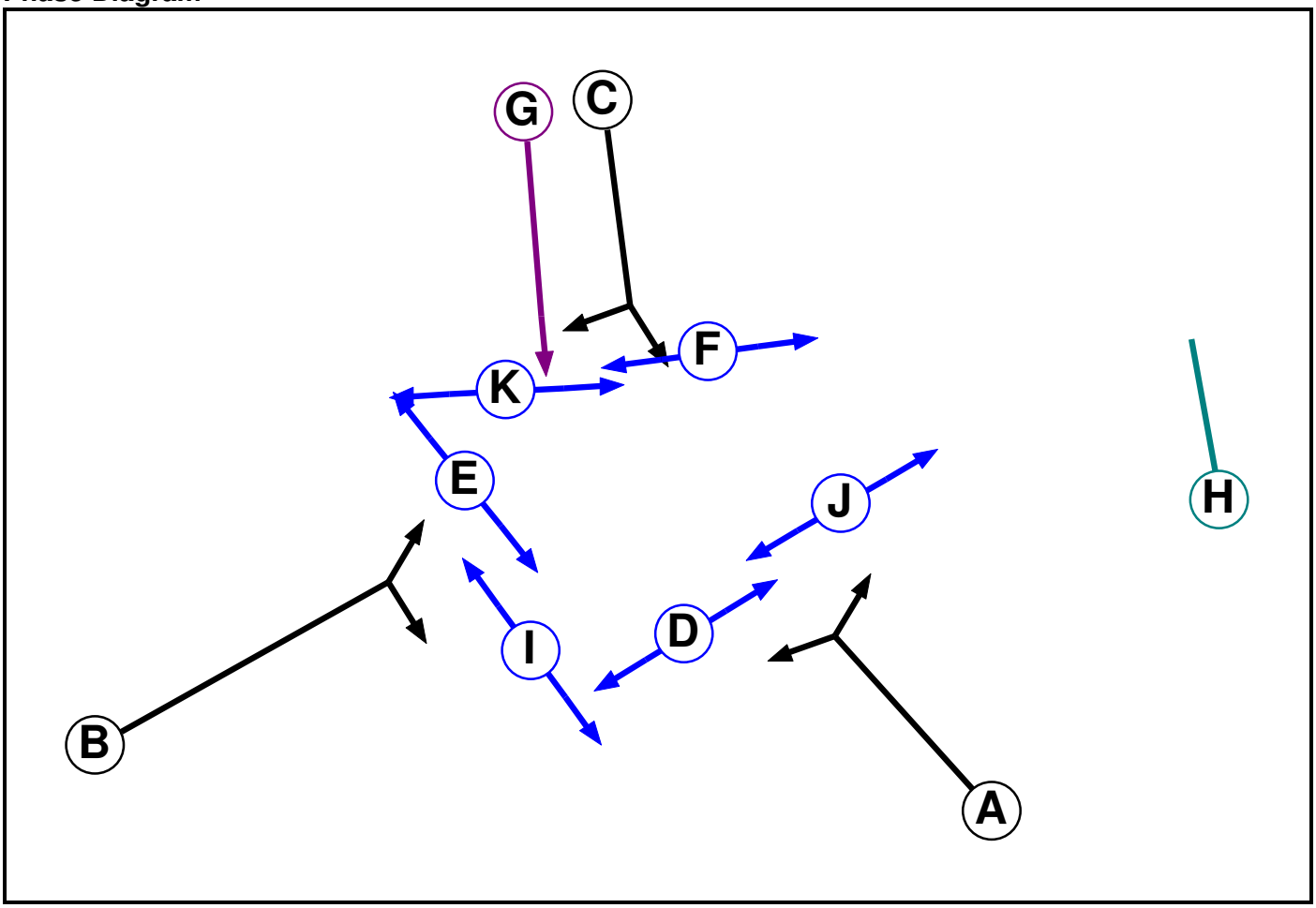
Project:	**A090129-99 IoW Junction Assessment and Design**
Title:	
Location:	
Additional detail:	
File name:	Morton Common - Perowne Way - Proposed Junction (Option 2).lsg3x
Author:	Jack Smith
Company:	WYG
Address:	11th Floor, 1 Angel Court, London, EC2R 7HJ

Network Layout Diagram



Full Input Data And Results

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	7
B	Traffic		7	7
C	Traffic		7	7
D	Pedestrian		6	6
E	Pedestrian		6	6
F	Pedestrian		6	6
G	Ind. Arrow	C	5	5
H	Dummy		6	6
I	Pedestrian		7	7
J	Pedestrian		7	7
K	Pedestrian		7	7

Full Input Data And Results

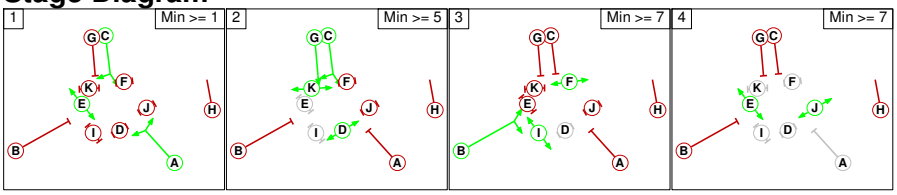
Phase Intergreens Matrix

Terminating Phase \ Starting Phase	A	B	C	D	E	F	G	H	I	J	K
A		5	-	5	-	-	5	2	7	-	7
B	6		7	-	5	-	7	2	-	9	8
C	-	5		-	-	5	-	2	-	6	-
D	8	-	-		-	-	-	2	-	-	-
E	-	5	-	-		-	-	2	-	-	-
F	-	-	5	-	-		5	2	-	-	-
G	6	5	-	-	-	5		2	-	6	-
H	2	2	2	2	2	2	2		-	-	-
I	7	-	-	-	-	-	-	-		-	-
J	-	8	8	-	-	-	8	-	-		-
K	7	7	-	-	-	-	-	-	-	-	

Phases in Stage

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

Stage Diagram



Phase Delays

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

Prohibited Stage Change

From Stage \ To Stage	1	2	3	4
1		7	7	6
2	8		7	6
3	7	8		9
4	8	8	8	

Full Input Data And Results

Give-Way Lane Input Data

Junction: Morton Common / Perowne Way

Lane	Movement	Max Flow when Giving Way (PCU/Hr)	Min Flow when Giving Way (PCU/Hr)	Opposing Lane	Opp. Lane Coeff.	Opp. Mvmnts.	Right Turn Storage (PCU)	Non-Blocking Storage (PCU)	RTF	Right Turn Move up (s)	Max Turns in Intergreen (PCU)
1/1 (Morton Common (N) Entry)	6/1 (Ahead)	1439	0	2/1	1.09	All	1.00	1.00	0.50	1	2.00

Full Input Data And Results

Lane Input Data

Junction: Morton Common / Perowne Way												
Lane	**Lane Type**	**Phases**	**Start Disp.**	**End Disp.**	**Physical Length (PCU)**	**Sat Flow Type**	**Def User Saturation Flow (PCU/Hr)**	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Turns**	**Turning Radius (m)**
1/1 (Morton Common (N) Entry)	O	C G	2	3	60.0	Geom	-	2.50	0.00	Y	Arm 5 Left	Inf
											Arm 6 Ahead	12.00
2/1 (Avenue Rd Entry)	U	A	2	3	30.0	Geom	-	3.70	0.00	Y	Arm 4 Right	Inf
											Arm 6 Left	15.00
3/1 (Perowne Way Entry)	U	B	2	3	60.0	Geom	-	3.00	0.00	Y	Arm 4 Ahead	20.00
											Arm 5 Right	11.00
4/1 (Morton Common (N) - Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
5/1 (Avenue Rd Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
6/1 (Perowne Way Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2017 Base AM'	08:00	09:00	01:00	
2: '2017 Base PM'	17:00	18:00	01:00	
3: '2034 Base AM'	08:00	09:00	01:00	
4: '2034 Base PM'	17:00	18:00	01:00	

Scenario 1: '2017 Base AM' (FG1: '2017 Base AM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	393	68	461
	B	441	0	55	496
	C	123	125	0	248
	Tot.	564	518	123	1205

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 1: 2017 Base AM
Junction: Morton Common / Perowne Way	
1/1	461
2/1	496
3/1	248
4/1	564
5/1	518
6/1	123

Lane Saturation Flows

Junction: Morton Common / Perowne Way								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (Morton Common (N) Entry)	2.50	0.00	Y	Arm 5 Left	Inf	85.2 %	1831	1831
				Arm 6 Ahead	12.00	14.8 %		
2/1 (Avenue Rd Entry)	3.70	0.00	Y	Arm 4 Right	Inf	88.9 %	1963	1963
				Arm 6 Left	15.00	11.1 %		
3/1 (Perowne Way Entry)	3.00	0.00	Y	Arm 4 Ahead	20.00	49.6 %	1732	1732
				Arm 5 Right	11.00	50.4 %		
4/1 (Morton Common (N) - Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Avenue Rd Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Perowne Way Exit Lane 1)	Infinite Saturation Flow						Inf	Inf

Scenario 2: '2017 Base PM' (FG2: '2017 Base PM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	515	131	646
	B	541	0	87	628
	C	118	79	0	197
	Tot.	659	594	218	1471

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 2: 2017 Base PM
Junction: Morton Common / Perowne Way	
1/1	646
2/1	628
3/1	197
4/1	659
5/1	594
6/1	218

Lane Saturation Flows

Junction: Morton Common / Perowne Way								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (Morton Common (N) Entry)	2.50	0.00	Y	Arm 5 Left	Inf	79.7 %	1819	1819
				Arm 6 Ahead	12.00	20.3 %		
2/1 (Avenue Rd Entry)	3.70	0.00	Y	Arm 4 Right	Inf	86.1 %	1958	1958
				Arm 6 Left	15.00	13.9 %		
3/1 (Perowne Way Entry)	3.00	0.00	Y	Arm 4 Ahead	20.00	59.9 %	1742	1742
				Arm 5 Right	11.00	40.1 %		
4/1 (Morton Common (N) - Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Avenue Rd Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Perowne Way Exit Lane 1)	Infinite Saturation Flow						Inf	Inf

Scenario 3: '2034 Base AM - 60 secs' (FG3: '2034 Base AM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	480	84	564
	B	539	0	67	606
	C	151	153	0	304
	Tot.	690	633	151	1474

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 3: 2034 Base AM - 60 secs
Junction: Morton Common / Perowne Way	
1/1	564
2/1	606
3/1	304
4/1	690
5/1	633
6/1	151

Lane Saturation Flows

Junction: Morton Common / Perowne Way								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (Morton Common (N) Entry)	2.50	0.00	Y	Arm 5 Left	Inf	85.1 %	1831	1831
				Arm 6 Ahead	12.00	14.9 %		
2/1 (Avenue Rd Entry)	3.70	0.00	Y	Arm 4 Right	Inf	88.9 %	1963	1963
				Arm 6 Left	15.00	11.1 %		
3/1 (Perowne Way Entry)	3.00	0.00	Y	Arm 4 Ahead	20.00	49.7 %	1732	1732
				Arm 5 Right	11.00	50.3 %		
4/1 (Morton Common (N) - Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Avenue Rd Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Perowne Way Exit Lane 1)	Infinite Saturation Flow						Inf	Inf

Scenario 4: '2034 Base PM - 60 secs' (FG4: '2034 Base PM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	627	160	787
	B	659	0	106	765
	C	144	96	0	240
	Tot.	803	723	266	1792

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 4: 2034 Base PM - 60 secs
Junction: Morton Common / Perowne Way	
1/1	787
2/1	765
3/1	240
4/1	803
5/1	723
6/1	266

Lane Saturation Flows

Junction: Morton Common / Perowne Way								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (Morton Common (N) Entry)	2.50	0.00	Y	Arm 5 Left	Inf	79.7 %	1819	1819
				Arm 6 Ahead	12.00	20.3 %		
2/1 (Avenue Rd Entry)	3.70	0.00	Y	Arm 4 Right	Inf	86.1 %	1958	1958
				Arm 6 Left	15.00	13.9 %		
3/1 (Perowne Way Entry)	3.00	0.00	Y	Arm 4 Ahead	20.00	60.0 %	1742	1742
				Arm 5 Right	11.00	40.0 %		
4/1 (Morton Common (N) - Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Avenue Rd Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Perowne Way Exit Lane 1)	Infinite Saturation Flow						Inf	Inf

