Isle of Wight Council

Isle of Wight Junction Assessment and Design

Junction Feasibility Study – Marlborough Road / Great Preston Road

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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

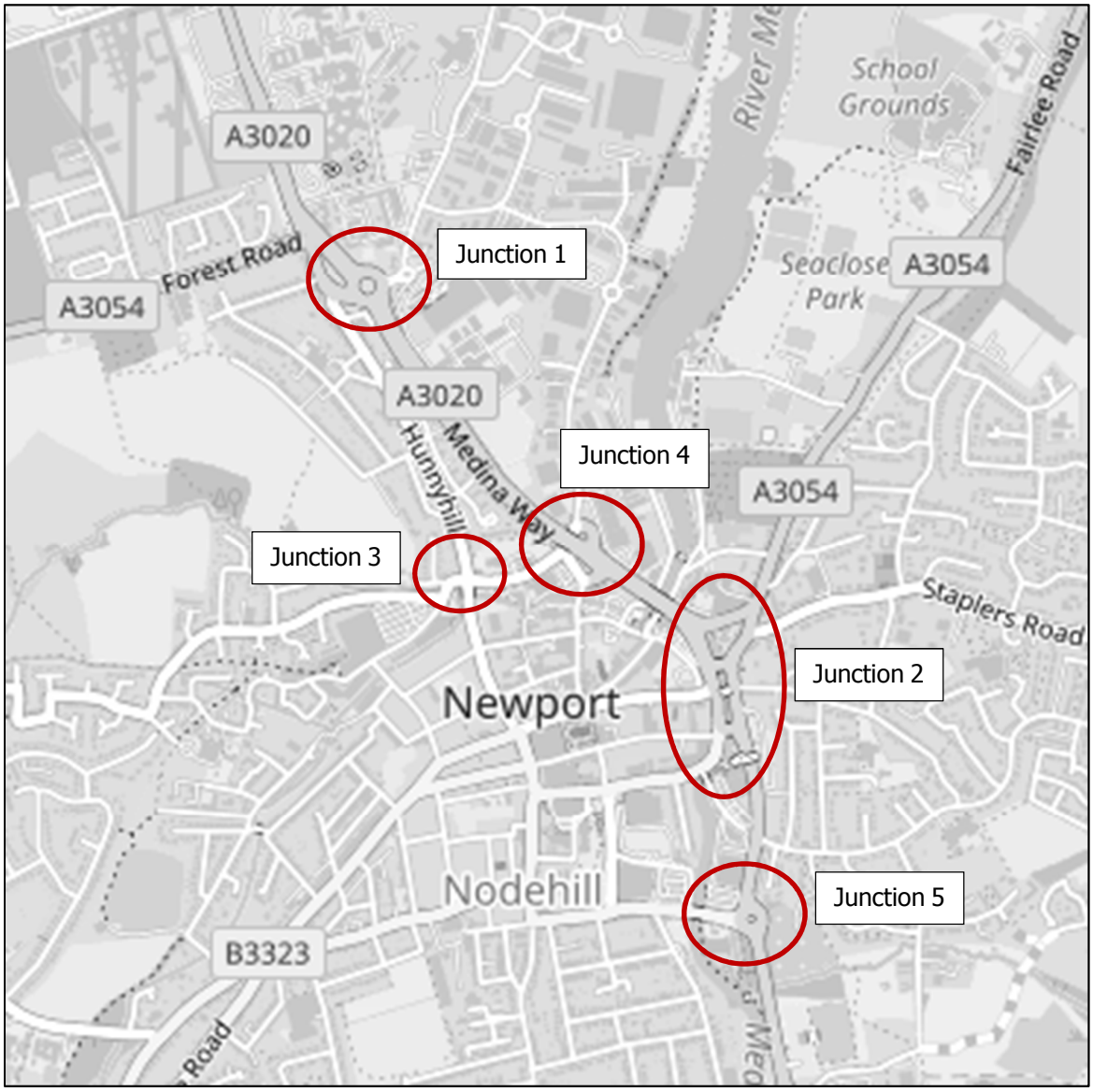
1.4 The Isle of Wight is an island located in the English Channel, approximately 6km off the Hampshire coast. The towns of Newport, Ryde, Shanklin and Sandown comprise the project study area for this feasibility study.

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.

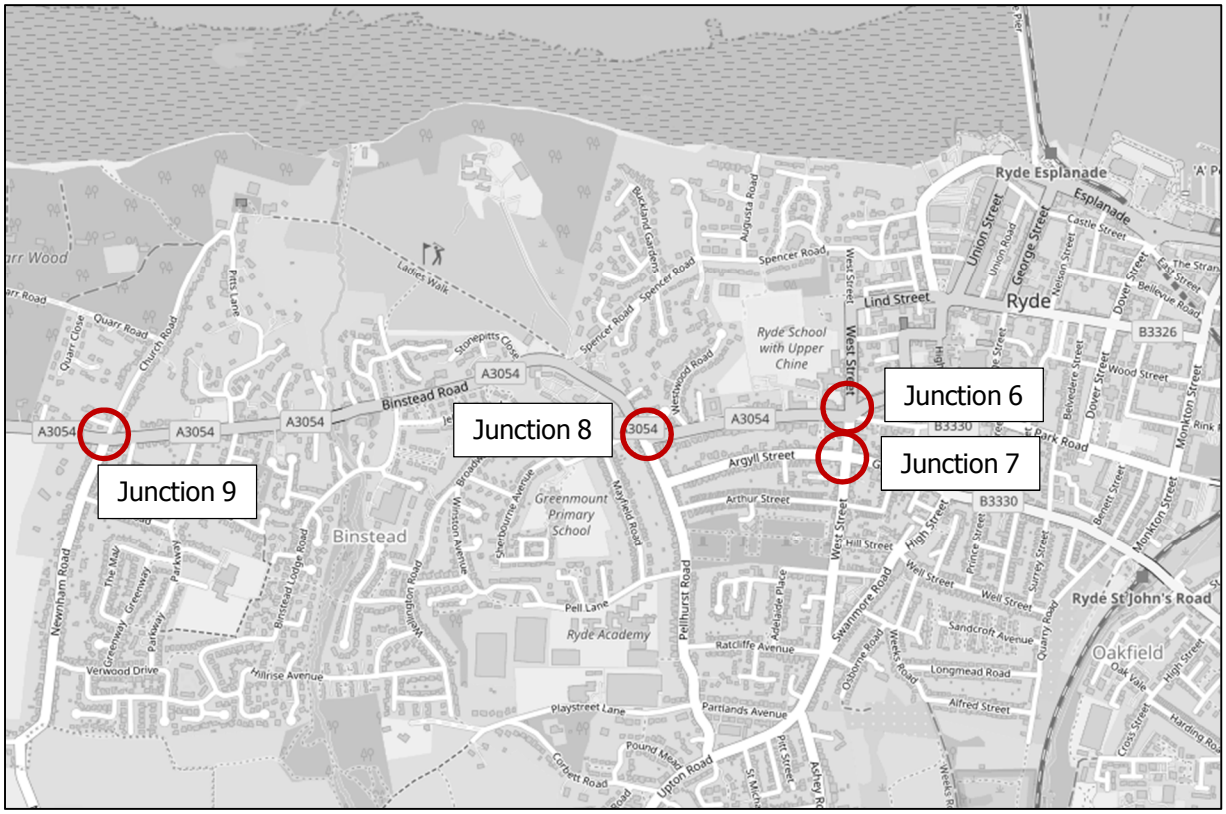
1.7 **Figures 1.1 – 1.3** presents the locations of all 15 junctions within Newport, Ryde and Shanklin & Sandown, which comprise the feasibility study area.

Figure 1.1 Feasibility Study Area – Newport Junctions



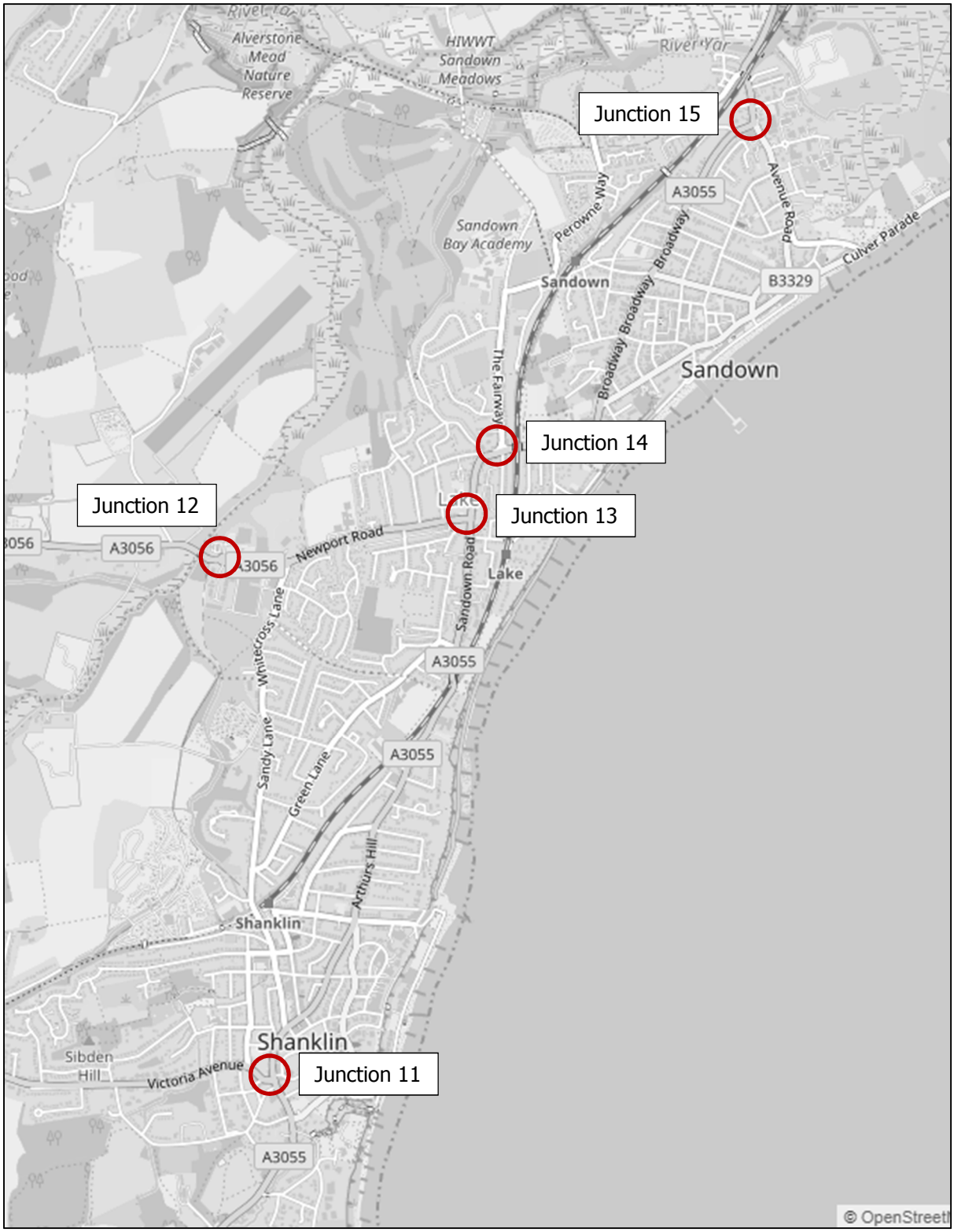
Source: OpenStreetMap with WYG Annotations, September 2017

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 10, the junction of Marlborough Road / Great Preston Road which is a signalised crossroads junction.

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

Figure 1.4 Junction Location Plan

Source: Google Satellite Image, October 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: 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 signalised crossroad junction at Marlborough Road / Great Preston Road in Ryde.

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
- Traffic video 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.