Scenario 5: '2034 Base AM - 90 secs' (FG3: '2034 Base AM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	480	84	564
	B	539	0	67	606
	C	151	153	0	304
	Tot.	690	633	151	1474

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 5: 2034 Base AM - 90 secs
Junction: Morton Common / Perowne Way	
1/1	564
2/1	606
3/1	304
4/1	690
5/1	633
6/1	151

Lane Saturation Flows

Junction: Morton Common / Perowne Way								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (Morton Common (N) Entry)	2.50	0.00	Y	Arm 5 Left	Inf	85.1 %	1831	1831
				Arm 6 Ahead	12.00	14.9 %		
2/1 (Avenue Rd Entry)	3.70	0.00	Y	Arm 4 Right	Inf	88.9 %	1963	1963
				Arm 6 Left	15.00	11.1 %		
3/1 (Perowne Way Entry)	3.00	0.00	Y	Arm 4 Ahead	20.00	49.7 %	1732	1732
				Arm 5 Right	11.00	50.3 %		
4/1 (Morton Common (N) - Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Avenue Rd Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Perowne Way Exit Lane 1)	Infinite Saturation Flow						Inf	Inf

Scenario 6: '2034 Base PM - 90 secs' (FG4: '2034 Base PM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	627	160	787
	B	659	0	106	765
	C	144	96	0	240
	Tot.	803	723	266	1792

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 6: 2034 Base PM - 90 secs
Junction: Morton Common / Perowne Way	
1/1	787
2/1	765
3/1	240
4/1	803
5/1	723
6/1	266

Lane Saturation Flows

Junction: Morton Common / Perowne Way								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (Morton Common (N) Entry)	2.50	0.00	Y	Arm 5 Left	Inf	79.7 %	1819	1819
				Arm 6 Ahead	12.00	20.3 %		
2/1 (Avenue Rd Entry)	3.70	0.00	Y	Arm 4 Right	Inf	86.1 %	1958	1958
				Arm 6 Left	15.00	13.9 %		
3/1 (Perowne Way Entry)	3.00	0.00	Y	Arm 4 Ahead	20.00	60.0 %	1742	1742
				Arm 5 Right	11.00	40.0 %		
4/1 (Morton Common (N) - Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Avenue Rd Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Perowne Way Exit Lane 1)	Infinite Saturation Flow						Inf	Inf

Scenario 7: '2034 Base AM - 120 secs' (FG3: '2034 Base AM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	480	84	564
	B	539	0	67	606
	C	151	153	0	304
	Tot.	690	633	151	1474

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 7: 2034 Base AM - 120 secs
Junction: Morton Common / Perowne Way	
1/1	564
2/1	606
3/1	304
4/1	690
5/1	633
6/1	151

Lane Saturation Flows

Junction: Morton Common / Perowne Way								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (Morton Common (N) Entry)	2.50	0.00	Y	Arm 5 Left	Inf	85.1 %	1831	1831
				Arm 6 Ahead	12.00	14.9 %		
2/1 (Avenue Rd Entry)	3.70	0.00	Y	Arm 4 Right	Inf	88.9 %	1963	1963
				Arm 6 Left	15.00	11.1 %		
3/1 (Perowne Way Entry)	3.00	0.00	Y	Arm 4 Ahead	20.00	49.7 %	1732	1732
				Arm 5 Right	11.00	50.3 %		
4/1 (Morton Common (N) - Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Avenue Rd Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Perowne Way Exit Lane 1)	Infinite Saturation Flow						Inf	Inf

Scenario 8: '2034 Base PM - 120 secs' (FG4: '2034 Base PM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	627	160	787
	B	659	0	106	765
	C	144	96	0	240
	Tot.	803	723	266	1792

Full Input Data And Results

Traffic Lane Flows

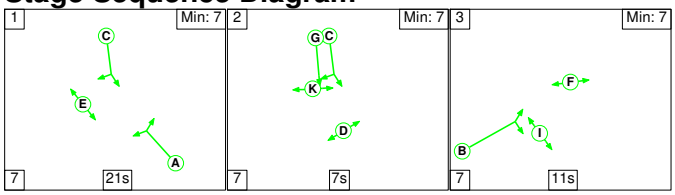
Lane	Scenario 8: 2034 Base PM - 120 secs
Junction: Morton Common / Perowne Way	
1/1	787
2/1	765
3/1	240
4/1	803
5/1	723
6/1	266

Lane Saturation Flows

Junction: Morton Common / Perowne Way								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (Morton Common (N) Entry)	2.50	0.00	Y	Arm 5 Left	Inf	79.7 %	1819	1819
				Arm 6 Ahead	12.00	20.3 %		
2/1 (Avenue Rd Entry)	3.70	0.00	Y	Arm 4 Right	Inf	86.1 %	1958	1958
				Arm 6 Left	15.00	13.9 %		
3/1 (Perowne Way Entry)	3.00	0.00	Y	Arm 4 Ahead	20.00	60.0 %	1742	1742
				Arm 5 Right	11.00	40.0 %		
4/1 (Morton Common (N) - Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Avenue Rd Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Perowne Way Exit Lane 1)	Infinite Saturation Flow						Inf	Inf

Scenario 1: '2017 Base AM' (FG1: '2017 Base AM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

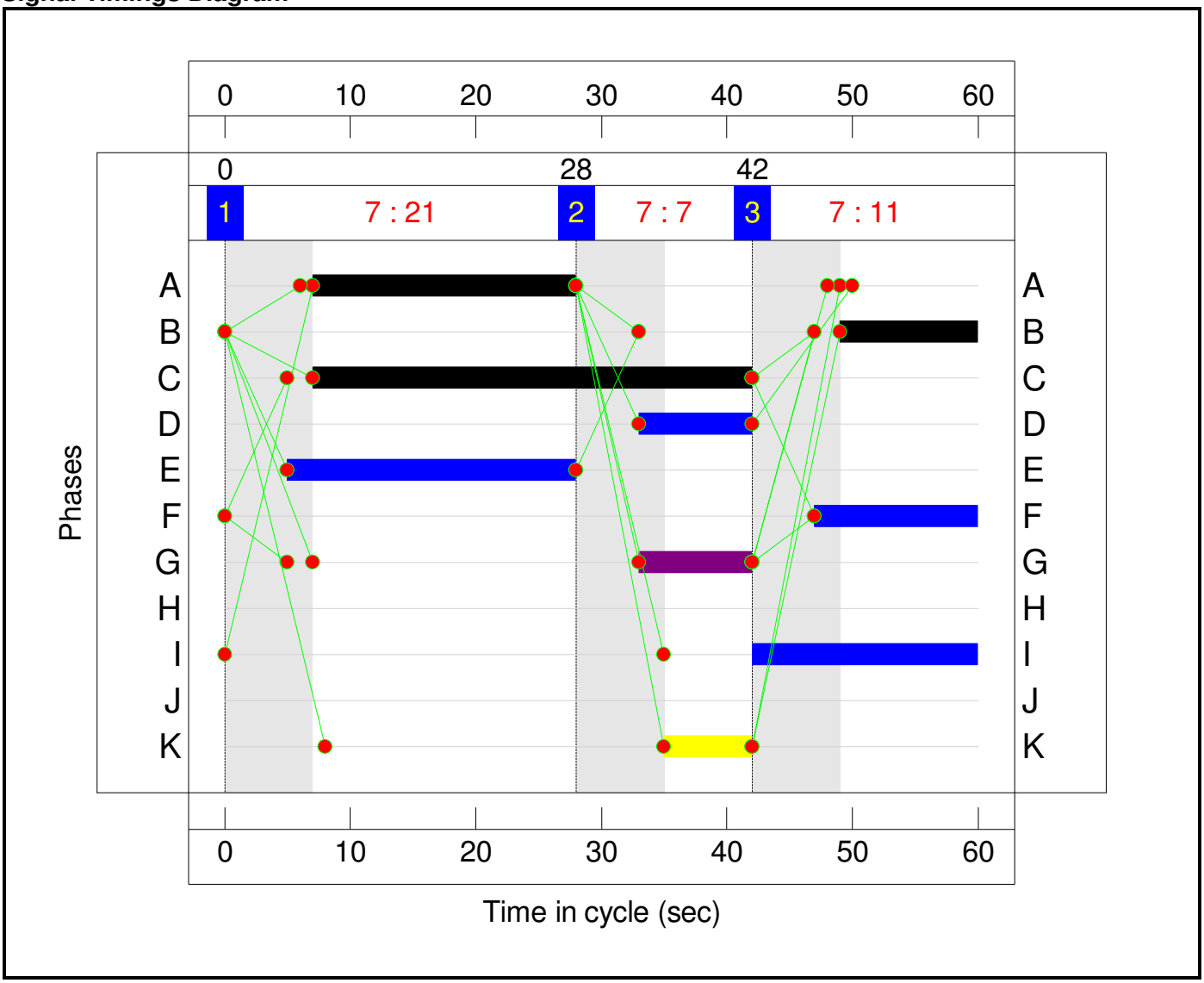


Stage Timings

Stage	1	2	3
Duration	21	7	11
Change Point	0	28	42

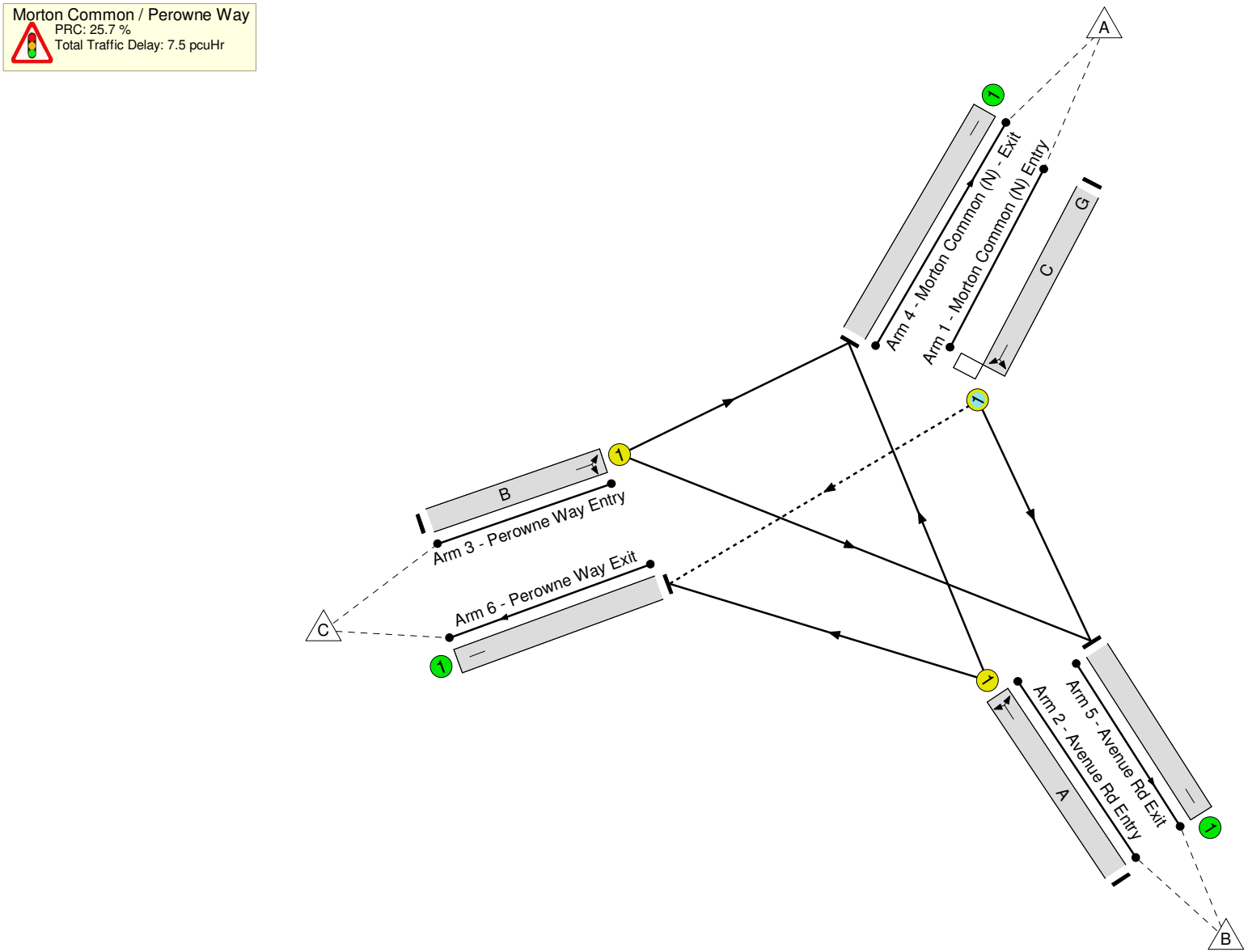
Full Input Data And Results

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Increased cycle time to 90 seconds for 2034 scenario - improves capacity for AM and PM - however PM still remains over capacity
Need to check pedestrian phases etc.
Pedestrian phases are very infrequent and do not run for majority of cycles.

Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**71.6%**
Morton Common / Perowne Way	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**71.6%**
1/1	Morton Common (N) Entry Left Ahead	O	N/A	N/A	C	G	1	35	9	461	1831	1013	45.5%
2/1	Avenue Rd Entry Right Left	U	N/A	N/A	A		1	21	-	496	1963	720	68.9%
3/1	Perowne Way Entry Ahead Right	U	N/A	N/A	B		1	11	-	248	1732	346	71.6%
4/1	Morton Common (N) - Exit	U	N/A	N/A	-		-	-	-	564	Inf	Inf	0.0%
5/1	Avenue Rd Exit	U	N/A	N/A	-		-	-	-	518	Inf	Inf	0.0%
6/1	Perowne Way Exit	U	N/A	N/A	-		-	-	-	123	Inf	Inf	0.0%

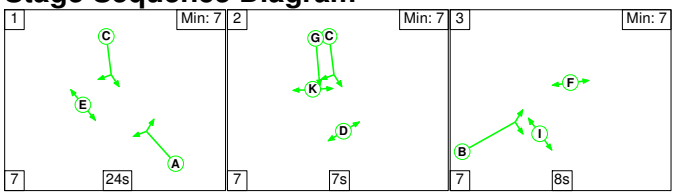
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**53**	**14**	**1**	**4.6**	**2.7**	**0.1**	**7.5**	**-**	**-**	**-**	**-**
Morton Common / Perowne Way	**-**	**-**	**53**	**14**	**1**	**4.6**	**2.7**	**0.1**	**7.5**	**-**	**-**	**-**	**-**
1/1	461	461	53	14	1	0.8	0.4	0.1	1.4	10.6	4.1	0.4	4.5
2/1	496	496	-	-	-	2.2	1.1	-	3.3	24.1	6.9	1.1	8.0
3/1	248	248	-	-	-	1.5	1.2	-	2.8	40.3	3.9	1.2	5.1
4/1	564	564	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	518	518	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	123	123	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 25.7 Total Delay for Signalled Lanes (pcuHr): 7.45 Cycle Time (s): 60
PRC Over All Lanes (%): 25.7 Total Delay Over All Lanes(pcuHr): 7.45

Full Input Data And Results

Scenario 2: '2017 Base PM' (FG2: '2017 Base PM', Plan 1: 'Network Control Plan 1')

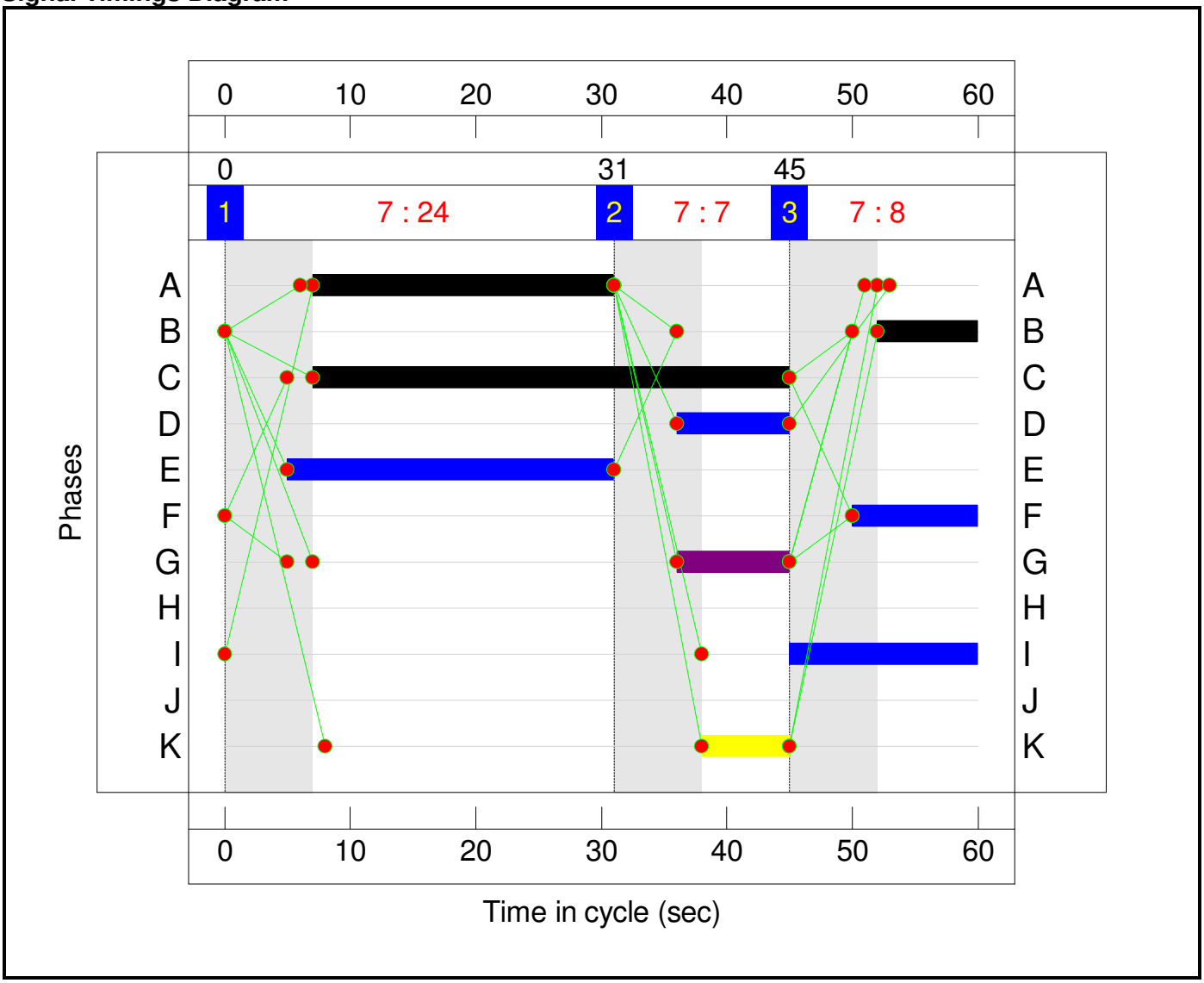
Stage Sequence Diagram



Stage Timings

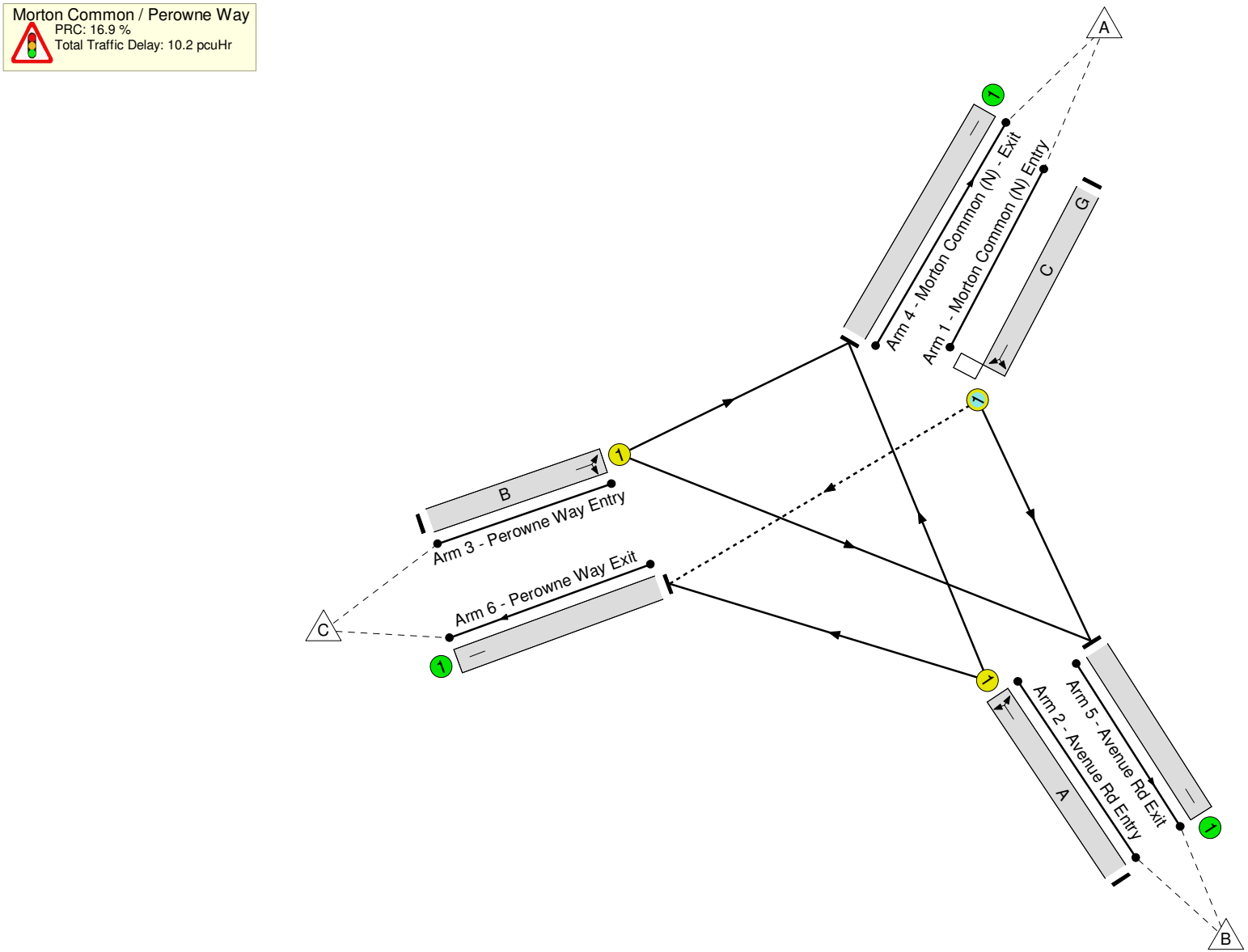
Stage	1	2	3
Duration	24	7	8
Change Point	0	31	45

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Increased cycle time to 90 seconds for 2034 scenario - improves capacity for AM and PM - however PM still remains over capacity
Need to check pedestrian phases etc.
Pedestrian phases are very infrequent and do not run for majority of cycles.

Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**77.0%**
Morton Common / Perowne Way	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**77.0%**
1/1	Morton Common (N) Entry Left Ahead	O	N/A	N/A	C	G	1	38	9	646	1819	871	74.2%
2/1	Avenue Rd Entry Right Left	U	N/A	N/A	A		1	24	-	628	1958	816	77.0%
3/1	Perowne Way Entry Ahead Right	U	N/A	N/A	B		1	8	-	197	1742	261	75.4%
4/1	Morton Common (N) - Exit	U	N/A	N/A	-		-	-	-	659	Inf	Inf	0.0%
5/1	Avenue Rd Exit	U	N/A	N/A	-		-	-	-	594	Inf	Inf	0.0%
6/1	Perowne Way Exit	U	N/A	N/A	-		-	-	-	218	Inf	Inf	0.0%

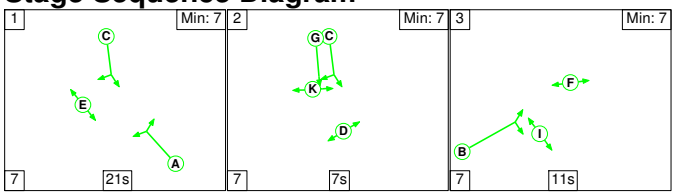
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**97**	**32**	**2**	**5.4**	**4.5**	**0.3**	**10.2**	**-**	**-**	**-**	**-**
Morton Common / Perowne Way	**-**	**-**	**97**	**32**	**2**	**5.4**	**4.5**	**0.3**	**10.2**	**-**	**-**	**-**	**-**
1/1	646	646	97	32	2	1.4	1.4	0.3	3.1	17.4	8.6	1.4	10.0
2/1	628	628	-	-	-	2.6	1.6	-	4.3	24.5	8.9	1.6	10.5
3/1	197	197	-	-	-	1.3	1.5	-	2.8	51.2	3.1	1.5	4.6
4/1	659	659	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	594	594	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	218	218	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 16.9 Total Delay for Signalled Lanes (pcuHr): 10.19 Cycle Time (s): 60
PRC Over All Lanes (%): 16.9 Total Delay Over All Lanes(pcuHr): 10.19

Full Input Data And Results

Scenario 3: '2034 Base AM - 60 secs' (FG3: '2034 Base AM', Plan 1: 'Network Control Plan 1')

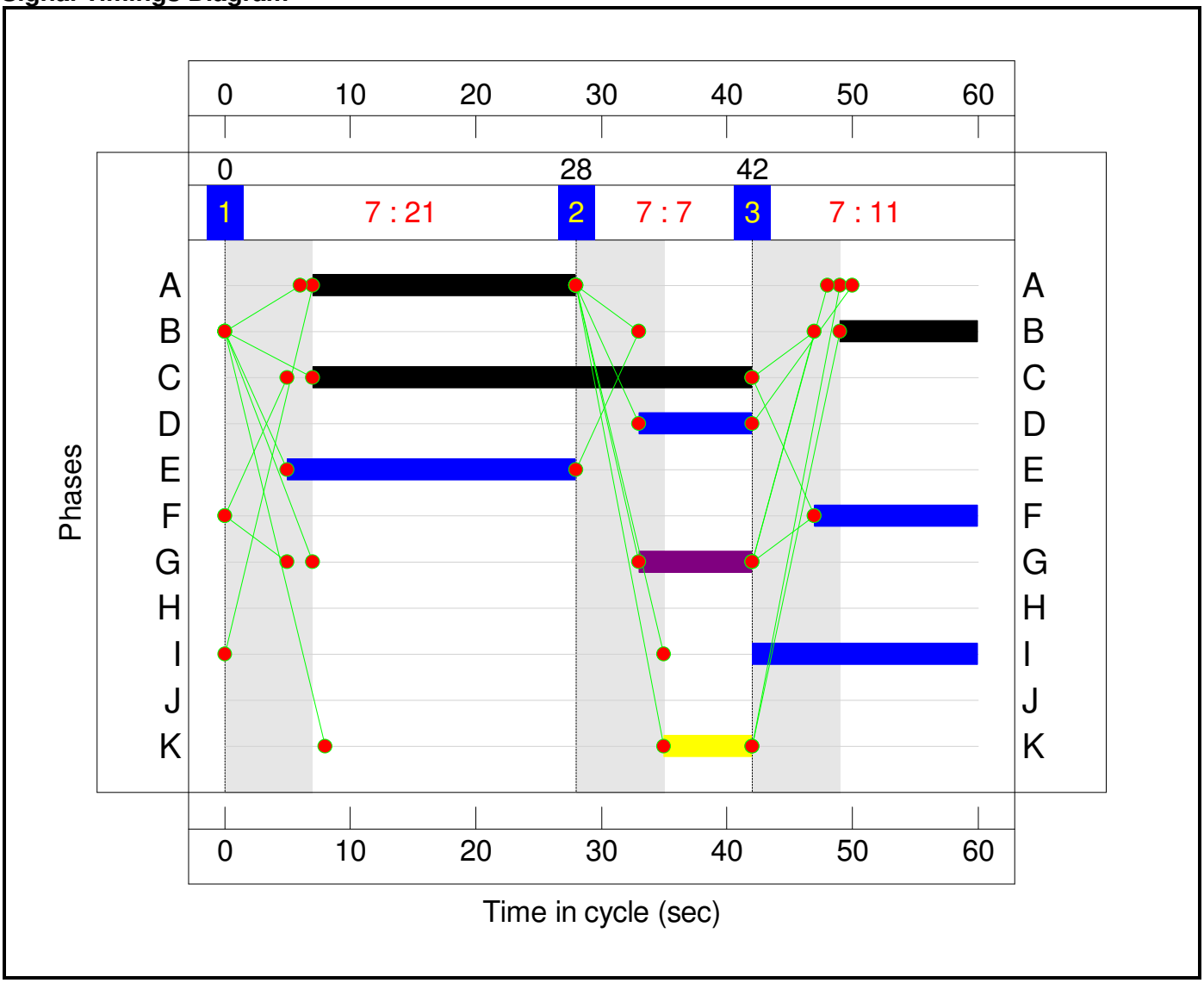
Stage Sequence Diagram



Stage Timings

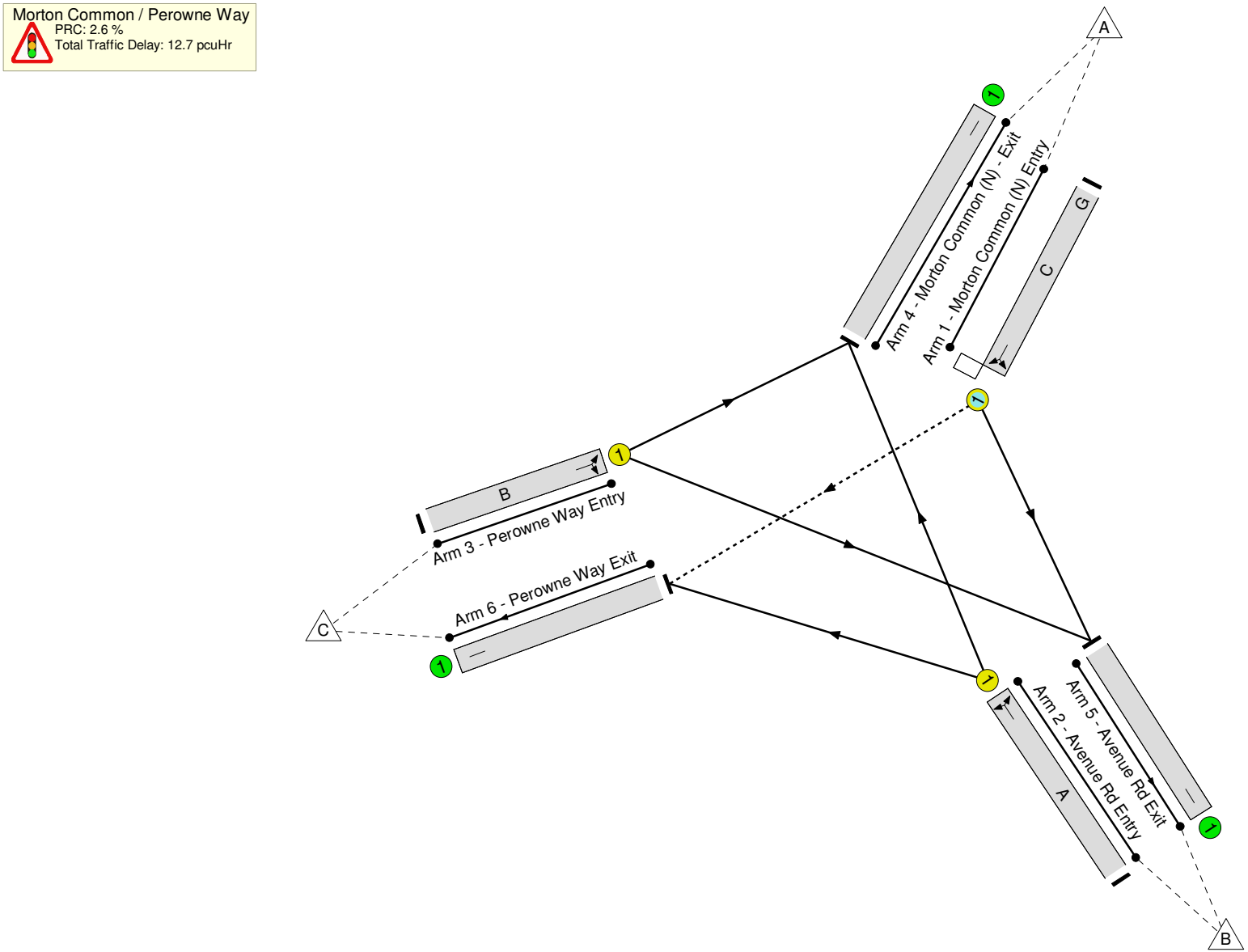
Stage	1	2	3
Duration	21	7	11
Change Point	0	28	42

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Increased cycle time to 90 seconds for 2034 scenario - improves capacity for AM and PM - however PM still remains over capacity
Need to check pedestrian phases etc.
Pedestrian phases are very infrequent and do not run for majority of cycles.

Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**87.8%**
Morton Common / Perowne Way	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**87.8%**
1/1	Morton Common (N) Entry Left Ahead	O	N/A	N/A	C	G	1	35	9	564	1831	890	63.3%
2/1	Avenue Rd Entry Right Left	U	N/A	N/A	A		1	21	-	606	1963	720	84.2%
3/1	Perowne Way Entry Ahead Right	U	N/A	N/A	B		1	11	-	304	1732	346	87.8%
4/1	Morton Common (N) - Exit	U	N/A	N/A	-		-	-	-	690	Inf	Inf	0.0%
5/1	Avenue Rd Exit	U	N/A	N/A	-		-	-	-	633	Inf	Inf	0.0%
6/1	Perowne Way Exit	U	N/A	N/A	-		-	-	-	151	Inf	Inf	0.0%

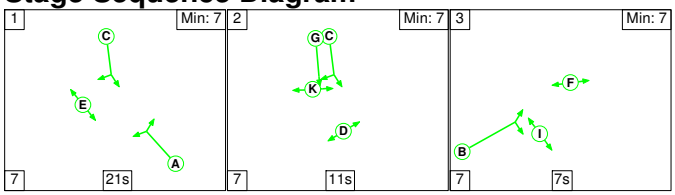
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**65**	**18**	**1**	**6.0**	**6.5**	**0.2**	**12.7**	**-**	**-**	**-**	**-**
Morton Common / Perowne Way	**-**	**-**	**65**	**18**	**1**	**6.0**	**6.5**	**0.2**	**12.7**	**-**	**-**	**-**	**-**
1/1	564	564	65	18	1	1.1	0.9	0.2	2.2	13.9	5.5	0.9	6.3
2/1	606	606	-	-	-	2.9	2.5	-	5.5	32.6	9.1	2.5	11.6
3/1	304	304	-	-	-	2.0	3.1	-	5.1	60.3	4.9	3.1	8.0
4/1	690	690	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	633	633	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	151	151	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 2.6 Total Delay for Signalled Lanes (pcuHr): 12.75 Cycle Time (s): 60
PRC Over All Lanes (%): 2.6 Total Delay Over All Lanes(pcuHr): 12.75

Full Input Data And Results

Scenario 4: '2034 Base PM - 60 secs' (FG4: '2034 Base PM', Plan 1: 'Network Control Plan 1')