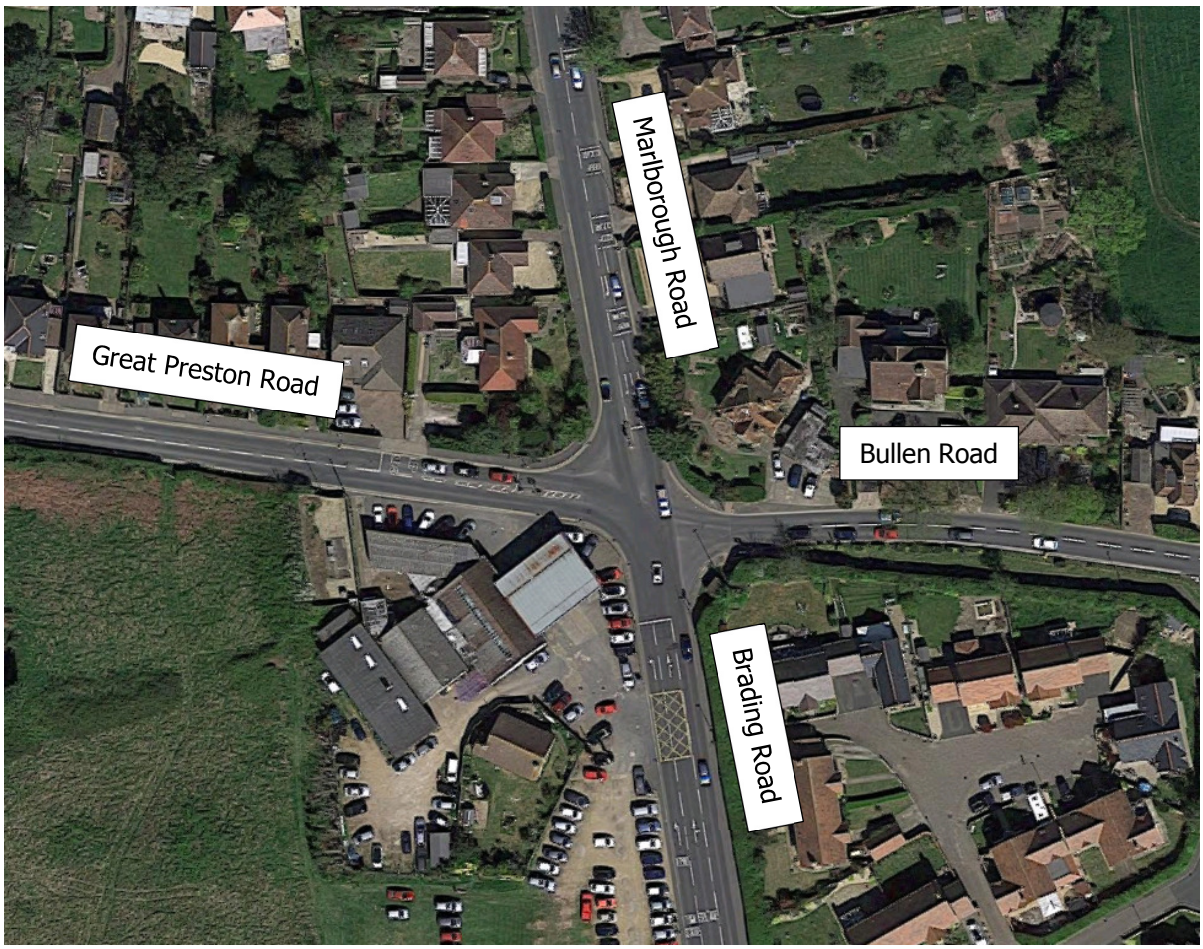
2.6 The data collected as part of the surveys was used directly for calibrating and validating the base scenario for both the Junctions 9 and LinSig models. Video footage of the surveyed junctions was additionally reviewed to ensure that the base models reflect the on-street road conditions as closely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

Study Area/Junction Background

2.7 The Marlborough Road / Great Preston Road signalised crossroads junction is located on the southeastern edge of Ryde, approximately 2km southeast of Ryde town centre. The A3055 Marlborough Road forms the northern arm, A3055 Brading Road forms the southern arm, Great Preston Road forms the western arm and Bullen Road forms the eastern arm.

2.8 The junction provides access to Ryde to the north and west, Tesco Extra, Sandown and Shanklin to the south and the town of Seaview to the east. A location plan of the junction is provided in **Figure 2.1**.

Figure 2.1 Junction Location Plan

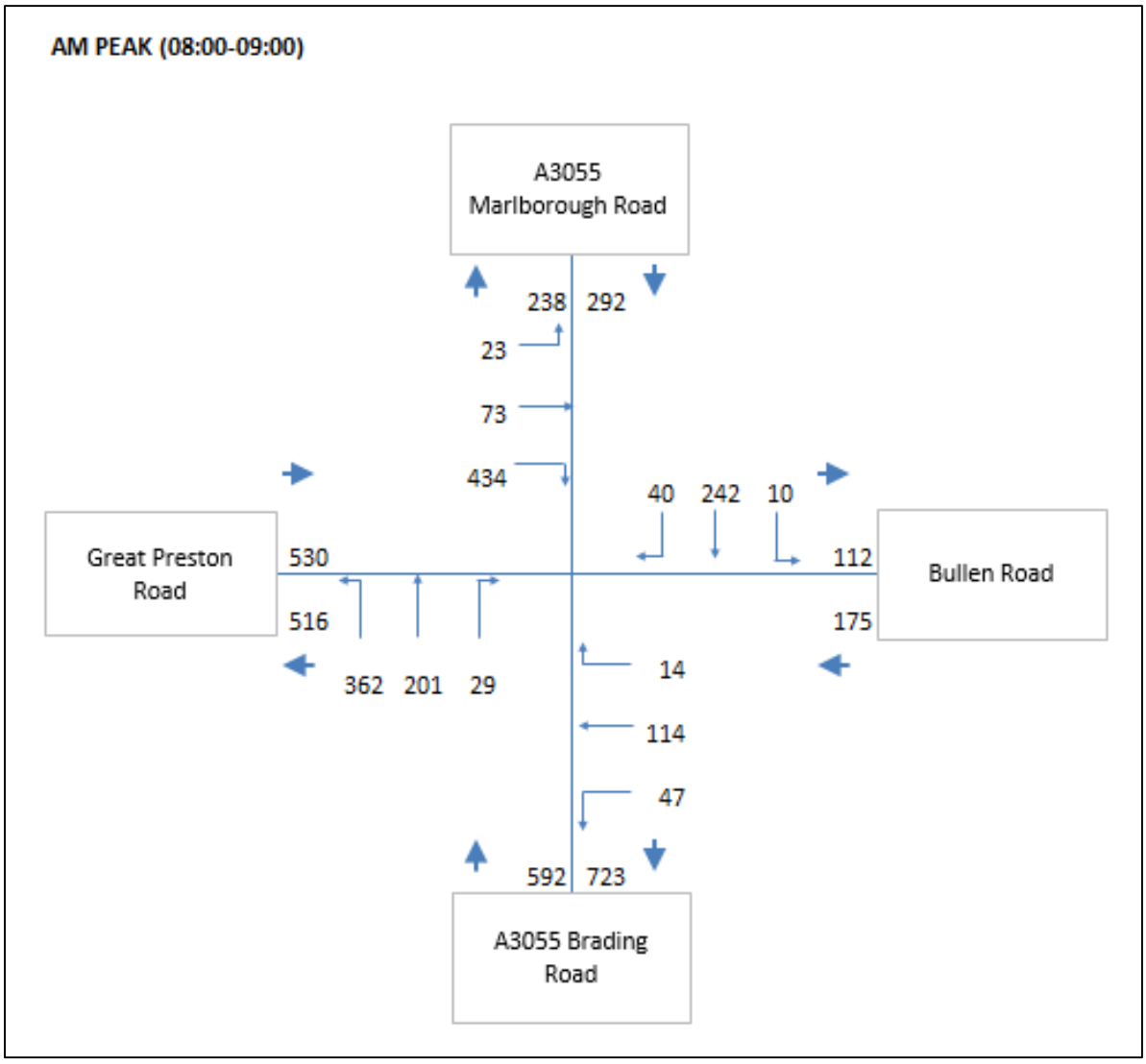


Source: Google Satellite Image, October 2017

Base Traffic Flows

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

Figure 2.2 AM Traffic Flows (PCUs)

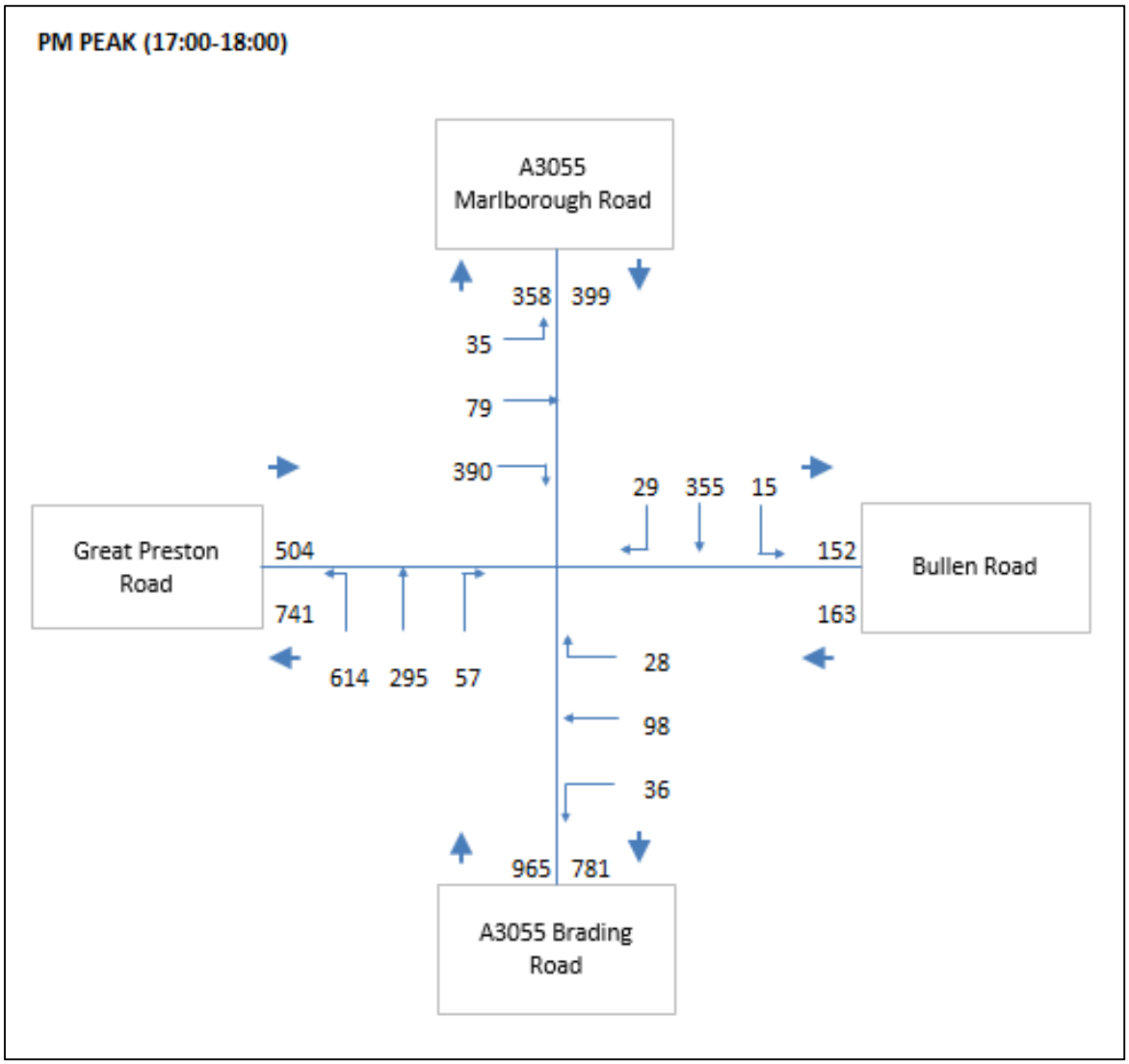


2.10 As shown in Figure 2.2, the highest traffic flows are those travelling southbound from Great Preston Road to the A3055 Brading Road in the AM Peak (08:00-09:00) with 434 PCUs undertaking this movement. High flows are also recorded travelling northbound in the opposite direction from Brading Road to Great Preston Road. These flows are likely to be associated with the morning commute between Ryde, Sandown and Shanklin.

2.11 Northbound and southbound traffic between the A3055 Marlborough Road and Brading Road is also significant, with 201 PCUs travelling northbound and 242 PCUs travelling southbound. Queuing occurs on all four arms, but it is particularly prevalent on Great Preston Road and Brading Road. A maximum observed queue of 15 vehicles was recorded on Great Preston Road, whilst on Brading Road a maximum observed queue of 9 vehicles was recorded.

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

Figure 2.3 PM Traffic Flows (PCUs)



2.13 As shown in Figure 2.3, the highest traffic flows are those travelling northbound from the A3055 Brading Road to Great Preston Road in the PM Peak (17:00-18:00), with 614 PCUs undertaking this movement. High flows are also recorded in the opposite direction from Great Preston Road to the A3055 Brading Road, with 390 PCUs recorded.

2.14 Northbound and southbound traffic between the A3055 Marlborough Road and Brading Road is also fairly high, with 295 PCUs travelling northbound and 355 PCUs southbound. Queuing occurs on all four arms, but it is particularly evident on Brading Road and Marlborough Road. Maximum observed queues of 17 vehicles and 18 vehicles were recorded on Brading Road and Marlborough Road.