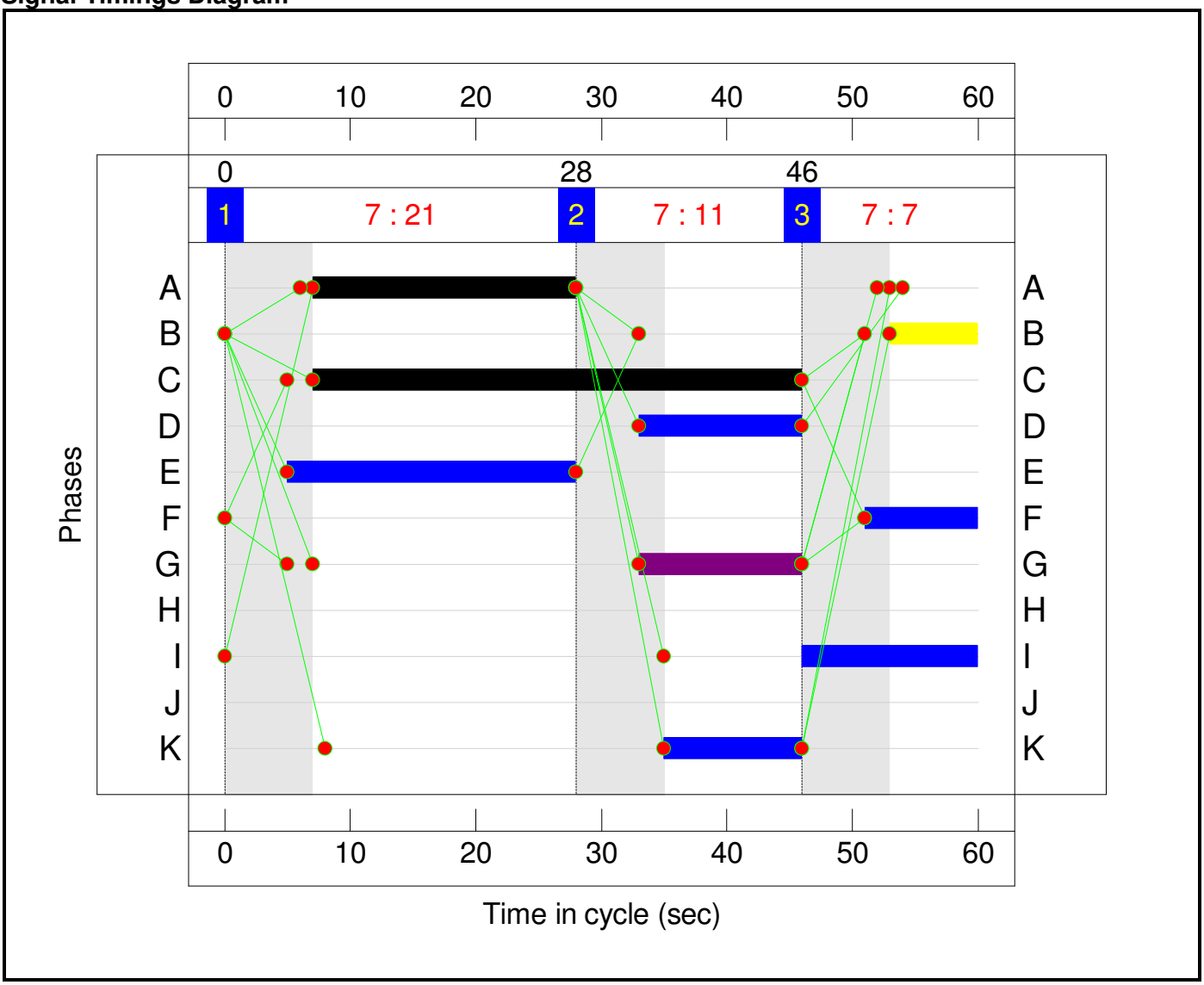
Stage Sequence Diagram



Stage Timings

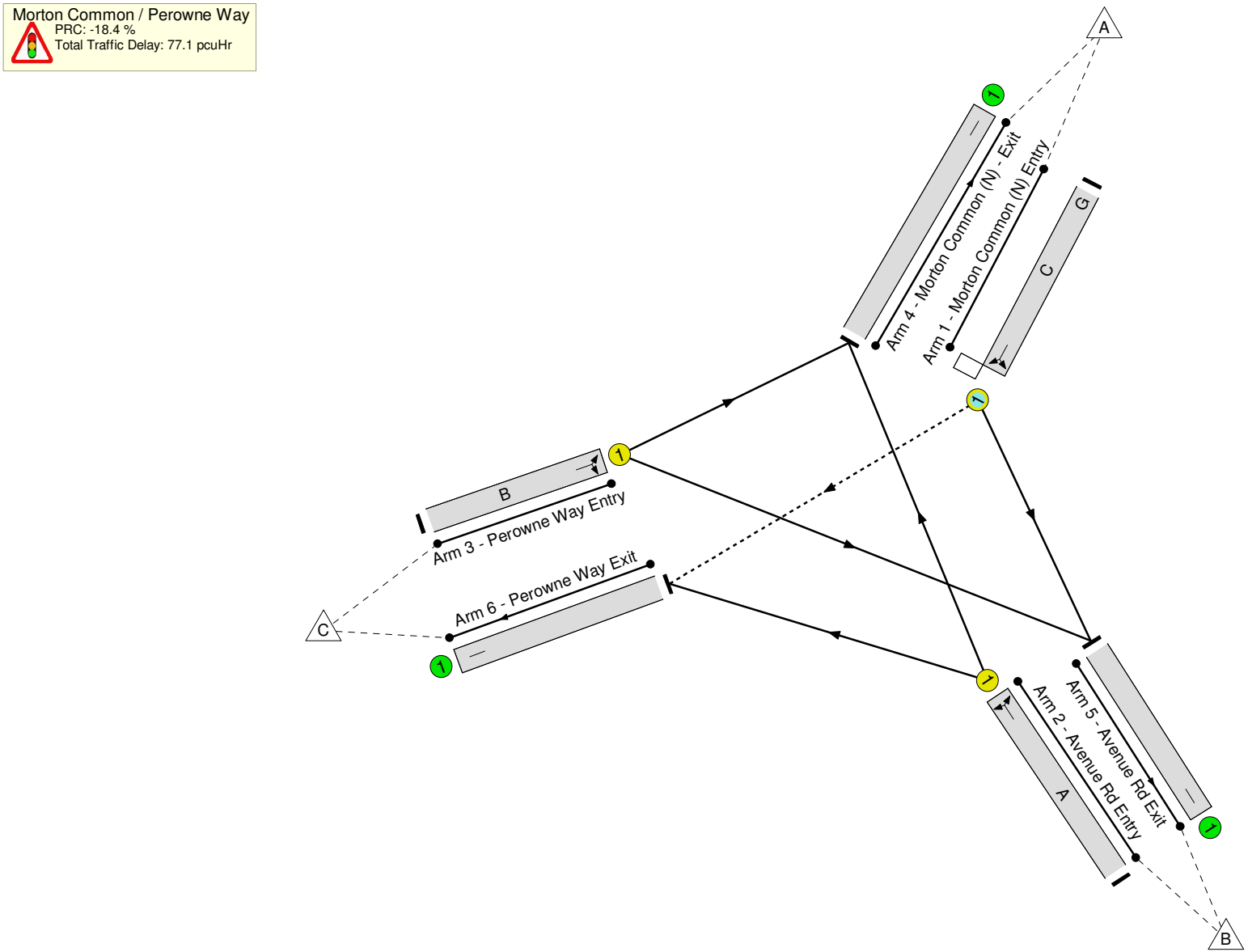
Stage	1	2	3
Duration	21	11	7
Change Point	0	28	46

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Increased cycle time to 90 seconds for 2034 scenario - improves capacity for AM and PM - however PM still remains over capacity
Need to check pedestrian phases etc.
Pedestrian phases are very infrequent and do not run for majority of cycles.

Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**106.6%**
Morton Common / Perowne Way	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**106.6%**
1/1	Morton Common (N) Entry Left Ahead	O	N/A	N/A	C	G	1	39	13	787	1819	750	105.0%
2/1	Avenue Rd Entry Right Left	U	N/A	N/A	A		1	21	-	765	1958	718	106.6%
3/1	Perowne Way Entry Ahead Right	U	N/A	N/A	B		1	7	-	240	1742	232	103.3%
4/1	Morton Common (N) - Exit	U	N/A	N/A	-		-	-	-	803	Inf	Inf	0.0%
5/1	Avenue Rd Exit	U	N/A	N/A	-		-	-	-	723	Inf	Inf	0.0%
6/1	Perowne Way Exit	U	N/A	N/A	-		-	-	-	266	Inf	Inf	0.0%

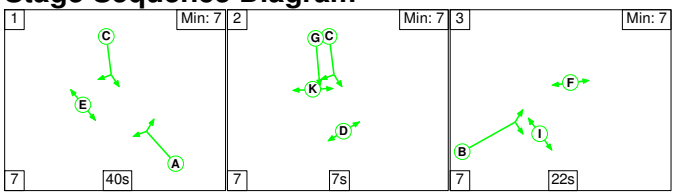
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**0**	**146**	**6**	**10.8**	**65.9**	**0.3**	**77.1**	**-**	**-**	**-**	**-**
Morton Common / Perowne Way	**-**	**-**	**0**	**146**	**6**	**10.8**	**65.9**	**0.3**	**77.1**	**-**	**-**	**-**	**-**
1/1	787	750	0	146	6	3.5	26.1	0.3	29.9	136.8	13.7	26.1	39.8
2/1	765	718	-	-	-	5.4	29.9	-	35.3	166.0	13.5	29.9	43.5
3/1	240	232	-	-	-	2.0	9.9	-	11.9	178.7	4.1	9.9	14.0
4/1	758	758	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	690	690	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	252	252	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -18.4 Total Delay for Signalled Lanes (pcuHr): 77.09 Cycle Time (s): 60
PRC Over All Lanes (%): -18.4 Total Delay Over All Lanes(pcuHr): 77.09

Full Input Data And Results

Scenario 5: '2034 Base AM - 90 secs' (FG3: '2034 Base AM', Plan 1: 'Network Control Plan 1')