Existing Traffic Issues

2.15 At present, the junction is known to experience congestion and queuing, which has been observed during site visits and traffic video surveys at the junction. It was observed that congestion and queuing is particularly evident on the A3055 Marlborough Road and A3055 Brading Road.

Collisions

2.16 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 collisions were recorded within the vicinity of the junction during this time period, of which three were 'slight' and the remaining one was 'serious'. It is therefore concluded that there are no significant highway safety issues in relation to the highway junction.

Local Highway Network

2.17 The signalised crossroads junction comprises the A3055 Marlborough Road, Bullen Road, Brading Road and Great Preston Road. This section provides a description of each of these roads.

A3055 Marlborough Road

2.18 The A3055 Marlborough Road is a two-way single carriageway road and is largely residential in nature. It is subject to a 30mph speed limit, with footways provided on both sides of the carriageway. The road provides a north-south link through the town of Ryde, and comprises a two-lane approach at the junction.

Bullen Road

2.19 Bullen Road is a two-way single carriageway road and is predominantly rural in nature. The road provides a link to the towns of Nettlestone and Seaview. In the vicinity of the junction, it is subject to a 30mph speed limit. A footway is provided on the southern side of the carriageway.

A3055 Brading Road

2.20 A3055 Brading Road is a two-way single carriageway road, with a two-lane approach at the junction. It provides access to Sandown and Shanklin, to the southeast of the island. It is subject to a 30mph speed limit on the approach to the junction, whilst the remainder of the road is subject to a 40mph speed limit. Footways are provided on both sides of the carriageway.

Great Preston Road

2.21 Great Preston Road is a two-way residential single carriageway road. It is subject to a 30mph speed limit, with a footway provided on the northern side of the carriageway. The road comprises a one-lane approach at the junction.

3 Modelling Methodology

Introduction

3.1 Traffic modelling has been undertaken as part of the feasibility study, identifying how the local highway network operates and how it might operate following the proposed improvements to the junction. LinSig v3 is the latest version of JCT's industry-standard software for modelling signalised junctions and urban road networks and has therefore been used to model this junction.

3.2 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. 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 Marlborough Road / Great Preston Road signalised crossroads junction are summarised in **Table 3.1**, with full output results included in **Appendix A**.

LinSig Model Results – 2017 Base Year

Table 3.1 Base Year Assessment: LinSig Modelling Results

Arm Cycle time 80 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+1/2 – Marlborough Road	51.2%	5.2	32.4	58.7%	7.3	28.5
2/1 – Bullen Road	71.1%	4.9	57.6	72.8%	4.7	62.2
3/1 – Brading Road	34.2%	4.0	9.3	56.9%	8.1	11.6
3/2 – Brading Road	68.0%	5.7	48.1	76.2%	8.7	44.9
4/1+4/2 – Great Preston Road	70.4%	10.7	26.9	78.6%	11.7	35.5
PRC	26.7%			14.5%		
Total Delay (pcu/hr)	13.34			17.29		

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. The junction operates with a PRC of 26.7% in the AM Peak, whilst a PRC of 14.5% is recorded in the PM Peak. It is shown that all arms currently operate with a DoS of below 90%.

3.8 Modelled queues of 11-12 PCUs are recorded on Great Preston Road in the AM and PM Peak, whilst modelled queues of 7-9 PCUs are recorded on Brading Road and Marlborough Road in the PM Peak. These modelled queues have been calibrated against the observed queues at the junction.

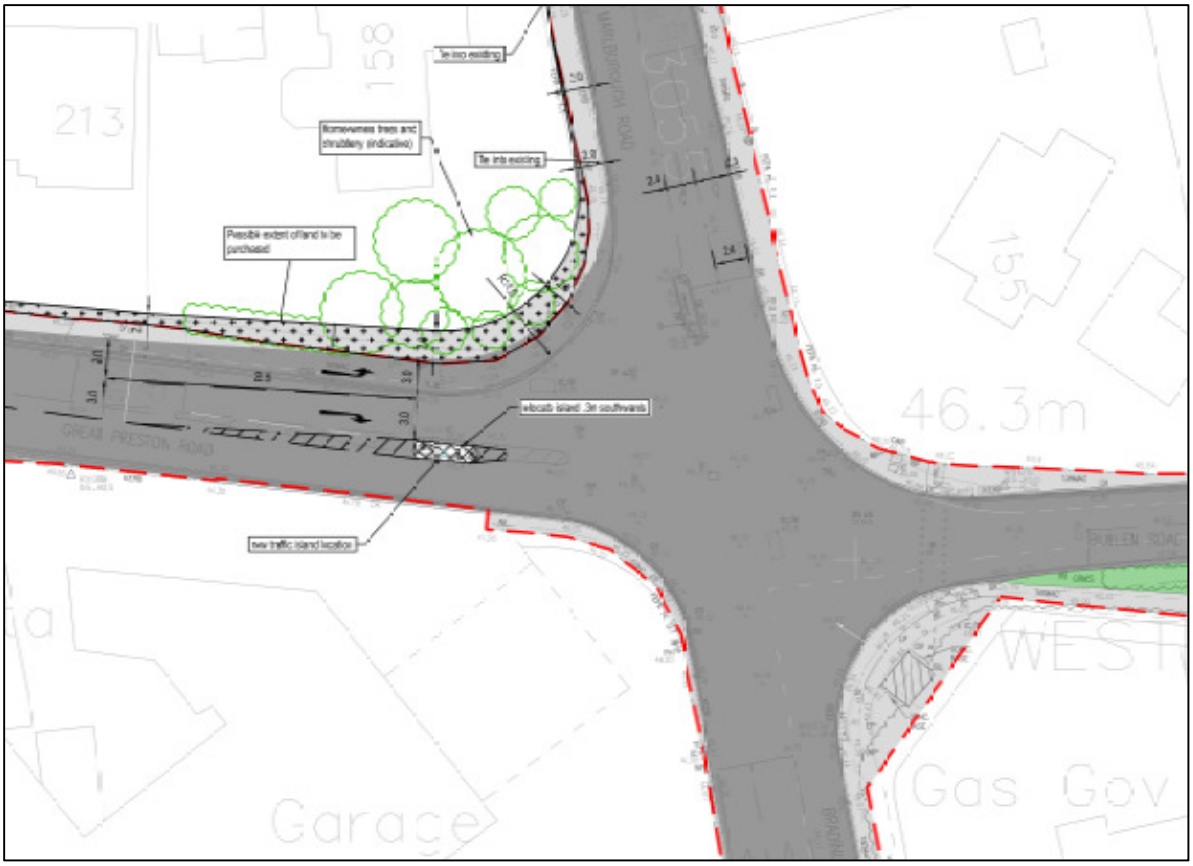
Proposals

3.9 In terms of a proposed scheme for the junction, a proposed indicative junction design has been tested and it has been noted that due to space constraints at the junction, there is little that can be done in regards to physical improvements without the acquisition of land along the northern side of Great Preston Road. A design has been developed with this land acquisition which involves the widening of Great Preston Road to two lanes, allowing for a designated lane for right-turners. Alongside this proposed design, non-physical alterations such as lengthening the cycle time have been tested. Longer cycle times were also tested for the existing junction as to determine how the junction would perform without any physical improvements.

3.10 Taking into account the Base Year modelling results, the main capacity issues experienced at the junction are found on the Great Preston Road, Bullen Road and Brading Road arms, which currently experience the highest queues and highest DoS. Subsequently, it is hoped that the proposed indicative design addresses these issues and provides additional capacity at the junction.

3.11 The proposed indicative junction design is shown in **Figure 3.1** below.

Figure 3.1 Proposed Indicative Junction Design



Forecast/Future Year Modelling

3.12 Forecast or Future Year modelling was undertaken for the junction. The Future Year 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.

3.13 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.

3.14 These TEMPRO growth factors are shown in **Table 3.2**.

Table 3.2 2017-2034 TEMPRO Growth Factors – All Urban Road Types

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

3.15 The Future Year results for the proposed junction design are summarised in **Table 3.3**, with full output results included in **Appendix A**. The 1:200 scale drawing **A090129-99-004 Rev C** is included in **Appendix B**.

Existing Junction

LinSig Results – Future Year – Existing Junction

Table 3.3 Future Year Assessment: Existing Junction (80 secs)

Arm Cycle time 80 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+1/2 – Marlborough Road	62.6%	6.7	35.1	73.9%	10.2	34.5
2/1 – Bullen Road	86.9%	7.4	81.6	88.0%	7.2	89.6
3/1 – Brading Road	41.8%	5.1	10.1	69.3%	11.5	14.3
3/2 – Brading Road	83.1%	8.3	62.2	94.0%	14.8	78.6
4/1+4/2 – Great Preston Road	86.2%	15.9	37.3	92.4%	18.0	53.7
PRC	3.5%			-4.4%		
Total Delay (pcu/hr)	21.06			30.96		

3.16 As shown in Table 3.3, the Future Year assessment indicates that the existing junction would operate within capacity in the AM Peak, whilst it is expected to go over maximum capacity in the PM Peak. For instance, an overall PRC of 3.5% is recorded in the AM Peak and a PRC of -4.4% is recorded in the PM Peak. It is shown that the DoS on Great Preston Road and Brading Road (Lane 3/2 – Ahead & Right turn) goes over 90% in the PM Peak, whilst other arms such as Bullen Road is approaching the 90% DoS threshold in the AM and PM peaks.

3.17 The following **Tables 3.4** and **3.5** demonstrate how the junction operates with longer cycle times of 90 and 120 seconds. It is anticipated that this will improve capacity at the junction.

Table 3.4 Future Year Assessment: Existing Junction (90 secs)

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+1/2 – Marlborough Road	65.2%	7.7	40.1	70.8%	10.8	34.7
2/1 – Bullen Road	82.8%	7.3	74.3	90.0%	8.2	102.0
3/1 – Brading Road	40.7%	5.5	10.1	66.5%	11.8	13.3
3/2 – Brading Road	81.8%	8.8	63.8	90.4%	14.0	67.0
4/1+4/2 – Great Preston Road	82.4%	16.3	34.5	91.7%	19.2	54.5
PRC	8.8%			-1.9%		
Total Delay (pcu/hr)	20.75			30.21		

3.18 As shown in Table 3.4, the results of a 90 second cycle time indicate that in the AM Peak the existing junction would operate just within capacity, whilst it remains over capacity in the PM Peak. During the AM Peak, the DoS on all arms is below 90% whereas in the PM Peak, the DoS on Marlborough Road,

Bullen Road and Great Preston Road is recorded at or above 90%. Thus, a cycle time of 120 seconds was tested with the results presented in **Table 3.5** below.

Table 3.5 Future Year Assessment: Existing Junction (120 secs)

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+1/2 – Marlborough Road	67.8%	10.2	51.7	68.1%	13.8	40.7
2/1 – Bullen Road	75.5%	8.2	73.2	88.0%	9.4	106.8
3/1 – Brading Road	38.5%	6.5	10.3	62.1%	13.3	12.2
3/2 – Brading Road	74.7%	10.1	64.8	88.4%	17.0	68.6
4/1+4/2 – Great Preston Road	78.5%	19.7	36.9	88.5%	22.4	54.7
PRC	14.7%			1.7%		
Total Delay (pcu/hr)	22.36			31.28		

As shown in Table 3.5, the results of a 120 second cycle time indicate that in the AM Peak the existing junction would operate within capacity during the AM Peak, and just within capacity in the PM Peak. An overall PRC of 14.7% is recorded in the AM Peak, whilst an PRC of 1.7% is recorded in the PM Peak. All arms are expected to perform with a DoS of under 90%.

Proposed Junction Design

3.19 The modelling output results for the proposed junction design (as shown in Figure 3.1) are presented in **Tables 3.6-3.8** below.

Table 3.6 Future Year Assessment: Proposed Junction (80 secs)

Arm Cycle time 80 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+1/2 – Marlborough Road	60.2%	6.6	33.6	64.9%	9.0	27.8
2/1 – Bullen Road	73.6%	5.8	54.6	80.0%	6.1	67.7
3/1 – Brading Road	43.5%	5.5	11.3	70.7%	12.0	15.3
3/2 – Brading Road	77.6%	7.6	53.2	82.3%	10.9	46.6
4/1 – Great Preston Road – Left Ahead	16.1%	1.8	19.0	23.9%	2.4	24.6
4/2 – Great Preston Road – Entry Right	77.5%	12.0	32.9	86.1%	12.8	47.7
PRC	16.0%			4.5%		
Total Delay (pcu/hr)	17.53			23.37		

3.20 As shown in Table 3.6, the proposed junction design is show to operate with greater capacity in both peak periods in comparison to the existing junction. For instance, there is an improvement in the DoS

on all arms to below the 90% threshold in both peak periods, and the PRC increases to 16.0% in the AM peak and to 4.5% in the PM peak. Longer cycle times of 90 and 120 seconds were also tested for this design and are presented in **Tables 3.7** and **3.8**.

Table 3.7 Future Year Assessment: Proposed Junction (90 secs)

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+1/2 – Marlborough Road	60.7%	7.2	37.0	65.0%	10.0	30.4
2/1 – Bullen Road	71.7%	6.3	56.3	82.5%	6.9	77.3
3/1 – Brading Road	42.1%	5.8	11.2	67.6%	12.2	14.1
3/2 – Brading Road	72.7%	7.8	51.5	78.8%	11.4	45.5
4/1 – Great Preston Road – Left Ahead	15.6%	1.9	20.2	22.4%	2.6	25.4
4/2 – Great Preston Road – Entry Right	75.1%	12.8	33.2	80.7%	12.8	42.7
PRC	19.9%			9.0%		
Total Delay (pcu/hr)	17.90			23.23		

3.21 As shown in Table 3.7, lengthening the cycle time to 90 seconds, provides a greater increase in capacity, with the PRC increasing to 19.9% in the AM peak and to 9.0% in the PM peak.

Table 3.8 Future Year Assessment: Proposed Junction (120 secs)

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+1/2 – Marlborough Road	64.6%	9.9	48.8	64.0%	13.1	37.1
2/1 – Bullen Road	68.3%	7.7	64.2	77.7%	7.9	79.9
3/1 – Brading Road	39.5%	6.8	11.3	63.6%	13.9	13.5
3/2 – Brading Road	68.8%	9.6	58.4	78.1%	14.8	51.5
4/1 – Great Preston Road – Left Ahead	14.4%	2.4	23.2	21.4%	3.4	31.0
4/2 – Great Preston Road – Entry Right	69.3%	15.4	35.1	76.9%	15.6	47.0
PRC	29.9%			15.3%		
Total Delay (pcu/hr)	20.46			25.65		

3.22 As shown in Table 3.8, lengthening the cycle time to 120 seconds, provides the greatest increase in capacity, with the PRC increasing to 29.9% in the AM peak and to 15.3% in the PM peak.

Cost/Time Savings Analysis

3.23 A cost savings analysis has been undertaken for the junction based on the delay/time savings as a result of the proposed alterations to the junction. 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.

3.24 To calculate the total cost savings, the average speed at the junction has been assumed as 28mph (45kph) as based on National Statistics. This was then applied to the total time savings to both the AM (07:00-10:00) and PM Peak periods (16:00-19:00). 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 per Peak period, for an average weekday. For the annual cost savings, the total AM and PM Peak cost savings were applied to a total of 253 days (excluding weekends and Bank Holidays), seeing as this assessment only takes into account an average weekday. The results of this assessment are summarised in **Table 3.9** below.

Table 3.9 Estimated Cost/Time Savings Analysis of Junction 10

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)	Average 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
AM Peak (07:00-10:00)	37	33	4	3	1317	16,989	£167.77	£42,445.64
PM Peak (16:00-19:00)	54	48	6	3	1316	23,688	£233.92	£59,181.51
TOTAL						**40,677**	**£401.69**	**£101,627.15**

3.25 As shown in Table 3.9, the estimated cost savings per peak period were £167.77 in the AM Peak and £233.92 in the PM Peak, and thus the overall annual fuel cost savings was estimated to be £101,627.15.

4 Summary and Conclusions

Summary

4.1 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.

4.2 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 is subject to a feasibility study report, with traffic modelling software used to test various proposals in order to identify a range of measures aimed at improving the behaviour and movement of traffic at each junction.

4.3 The Marlborough Road / Great Preston Road signalised crossroads junction is located on the southeastern edge of Ryde, approximately 2km southeast of Ryde town centre. The A3055 Marlborough Road forms the northern arm, A3055 Brading Road forms the southern arm, Great Preston Road forms the western arm and Bullen Road forms the eastern arm.

4.4 The junction provides access to Ryde to the north and west, Tesco Extra, Sandown and Shanklin to the south and the town of Seaview to the east. At present, the junction is known to experience congestion and queuing, which has been observed during site visits and traffic video surveys at the junction. It was observed that congestion and queuing is particularly evident on the A3055 Marlborough Road and A3055 Brading Road.

4.5 LinSig v3 is the latest version of JCT's industry-standard software for modelling signalised junctions and urban road networks and has therefore been used to model this junction. 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. indicate that the junction operates within recommended capacity during the AM and PM Peaks. The junction operates with a PRC of 26.7% in the AM Peak, whilst a PRC of 14.5% is recorded in the PM Peak. The highest modelled queues are recorded on Great Preston Road, Brading Road and Marlborough Road.

4.6 It is shown that whilst the junction operates within capacity, some arms are approaching a DoS of 90%, in particular Great Preston Road and Bullen Road. On Great Preston Road, a DoS of 70.4% is recorded in the AM Peak, whilst a DoS of 78.6% is recorded in the PM Peak. On Bullen Road, a DoS of 71.1% is recorded in the AM Peak and 72.8% in the PM Peak.

4.7 In terms of a proposed scheme for the junction, a proposed junction design was tested and it was found that due to space constraints at the junction, there is little that can be done in regards to physical improvements, without land acquisition along the northern side of Great Preston Road. Therefore, as a result, non-physical alterations such as lengthening the cycle time were tested as part of the modelling with the existing junction layout remaining unchanged.

4.8 Cycle times of 90 and 120 seconds were tested for the 2034 Future Year, the results concluded that a cycle time of 120 seconds offers the most improvement in capacity, with an increase of 11.2% in capacity in the AM peak and an increase of 6.1% in the PM Peak, compared to the existing cycle time of 80 seconds.

4.9 A proposed indicative junction design which incorporates land acquisition along the northern side of Great Preston Road, which includes a two-lane approach on the Great Preston Road arm, was tested as part of the traffic modelling. This design provides more significant capacity improvements, as

opposed to solely lengthening the cycle time at the existing junction. The proposed design records a PRC of 16.0% in the AM peak and a PRC of 4.5% in the PM peak, whilst in combination with a longer cycle time of 90 seconds, the PRC increases to 19.9% in the AM and 9.0% in the PM. Furthermore, with a cycle time of 120 seconds, the PRC reaches an optimum of 29.9% in the AM and 15.3% in the PM.

Conclusions

4.10 The outcome of the modelling scenarios demonstrates that there is some benefit to the junction by lengthening the cycle time. There is an improvement in capacity at the junction for the future year scenarios. A proposed indicative junction design which incorporates land acquisition along the northern side of Great Preston Road, which includes a two-lane approach on the Great Preston Road arm, was tested as part of the traffic modelling. This design provides more significant capacity improvements, as opposed to solely lengthening the cycle time at the existing junction. It was found that in combination with a longer cycle time of 90 and 120 seconds, the proposed design would operate with the best capacity in both peak periods. Therefore, the proposed design should be considered in order to fully address capacity issues at this junction.

Appendix A
MODELLING OUTPUT RESULTS

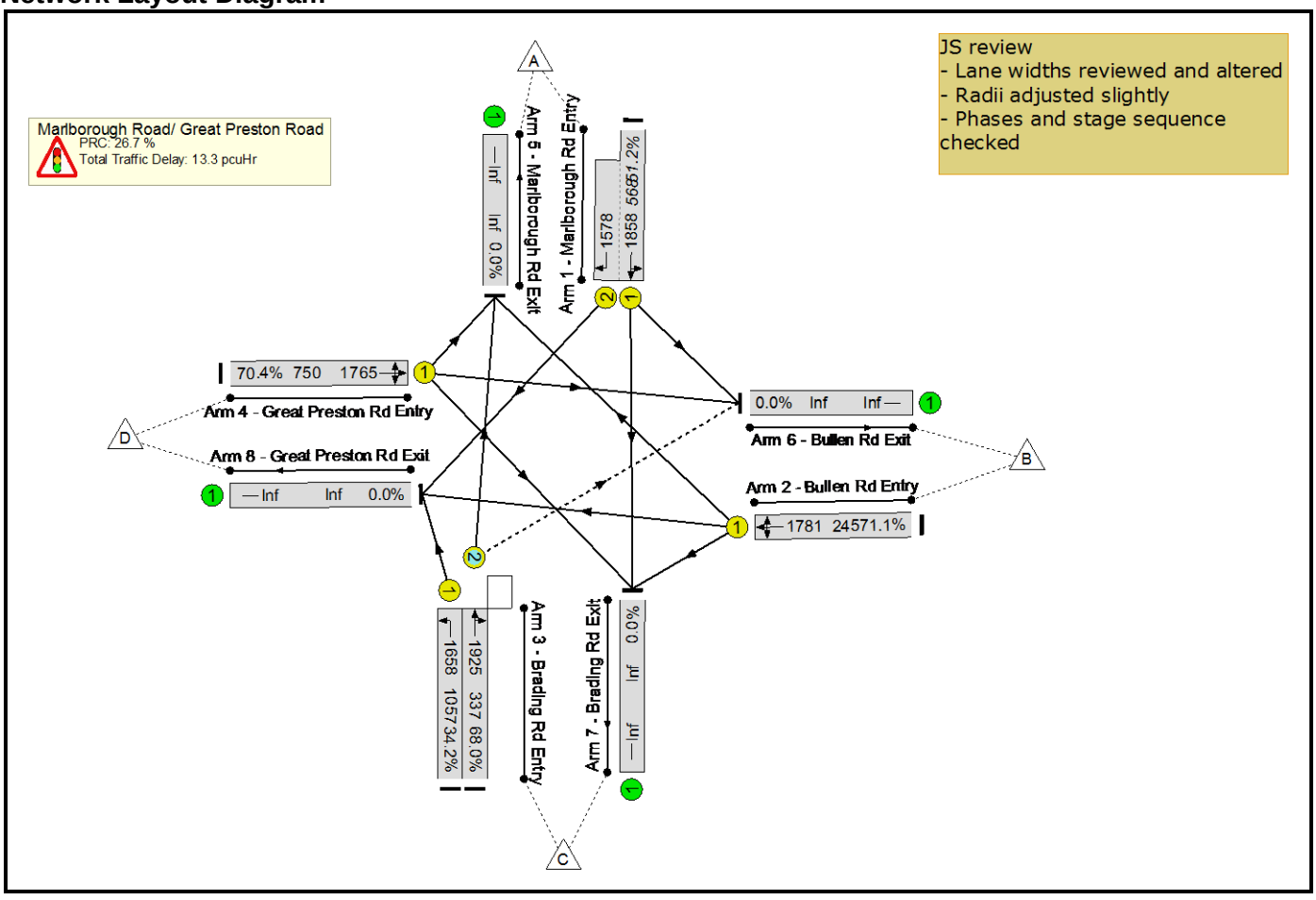
Basic Results Summary

User and Project Details

Project:	
Title:	
Location:	
Additional detail:	
File name:	Juntion 10 Marlborough Rd - Great Preston Rd Crossroads.lsg3x
Author:	
Company:	
Address:	

Scenario 1: '2017 AM Base' (FG1: '2017 AM Peak', 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%**	**29**	**0**	**0**	**13.3**	-	-
Marlborough Road/ Great Preston Road	-	-	-		-	-	-	-	-	-	**71.1%**	**29**	**0**	**0**	**13.3**	-	-
1/1+1/2	Marlborough Rd Entry Left Ahead Right	U	A B		1	21:4	-	291	1858:1578	568	51.2%	-	-	-	2.6	32.4	5.2
2/1	Bullen Rd Entry Right Left Ahead	U	C		1	10	-	174	1781	245	71.1%	-	-	-	2.8	57.6	4.9
3/1	Brading Rd Entry Left	U	D	E	1	50	37	362	1658	1057	34.2%	-	-	-	0.9	9.3	4.0
3/2	Brading Rd Entry Ahead Right	O	D		1	13	-	229	1925	337	68.0%	29	0	0	3.1	48.1	5.7
4/1	Great Preston Rd Entry Left Ahead Right	U	F		1	33	-	528	1765	750	70.4%	-	-	-	3.9	26.9	10.7