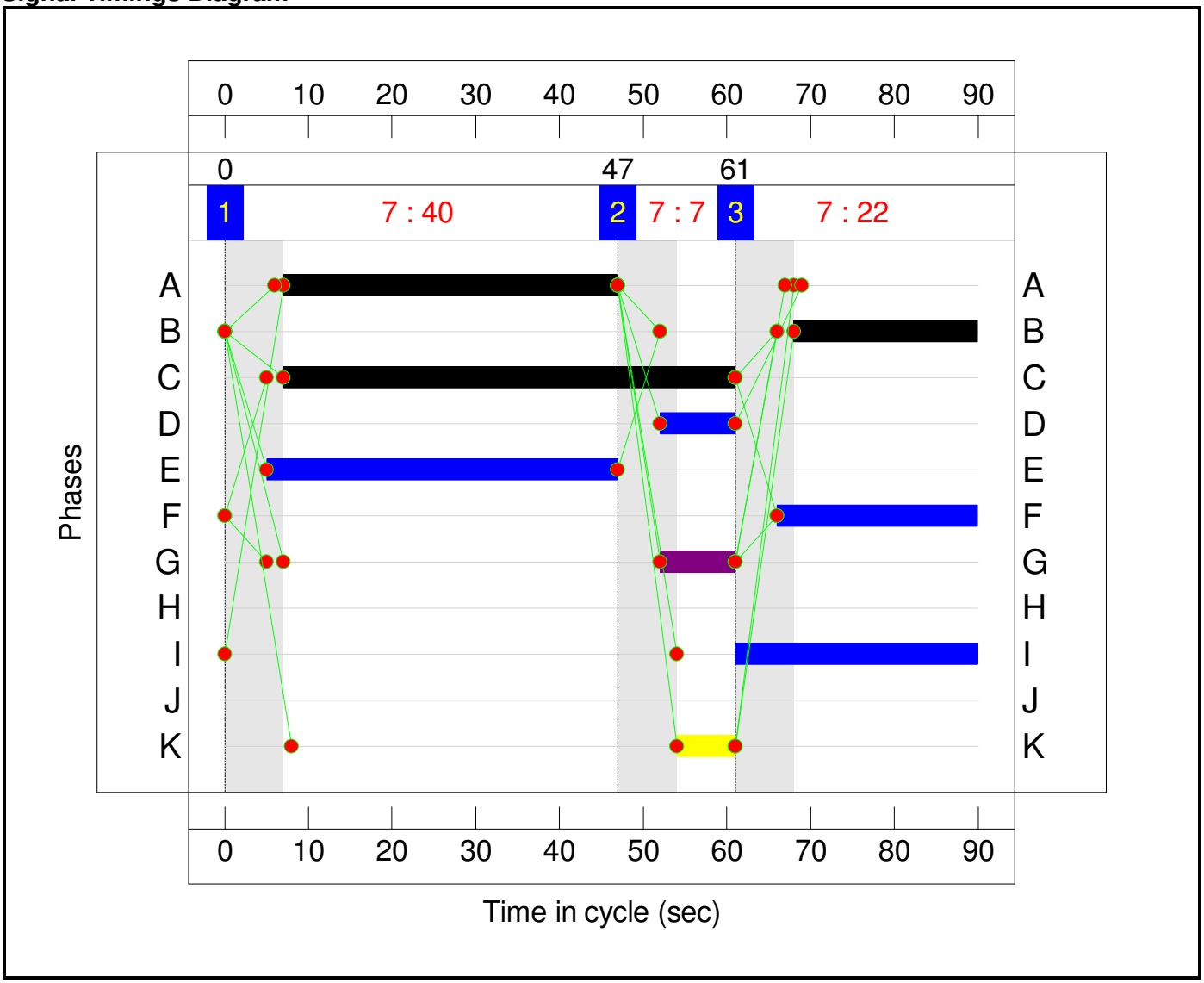
Stage Sequence Diagram



Stage Timings

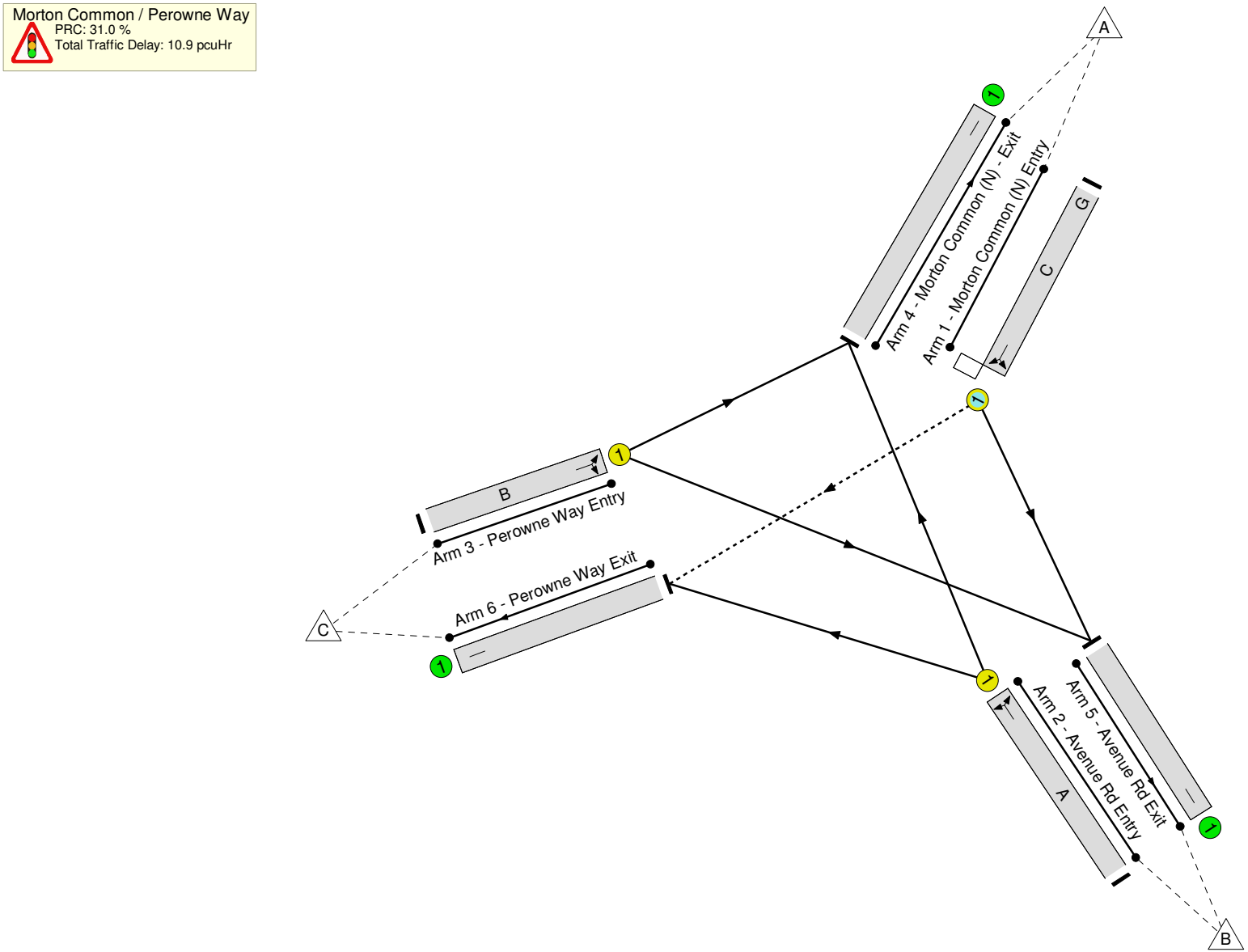
Stage	1	2	3
Duration	40	7	22
Change Point	0	47	61

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Increased cycle time to 90 seconds for 2034 scenario - improves capacity for AM and PM - however PM still remains over capacity
Need to check pedestrian phases etc.
Pedestrian phases are very infrequent and do not run for majority of cycles.

Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**68.7%**
Morton Common / Perowne Way	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**68.7%**
1/1	Morton Common (N) Entry Left Ahead	O	N/A	N/A	C	G	1	54	9	564	1831	878	64.2%
2/1	Avenue Rd Entry Right Left	U	N/A	N/A	A		1	40	-	606	1963	894	67.8%
3/1	Perowne Way Entry Ahead Right	U	N/A	N/A	B		1	22	-	304	1732	443	68.7%
4/1	Morton Common (N) - Exit	U	N/A	N/A	-		-	-	-	690	Inf	Inf	0.0%
5/1	Avenue Rd Exit	U	N/A	N/A	-		-	-	-	633	Inf	Inf	0.0%
6/1	Perowne Way Exit	U	N/A	N/A	-		-	-	-	151	Inf	Inf	0.0%

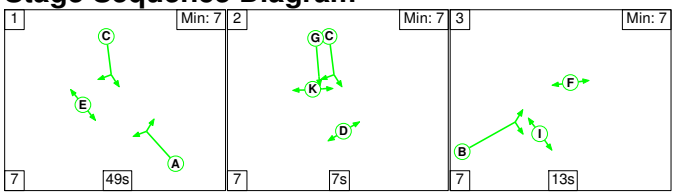
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**72**	**11**	**1**	**7.7**	**3.0**	**0.2**	**10.9**	**-**	**-**	**-**	**-**
Morton Common / Perowne Way	**-**	**-**	**72**	**11**	**1**	**7.7**	**3.0**	**0.2**	**10.9**	**-**	**-**	**-**	**-**
1/1	564	564	72	11	1	1.9	0.9	0.2	3.0	19.1	10.5	0.9	11.4
2/1	606	606	-	-	-	3.2	1.0	-	4.3	25.5	11.8	1.0	12.8
3/1	304	304	-	-	-	2.6	1.1	-	3.6	43.0	6.8	1.1	7.9
4/1	690	690	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	633	633	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	151	151	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 31.0 Total Delay for Signalled Lanes (pcuHr): 10.92 Cycle Time (s): 90
PRC Over All Lanes (%): 31.0 Total Delay Over All Lanes(pcuHr): 10.92

Full Input Data And Results

Scenario 6: '2034 Base PM - 90 secs' (FG4: '2034 Base PM', Plan 1: 'Network Control Plan 1')