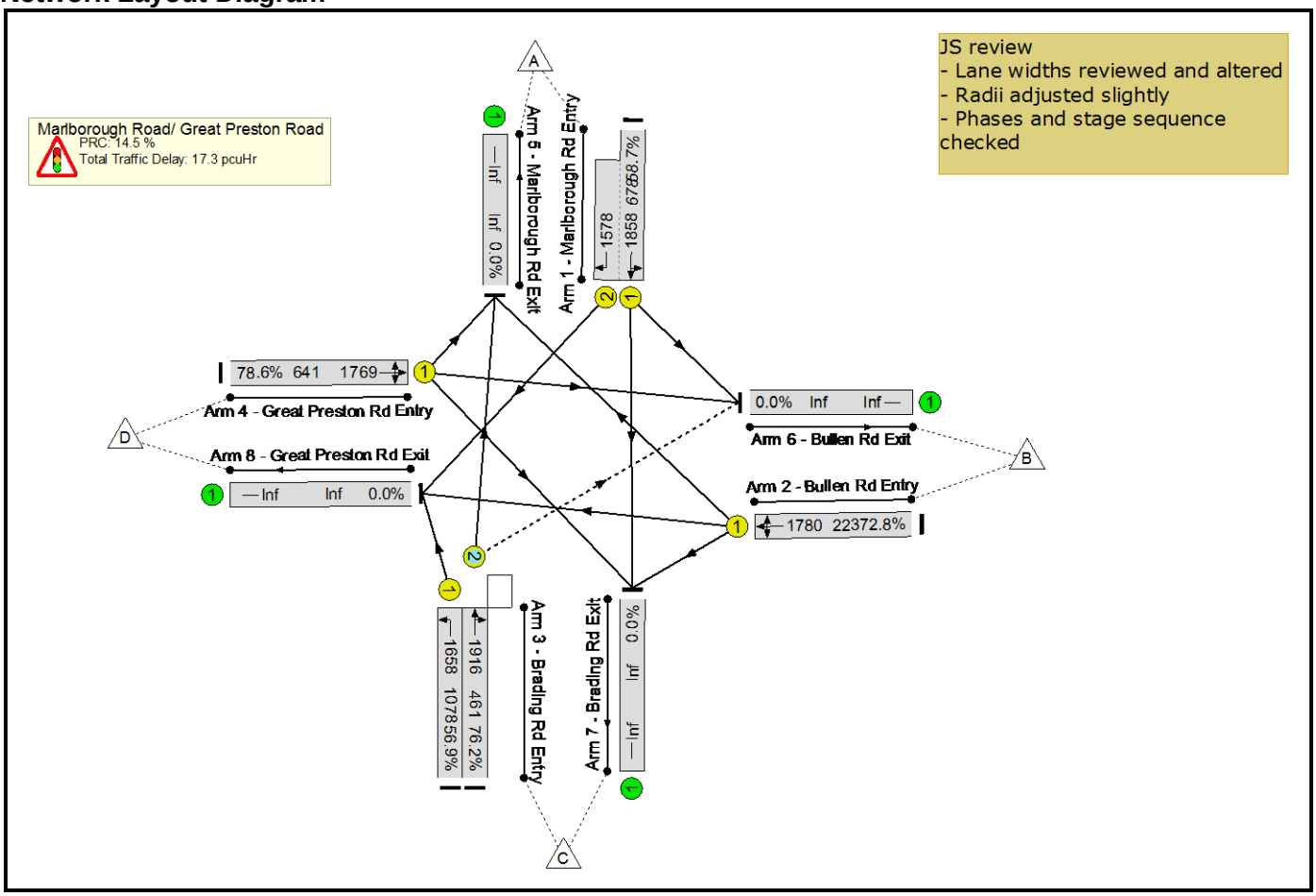
C1 PRC for Signalled Lanes (%): 26.7 Total Delay for Signalled Lanes (pcuHr): 13.34 Cycle Time (s): 80

PRC Over All Lanes (%): 26.7 Total Delay Over All Lanes(pcuHr): 13.34

Basic Results Summary

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

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	**78.6%**	**57**	**0**	**0**	**17.3**	-	-
Marlborough Road/ Great Preston Road	-	-	-		-	-	-	-	-	-	**78.6%**	**57**	**0**	**0**	**17.3**	-	-
1/1+1/2	Marlborough Rd Entry Left Ahead Right	U	A B		1	27:4	-	398	1858:1578	678	58.7%	-	-	-	3.2	28.5	7.3
2/1	Bullen Rd Entry Right Left Ahead	U	C		1	9	-	162	1780	223	72.8%	-	-	-	2.8	62.2	4.7
3/1	Brading Rd Entry Left	U	D	E	1	51	32	613	1658	1078	56.9%	-	-	-	2.0	11.6	8.1
3/2	Brading Rd Entry Ahead Right	O	D		1	19	-	351	1916	461	76.2%	57	0	0	4.4	44.9	8.7
4/1	Great Preston Rd Entry Left Ahead Right	U	F		1	28	-	504	1769	641	78.6%	-	-	-	5.0	35.5	11.7

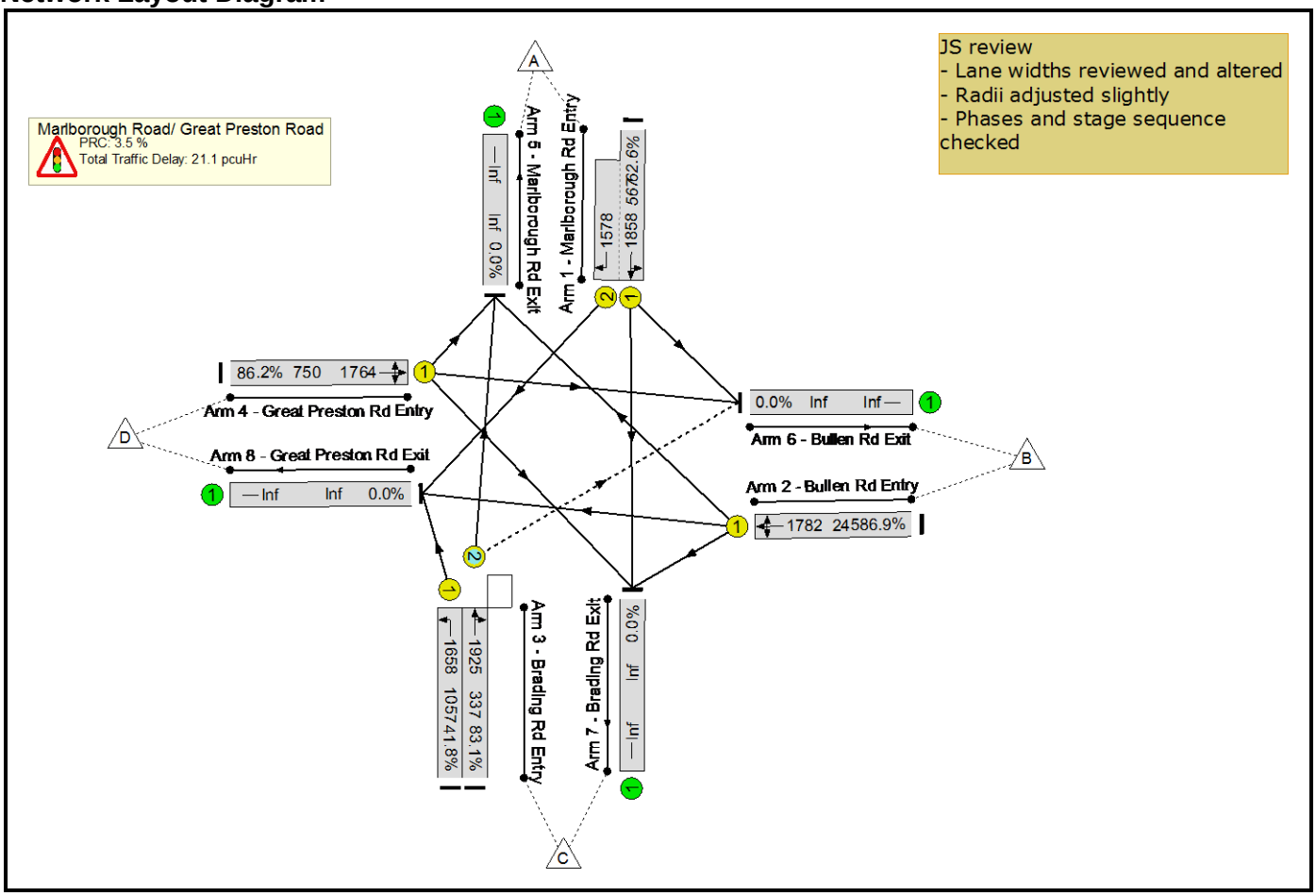
C1 PRC for Signalled Lanes (%): 14.5 Total Delay for Signalled Lanes (pcuHr): 17.29 Cycle Time (s): 80

PRC Over All Lanes (%): 14.5 Total Delay Over All Lanes(pcuHr): 17.29

Basic Results Summary

Scenario 3: '2034 AM DN' (FG3: '2034: AM Peak', 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	-	-	-		-	-	-	-	-	-	**86.9%**	**35**	**0**	**0**	**21.1**	-	-
Marlborough Road/ Great Preston Road	-	-	-		-	-	-	-	-	-	**86.9%**	**35**	**0**	**0**	**21.1**	-	-
1/1+1/2	Marlborough Rd Entry Left Ahead Right	U	A B		1	21:4	-	355	1858:1578	567	62.6%	-	-	-	3.5	35.1	6.7
2/1	Bullen Rd Entry Right Left Ahead	U	C		1	10	-	213	1782	245	86.9%	-	-	-	4.8	81.6	7.4
3/1	Brading Rd Entry Left	U	D	E	1	50	37	442	1658	1057	41.8%	-	-	-	1.2	10.1	5.1
3/2	Brading Rd Entry Ahead Right	O	D		1	13	-	280	1925	337	83.1%	35	0	0	4.8	62.2	8.3
4/1	Great Preston Rd Entry Left Ahead Right	U	F		1	33	-	646	1764	750	86.2%	-	-	-	6.7	37.3	15.9

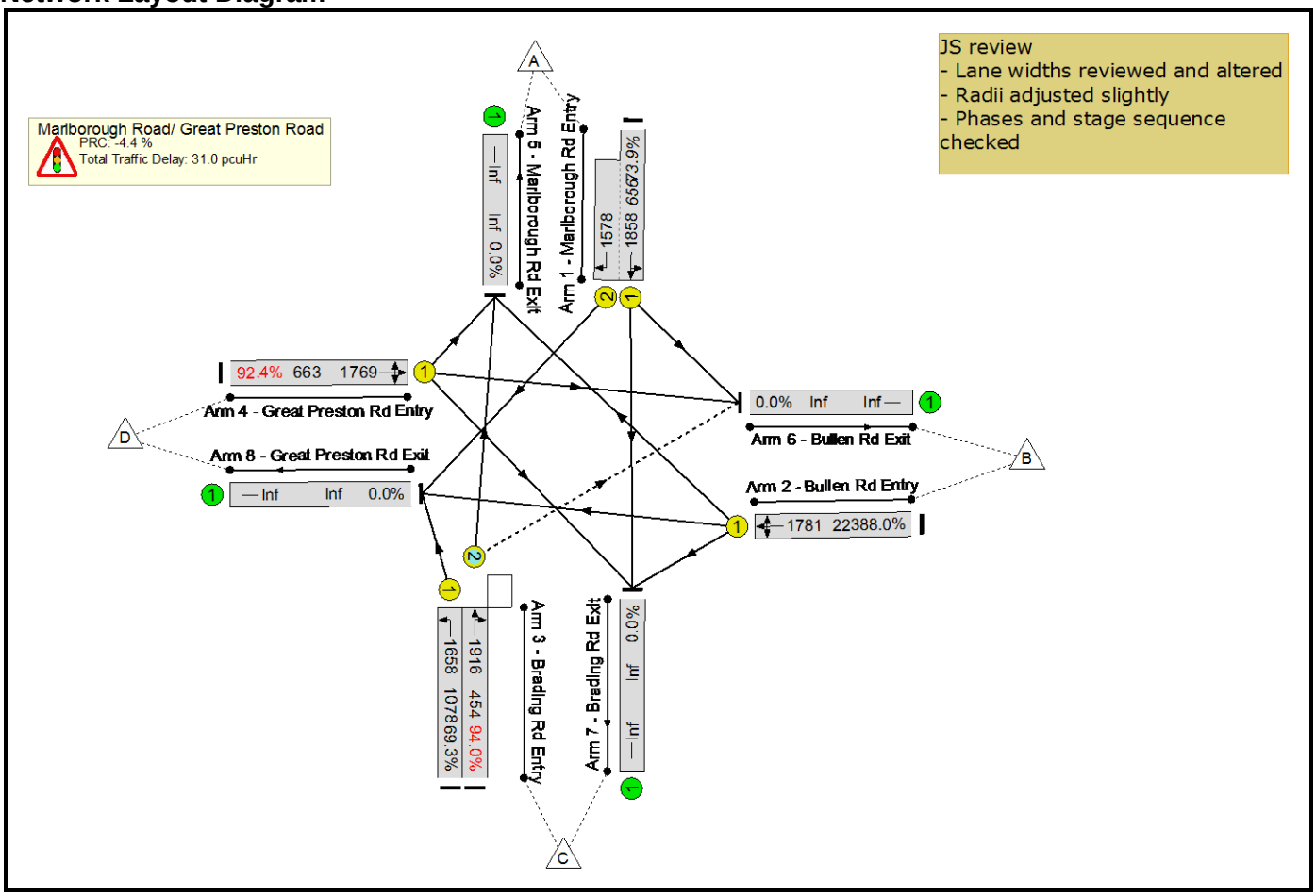
C1 PRC for Signalled Lanes (%): 3.5 Total Delay for Signalled Lanes (pcuHr): 21.06 Cycle Time (s): 80