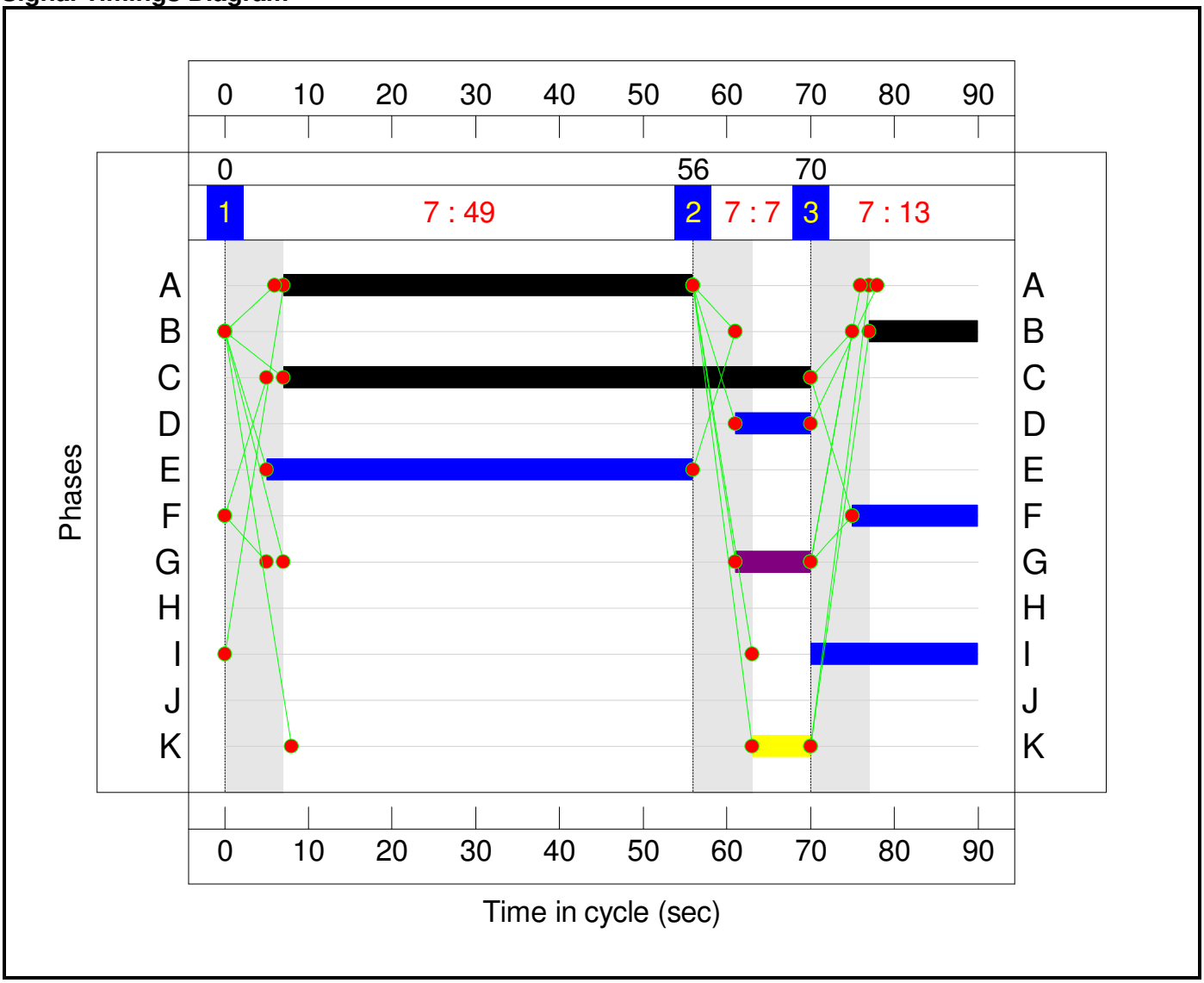
Stage Sequence Diagram



Stage Timings

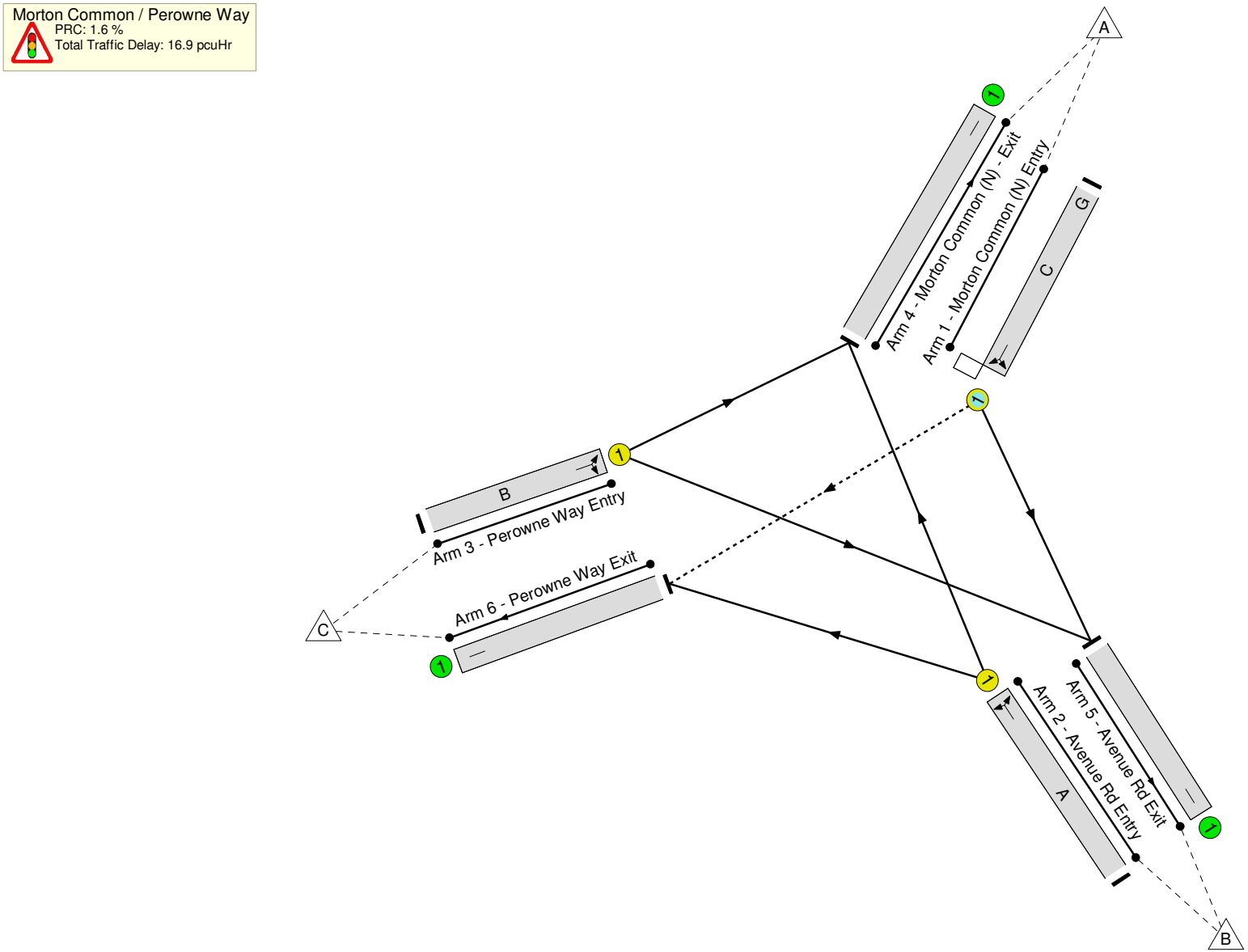
Stage	1	2	3
Duration	49	7	13
Change Point	0	56	70

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Increased cycle time to 90 seconds for 2034 scenario - improves capacity for AM and PM - however PM still remains over capacity
Need to check pedestrian phases etc.
Pedestrian phases are very infrequent and do not run for majority of cycles.

Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**88.6%**
Morton Common / Perowne Way	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**88.6%**
1/1	Morton Common (N) Entry Left Ahead	O	N/A	N/A	C	G	1	63	9	787	1819	901	87.3%
2/1	Avenue Rd Entry Right Left	U	N/A	N/A	A		1	49	-	765	1958	1088	70.3%
3/1	Perowne Way Entry Ahead Right	U	N/A	N/A	B		1	13	-	240	1742	271	88.6%
4/1	Morton Common (N) - Exit	U	N/A	N/A	-		-	-	-	803	Inf	Inf	0.0%
5/1	Avenue Rd Exit	U	N/A	N/A	-		-	-	-	723	Inf	Inf	0.0%
6/1	Perowne Way Exit	U	N/A	N/A	-		-	-	-	266	Inf	Inf	0.0%

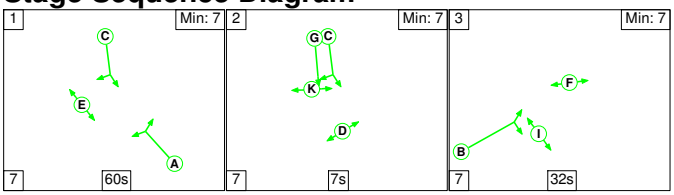
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**130**	**28**	**2**	**8.9**	**7.6**	**0.3**	**16.9**	**-**	**-**	**-**	**-**
Morton Common / Perowne Way	**-**	**-**	**130**	**28**	**2**	**8.9**	**7.6**	**0.3**	**16.9**	**-**	**-**	**-**	**-**
1/1	787	787	130	28	2	3.4	3.3	0.3	6.9	31.7	17.5	3.3	20.7
2/1	765	765	-	-	-	3.1	1.2	-	4.3	20.1	13.8	1.2	15.0
3/1	240	240	-	-	-	2.5	3.2	-	5.7	85.4	5.9	3.2	9.1
4/1	803	803	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	723	723	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	266	266	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 1.6 Total Delay for Signalled Lanes (pcuHr): 16.89 Cycle Time (s): 90
PRC Over All Lanes (%): 1.6 Total Delay Over All Lanes(pcuHr): 16.89

Full Input Data And Results

Scenario 7: '2034 Base AM - 120 secs' (FG3: '2034 Base AM', Plan 1: 'Network Control Plan 1')

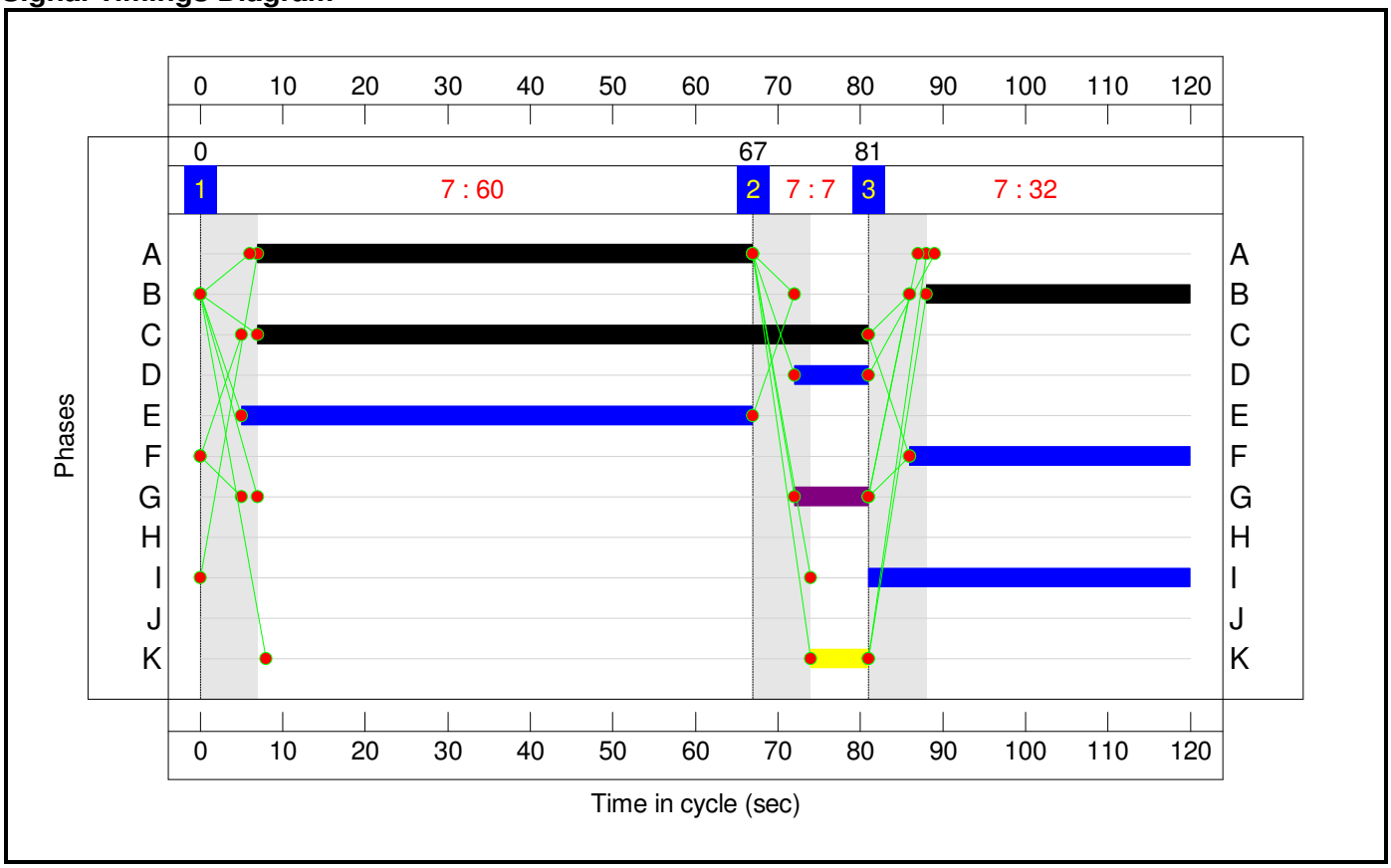
Stage Sequence Diagram



Stage Timings

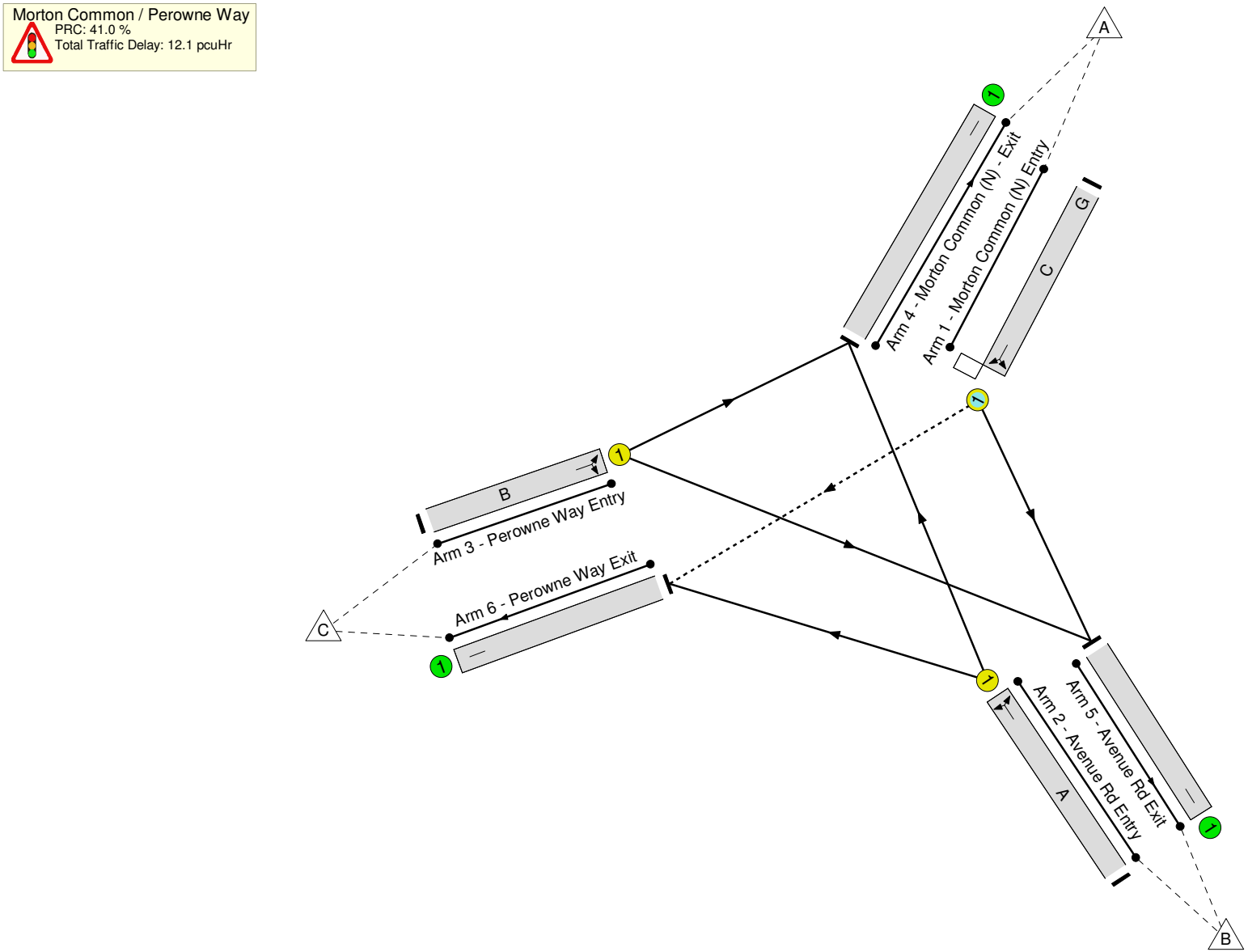
Stage	1	2	3
Duration	60	7	32
Change Point	0	67	81

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Increased cycle time to 90 seconds for 2034 scenario - improves capacity for AM and PM - however PM still remains over capacity
Need to check pedestrian phases etc.
Pedestrian phases are very infrequent and do not run for majority of cycles.

Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**63.8%**
Morton Common / Perowne Way	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**63.8%**
1/1	Morton Common (N) Entry Left Ahead	O	N/A	N/A	C	G	1	74	9	564	1831	901	62.6%
2/1	Avenue Rd Entry Right Left	U	N/A	N/A	A		1	60	-	606	1963	998	60.7%
3/1	Perowne Way Entry Ahead Right	U	N/A	N/A	B		1	32	-	304	1732	476	63.8%
4/1	Morton Common (N) - Exit	U	N/A	N/A	-		-	-	-	690	Inf	Inf	0.0%
5/1	Avenue Rd Exit	U	N/A	N/A	-		-	-	-	633	Inf	Inf	0.0%
6/1	Perowne Way Exit	U	N/A	N/A	-		-	-	-	151	Inf	Inf	0.0%

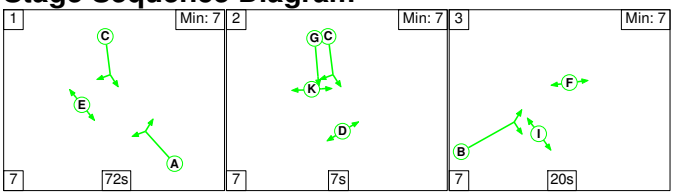
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**75**	**8**	**1**	**9.4**	**2.5**	**0.2**	**12.1**	**-**	**-**	**-**	**-**
Morton Common / Perowne Way	**-**	**-**	**75**	**8**	**1**	**9.4**	**2.5**	**0.2**	**12.1**	**-**	**-**	**-**	**-**
1/1	564	564	75	8	1	2.6	0.8	0.2	3.6	23.3	13.8	0.8	14.6
2/1	606	606	-	-	-	3.5	0.8	-	4.3	25.6	14.3	0.8	15.1
3/1	304	304	-	-	-	3.2	0.9	-	4.1	48.6	8.9	0.9	9.7
4/1	690	690	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	633	633	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	151	151	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 41.0 Total Delay for Signalled Lanes (pcuHr): 12.06 Cycle Time (s): 120
PRC Over All Lanes (%): 41.0 Total Delay Over All Lanes(pcuHr): 12.06

Full Input Data And Results

Scenario 8: '2034 Base PM - 120 secs' (FG4: '2034 Base PM', Plan 1: 'Network Control Plan 1')

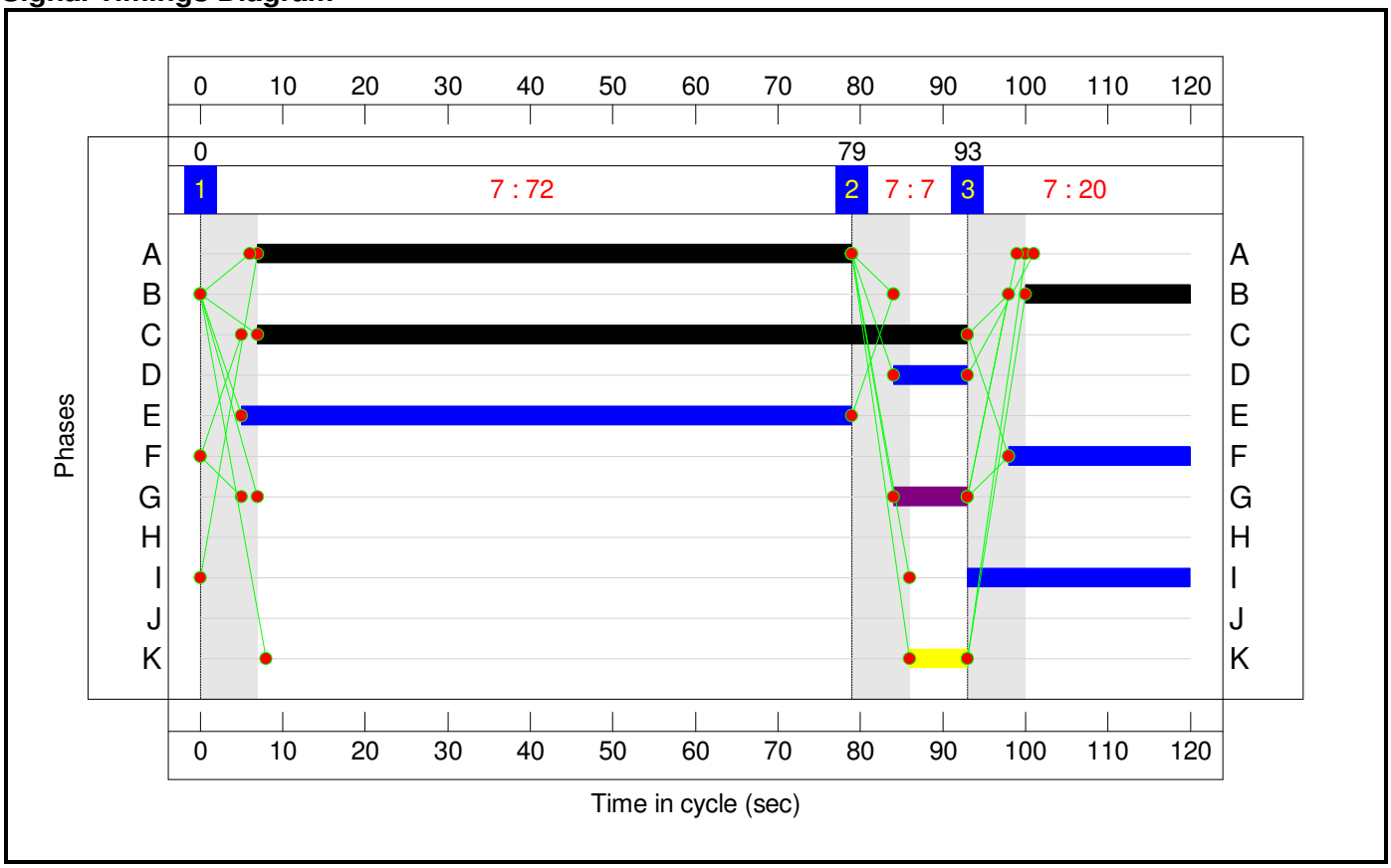
Stage Sequence Diagram



Stage Timings

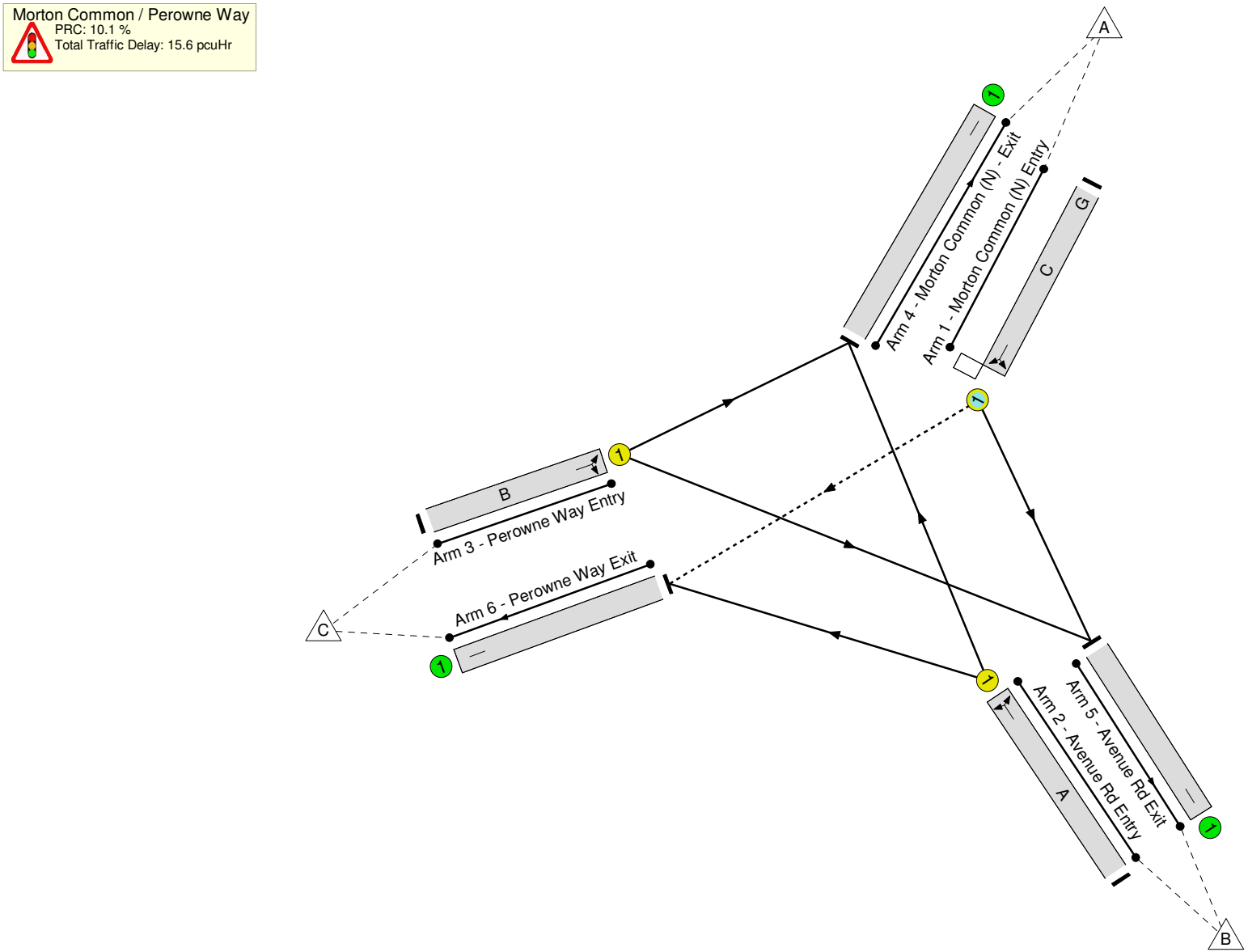
Stage	1	2	3
Duration	72	7	20
Change Point	0	79	93

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Increased cycle time to 90 seconds for 2034 scenario - improves capacity for AM and PM - however PM still remains over capacity
Need to check pedestrian phases etc.
Pedestrian phases are very infrequent and do not run for majority of cycles.

Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**81.8%**
Morton Common / Perowne Way	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**81.8%**
1/1	Morton Common (N) Entry Left Ahead	O	N/A	N/A	C	G	1	86	9	787	1819	963	81.8%
2/1	Avenue Rd Entry Right Left	U	N/A	N/A	A		1	72	-	765	1958	1191	64.2%
3/1	Perowne Way Entry Ahead Right	U	N/A	N/A	B		1	20	-	240	1742	305	78.7%
4/1	Morton Common (N) - Exit	U	N/A	N/A	-		-	-	-	803	Inf	Inf	0.0%
5/1	Avenue Rd Exit	U	N/A	N/A	-		-	-	-	723	Inf	Inf	0.0%
6/1	Perowne Way Exit	U	N/A	N/A	-		-	-	-	266	Inf	Inf	0.0%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**143**	**16**	**1**	**10.5**	**4.8**	**0.3**	**15.6**	**-**	**-**	**-**	**-**
Morton Common / Perowne Way	**-**	**-**	**143**	**16**	**1**	**10.5**	**4.8**	**0.3**	**15.6**	**-**	**-**	**-**	**-**
1/1	787	787	143	16	1	4.2	2.2	0.3	6.6	30.3	21.6	2.2	23.8
2/1	765	765	-	-	-	3.2	0.9	-	4.1	19.3	16.4	0.9	17.3
3/1	240	240	-	-	-	3.2	1.8	-	4.9	73.7	7.6	1.8	9.4
4/1	803	803	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	723	723	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	266	266	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 10.1 Total Delay for Signalled Lanes (pcuHr): 15.63 Cycle Time (s): 120
PRC Over All Lanes (%): 10.1 Total Delay Over All Lanes(pcuHr): 15.63