PRC Over All Lanes (%): 3.5 Total Delay Over All Lanes(pcuHr): 21.06

Basic Results Summary

Scenario 4: '2034 PM DN' (FG4: '2034: PM Peak', 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	-	-	-		-	-	-	-	-	-	**94.0%**	**69**	**0**	**0**	**31.0**	-	-
Marlborough Road/ Great Preston Road	-	-	-		-	-	-	-	-	-	**94.0%**	**69**	**0**	**0**	**31.0**	-	-
1/1+1/2	Marlborough Rd Entry Left Ahead Right	U	A B		1	26:4	-	485	1858:1578	656	73.9%	-	-	-	4.6	34.5	10.2
2/1	Bullen Rd Entry Right Left Ahead	U	C		1	9	-	196	1781	223	88.0%	-	-	-	4.9	89.6	7.2
3/1	Brading Rd Entry Left	U	D	E	1	51	33	747	1658	1078	69.3%	-	-	-	3.0	14.3	11.5
3/2	Brading Rd Entry Ahead Right	O	D		1	18	-	427	1916	454	94.0%	69	0	0	9.3	78.6	14.8
4/1	Great Preston Rd Entry Left Ahead Right	U	F		1	29	-	613	1769	663	92.4%	-	-	-	9.1	53.7	18.0

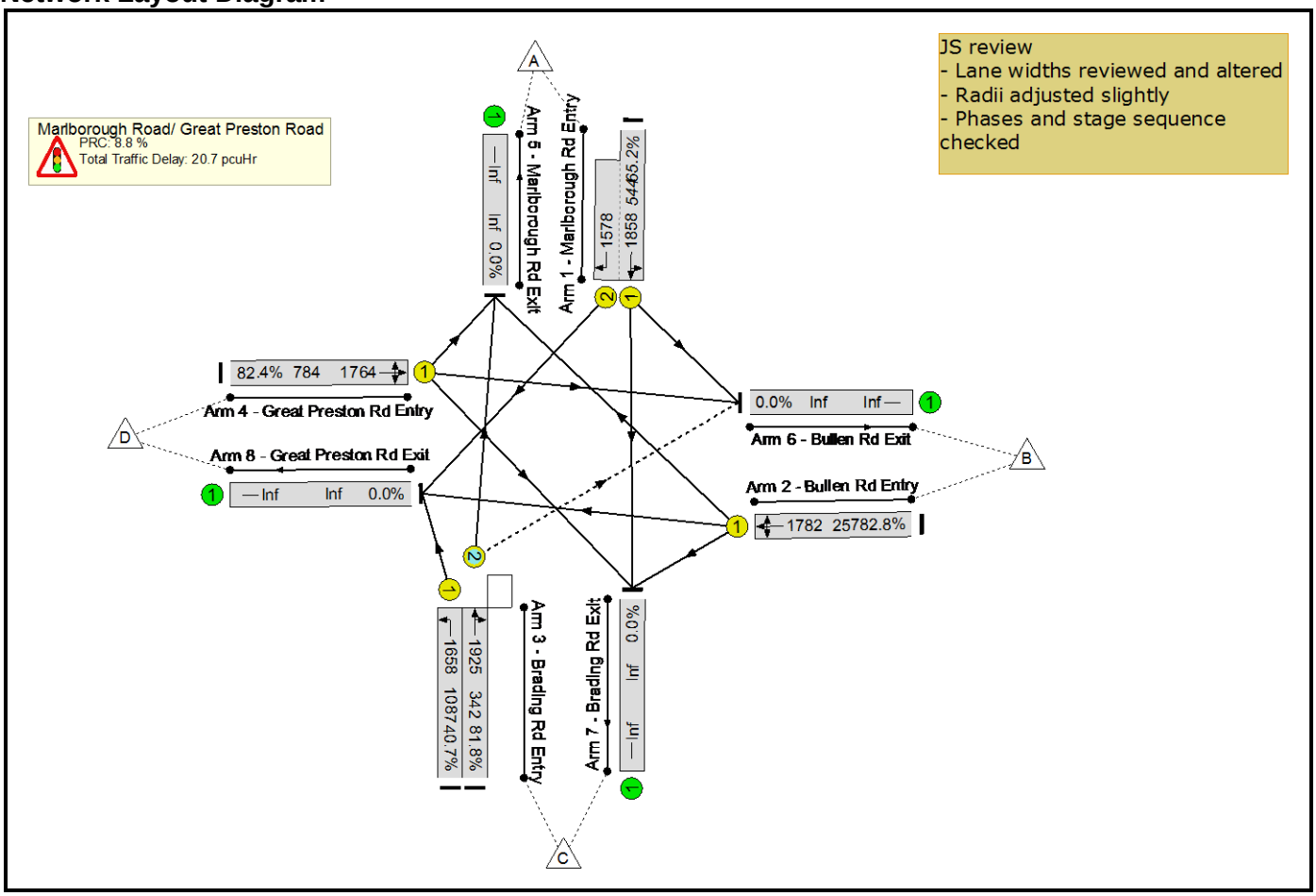
C1 PRC for Signalled Lanes (%): -4.4 Total Delay for Signalled Lanes (pcuHr): 30.96 Cycle Time (s): 80

PRC Over All Lanes (%): -4.4 Total Delay Over All Lanes(pcuHr): 30.96

Basic Results Summary

Scenario 5: '2034 AM DN (90 secs)' (FG3: '2034: AM Peak', 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	-	-	-		-	-	-	-	-	-	**82.8%**	**35**	**0**	**0**	**20.7**	-	-
Marlborough Road/ Great Preston Road	-	-	-		-	-	-	-	-	-	**82.8%**	**35**	**0**	**0**	**20.7**	-	-
1/1+1/2	Marlborough Rd Entry Left Ahead Right	U	A B		1	23:4	-	355	1858:1578	544	65.2%	-	-	-	4.0	40.1	7.7
2/1	Bullen Rd Entry Right Left Ahead	U	C		1	12	-	213	1782	257	82.8%	-	-	-	4.4	74.3	7.3
3/1	Brading Rd Entry Left	U	D	E	1	58	43	442	1658	1087	40.7%	-	-	-	1.2	10.1	5.5
3/2	Brading Rd Entry Ahead Right	O	D		1	15	-	280	1925	342	81.8%	35	0	0	5.0	63.8	8.8
4/1	Great Preston Rd Entry Left Ahead Right	U	F		1	39	-	646	1764	784	82.4%	-	-	-	6.2	34.5	16.3

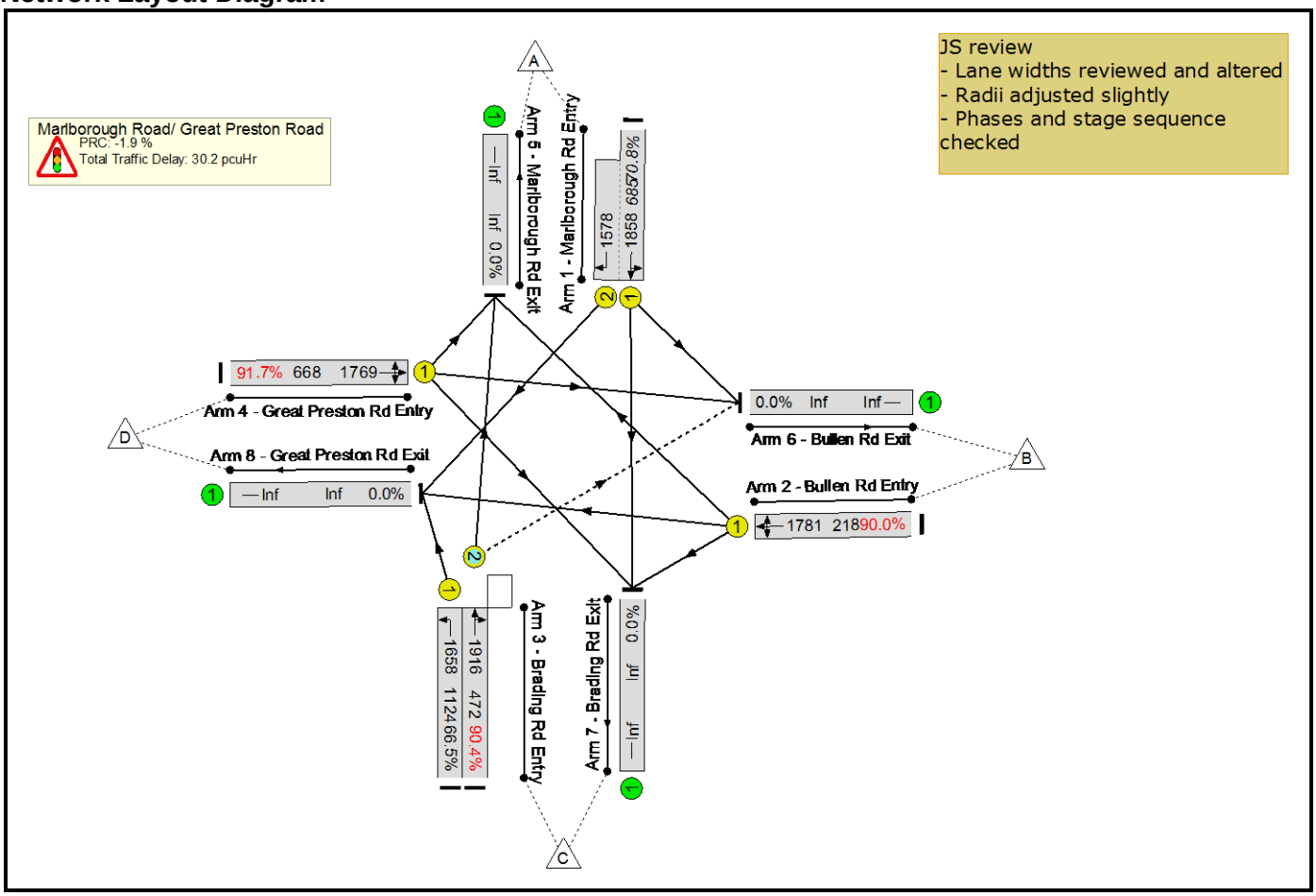
C1 PRC for Signalled Lanes (%): 8.8 Total Delay for Signalled Lanes (pcuHr): 20.75 Cycle Time (s): 90

PRC Over All Lanes (%): 8.8 Total Delay Over All Lanes(pcuHr): 20.75

Basic Results Summary

Scenario 6: '2034 PM DN (90 secs)' (FG4: '2034: PM Peak', 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	-	-	-		-	-	-	-	-	-	**91.7%**	**69**	**0**	**0**	**30.2**	-	-
Marlborough Road/ Great Preston Road	-	-	-		-	-	-	-	-	-	**91.7%**	**69**	**0**	**0**	**30.2**	-	-
1/1+1/2	Marlborough Rd Entry Left Ahead Right	U	A B		1	31:4	-	485	1858:1578	685	70.8%	-	-	-	4.7	34.7	10.8
2/1	Bullen Rd Entry Right Left Ahead	U	C		1	10	-	196	1781	218	90.0%	-	-	-	5.6	102.0	8.2
3/1	Brading Rd Entry Left	U	D	E	1	60	37	747	1658	1124	66.5%	-	-	-	2.8	13.3	11.8
3/2	Brading Rd Entry Ahead Right	O	D		1	23	-	427	1916	472	90.4%	69	0	0	8.0	67.0	14.0
4/1	Great Preston Rd Entry Left Ahead Right	U	F		1	33	-	613	1769	668	91.7%	-	-	-	9.3	54.5	19.2

C1

PRC for Signalled Lanes (%): -1.9
PRC Over All Lanes (%): -1.9

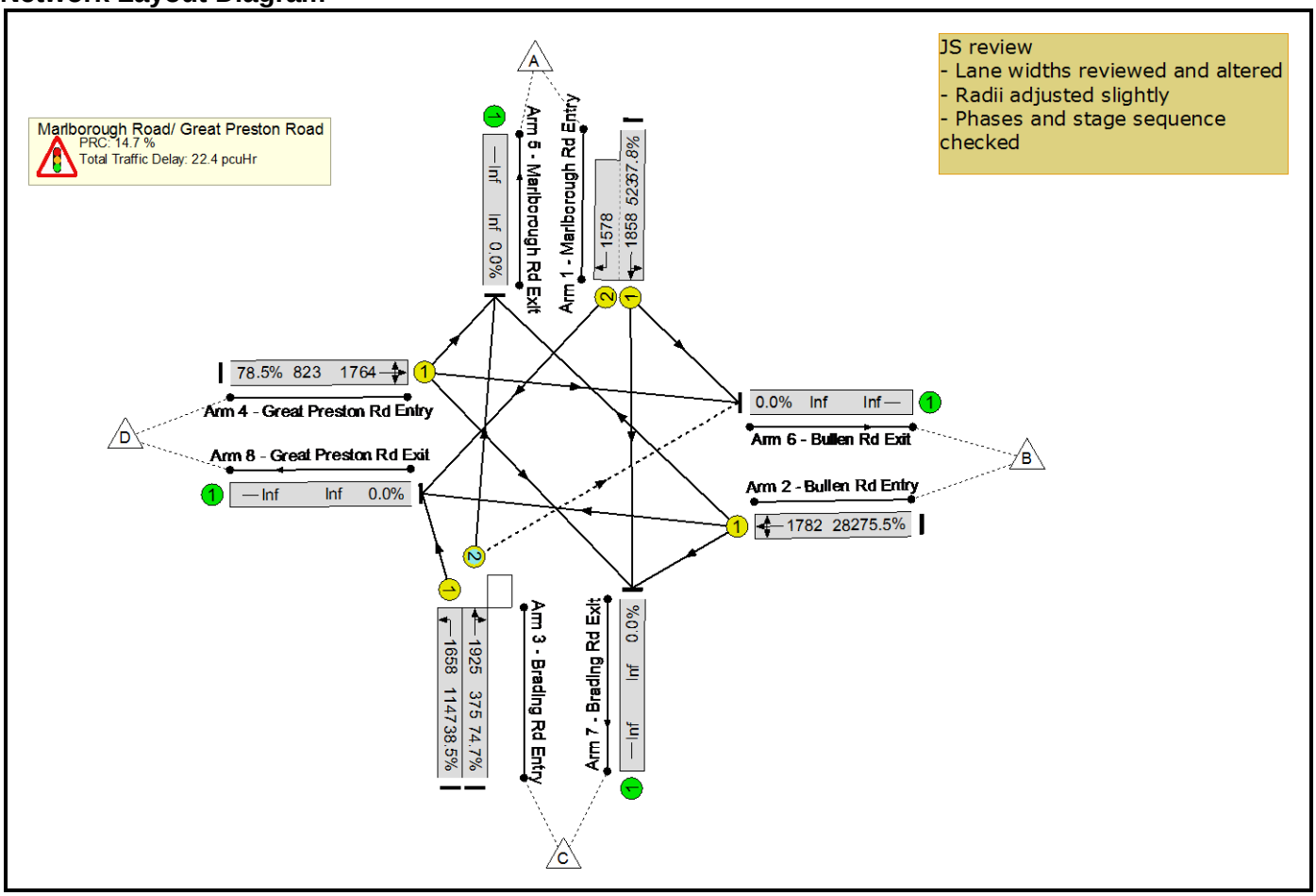
Total Delay for Signalled Lanes (pcuHr): 30.21
Total Delay Over All Lanes(pcuHr): 30.21

Cycle Time (s): 90

Basic Results Summary

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

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	**78.5%**	**35**	**0**	**0**	**22.4**	-	-
Marlborough Road/ Great Preston Road	-	-	-		-	-	-	-	-	-	**78.5%**	**35**	**0**	**0**	**22.4**	-	-
1/1+1/2	Marlborough Rd Entry Left Ahead Right	U	A B		1	31:4	-	355	1858:1578	523	67.8%	-	-	-	5.1	51.7	10.2
2/1	Bullen Rd Entry Right Left Ahead	U	C		1	18	-	213	1782	282	75.5%	-	-	-	4.3	73.2	8.2
3/1	Brading Rd Entry Left	U	D	E	1	82	59	442	1658	1147	38.5%	-	-	-	1.3	10.3	6.5
3/2	Brading Rd Entry Ahead Right	O	D		1	23	-	280	1925	375	74.7%	35	0	0	5.0	64.8	10.1
4/1	Great Preston Rd Entry Left Ahead Right	U	F		1	55	-	646	1764	823	78.5%	-	-	-	6.6	36.9	19.7

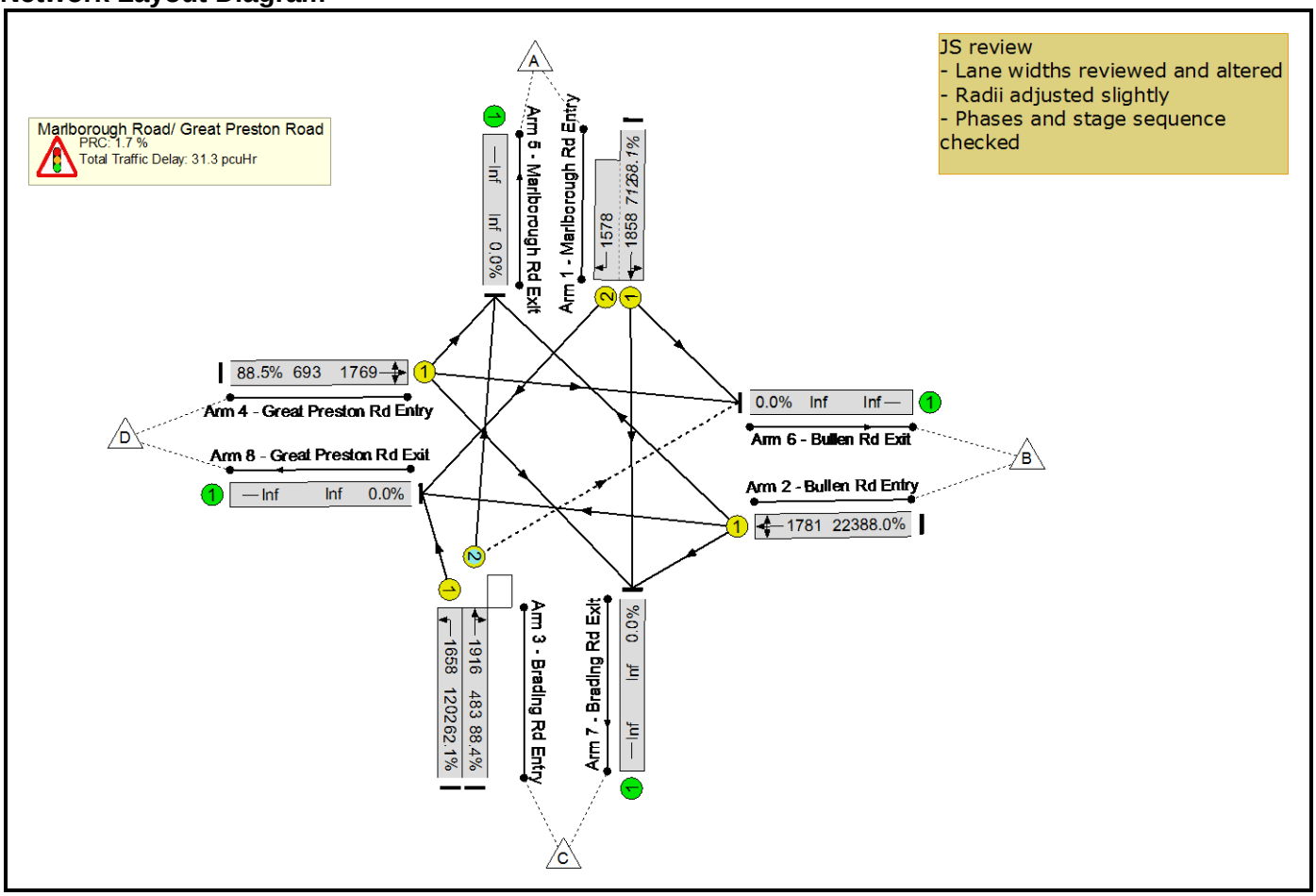
C1 PRC for Signalled Lanes (%): 14.7 Total Delay for Signalled Lanes (pcuHr): 22.36 Cycle Time (s): 120

PRC Over All Lanes (%): 14.7 Total Delay Over All Lanes(pcuHr): 22.36

Basic Results Summary

Scenario 8: '2034 PM DN (120 secs)' (FG4: '2034: PM Peak', 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	-	-	-		-	-	-	-	-	-	**88.5%**	**69**	**0**	**0**	**31.3**	-	-
Marlborough Road/ Great Preston Road	-	-	-		-	-	-	-	-	-	**88.5%**	**69**	**0**	**0**	**31.3**	-	-
1/1+1/2	Marlborough Rd Entry Left Ahead Right	U	A B		1	44:4	-	485	1858:1578	712	68.1%	-	-	-	5.5	40.7	13.8
2/1	Bullen Rd Entry Right Left Ahead	U	C		1	14	-	196	1781	223	88.0%	-	-	-	5.8	106.8	9.4
3/1	Brading Rd Entry Left	U	D	E	1	86	50	747	1658	1202	62.1%	-	-	-	2.5	12.2	13.3
3/2	Brading Rd Entry Ahead Right	O	D		1	36	-	427	1916	483	88.4%	69	0	0	8.1	68.6	17.0
4/1	Great Preston Rd Entry Left Ahead Right	U	F		1	46	-	613	1769	693	88.5%	-	-	-	9.3	54.7	22.4

C1 PRC for Signalled Lanes (%): 1.7 Total Delay for Signalled Lanes (pcuHr): 31.28 Cycle Time (s): 120

PRC Over All Lanes (%): 1.7 Total Delay Over All Lanes(pcuHr): 31.28

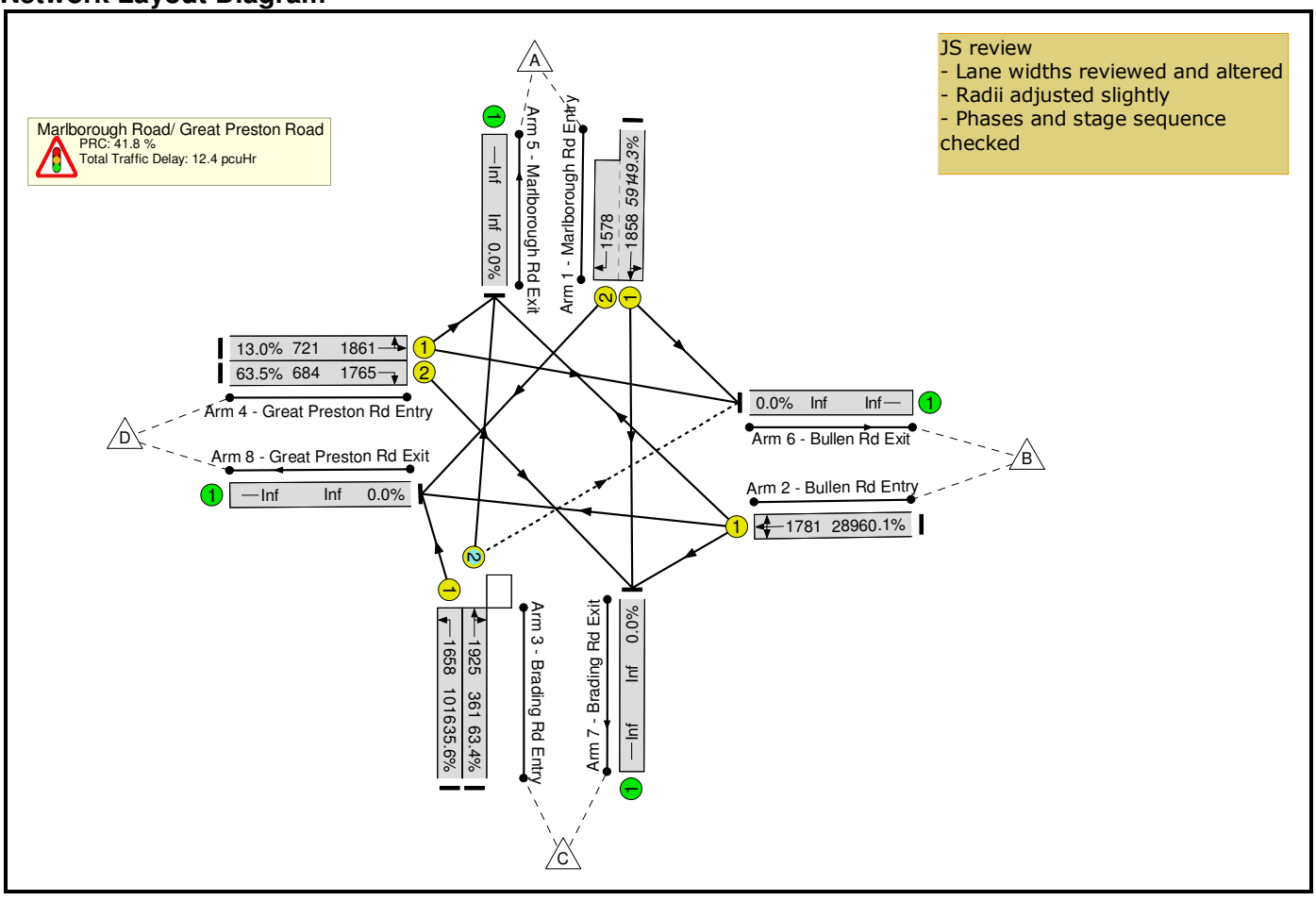
Basic Results Summary

User and Project Details

Project:	
Title:	
Location:	
Additional detail:	
File name:	Juntion 10 Marlborough Rd - Great Preston Rd Crossroads - Proposed.lsg3x
Author:	
Company:	
Address:	

Scenario 1: '2017 AM Base' (FG1: '2017 AM Peak', 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	-	-	-		-	-	-	-	-	-	**63.5%**	**29**	**0**	**0**	**12.4**	-	-
Marlborough Road/ Great Preston Road	-	-	-		-	-	-	-	-	-	**63.5%**	**29**	**0**	**0**	**12.4**	-	-
1/1+1/2	Marlborough Rd Entry Left Ahead Right	U	A B		1	22:4	-	291	1858:1578	591	49.3%	-	-	-	2.5	31.2	5.0
2/1	Bullen Rd Entry Right Left Ahead	U	C		1	12	-	174	1781	289	60.1%	-	-	-	2.2	46.5	4.3
3/1	Brading Rd Entry Left	U	D	E	1	48	34	362	1658	1016	35.6%	-	-	-	1.0	10.4	4.2
3/2	Brading Rd Entry Ahead Right	O	D		1	14	-	229	1925	361	63.4%	29	0	0	2.8	44.2	5.5
4/1	Great Preston Rd Entry Left Ahead	U	F		1	30	-	94	1861	721	13.0%	-	-	-	0.5	18.7	1.4
4/2	Great Preston Rd Entry Right	U	F		1	30	-	434	1765	684	63.5%	-	-	-	3.3	27.1	8.6

C1

PRC for Signalled Lanes (%): 41.8
PRC Over All Lanes (%): 41.8

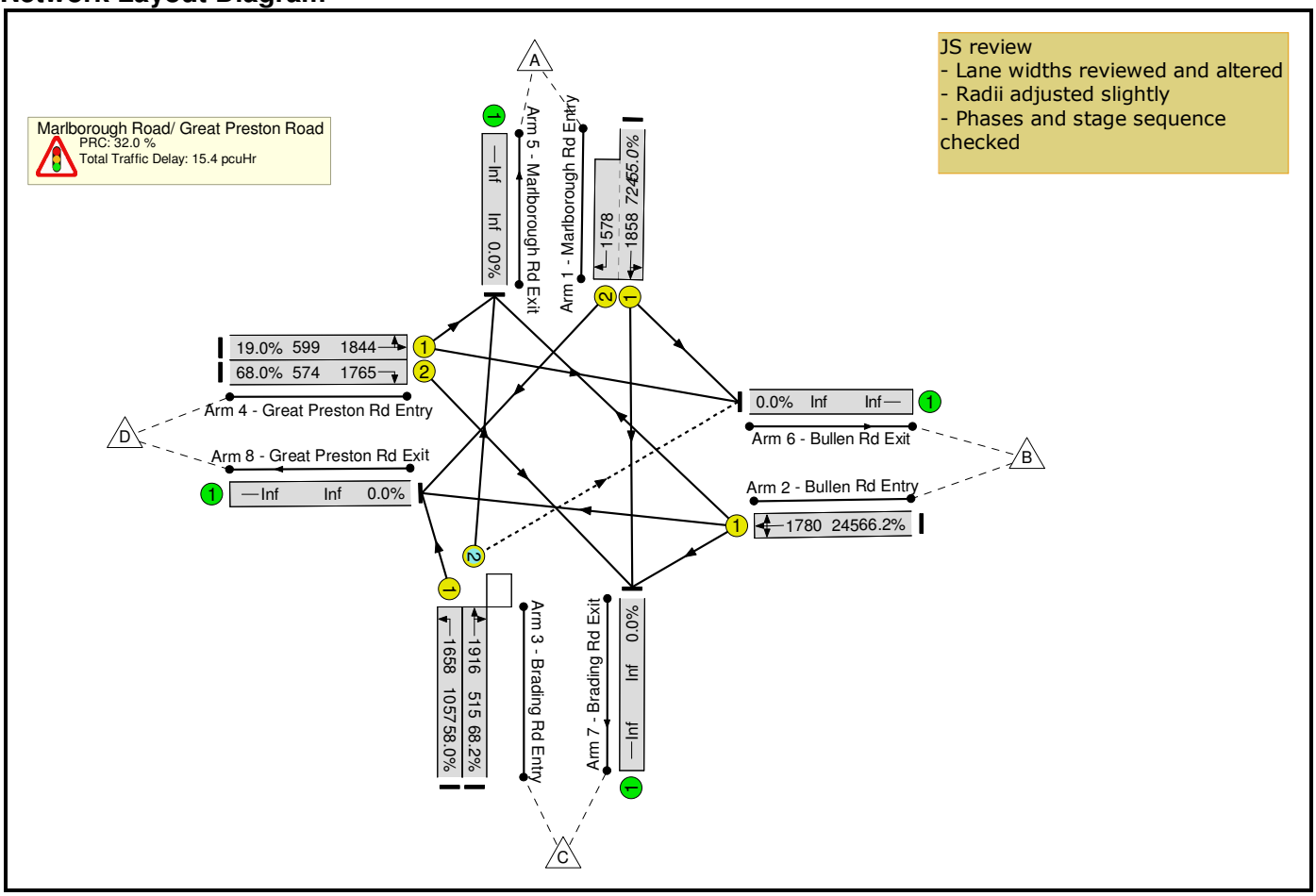
Total Delay for Signalled Lanes (pcuHr): 12.38
Total Delay Over All Lanes(pcuHr): 12.38

Cycle Time (s): 80

Basic Results Summary

Scenario 2: '2017 PM Base' (FG2: '2017 PM Peak', 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	-	-	-		-	-	-	-	-	-	**68.2%**	**57**	**0**	**0**	**15.4**	-	-
Marlborough Road/ Great Preston Road	-	-	-		-	-	-	-	-	-	**68.2%**	**57**	**0**	**0**	**15.4**	-	-
1/1+1/2	Marlborough Rd Entry Left Ahead Right	U	A B		1	29:4	-	398	1858:1578	724	55.0%	-	-	-	2.9	26.2	7.0
2/1	Bullen Rd Entry Right Left Ahead	U	C		1	10	-	162	1780	245	66.2%	-	-	-	2.4	54.0	4.3
3/1	Brading Rd Entry Left	U	D	E	1	50	29	613	1658	1057	58.0%	-	-	-	2.1	12.4	8.5
3/2	Brading Rd Entry Ahead Right	O	D		1	21	-	351	1916	515	68.2%	57	0	0	3.7	37.9	8.0
4/1	Great Preston Rd Entry Left Ahead	U	F		1	25	-	114	1844	599	19.0%	-	-	-	0.7	23.2	1.9
4/2	Great Preston Rd Entry Right	U	F		1	25	-	390	1765	574	68.0%	-	-	-	3.6	33.1	8.5

C1

PRC for Signalled Lanes (%): 32.0
PRC Over All Lanes (%): 32.0

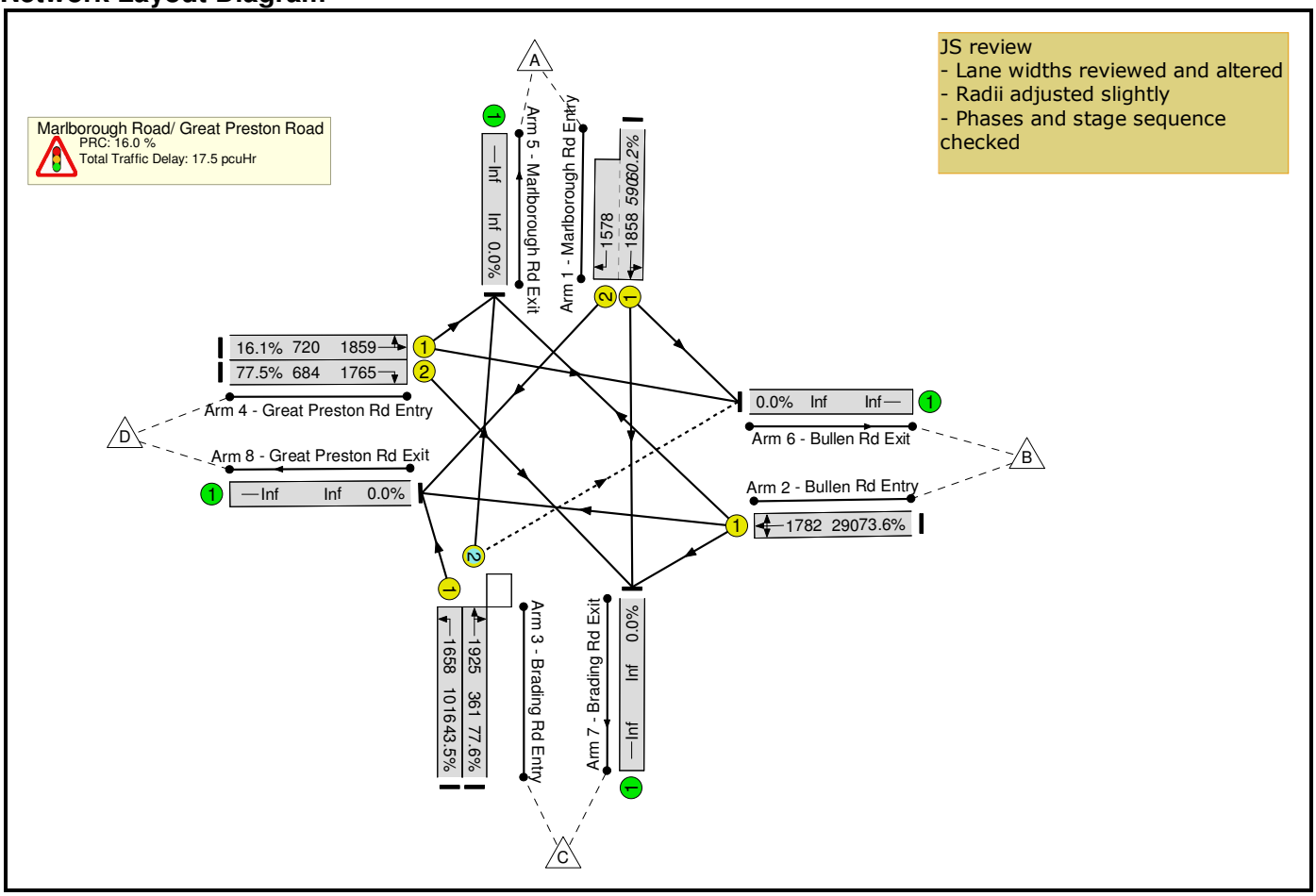
Total Delay for Signalled Lanes (pcuHr): 15.45
Total Delay Over All Lanes(pcuHr): 15.45

Cycle Time (s): 80

Basic Results Summary

Scenario 3: '2034 AM Base' (FG3: '2034: AM Peak', 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	-	-	-		-	-	-	-	-	-	**77.6%**	**35**	**0**	**0**	**17.5**	-	-
Marlborough Road/ Great Preston Road	-	-	-		-	-	-	-	-	-	**77.6%**	**35**	**0**	**0**	**17.5**	-	-
1/1+1/2	Marlborough Rd Entry Left Ahead Right	U	A B		1	22:4	-	355	1858:1578	590	60.2%	-	-	-	3.3	33.6	6.6
2/1	Bullen Rd Entry Right Left Ahead	U	C		1	12	-	213	1782	290	73.6%	-	-	-	3.2	54.6	5.8
3/1	Brading Rd Entry Left	U	D	E	1	48	34	442	1658	1016	43.5%	-	-	-	1.4	11.3	5.5
3/2	Brading Rd Entry Ahead Right	O	D		1	14	-	280	1925	361	77.6%	35	0	0	4.1	53.2	7.6
4/1	Great Preston Rd Entry Left Ahead	U	F		1	30	-	116	1859	720	16.1%	-	-	-	0.6	19.0	1.8
4/2	Great Preston Rd Entry Right	U	F		1	30	-	530	1765	684	77.5%	-	-	-	4.8	32.9	12.0

C1

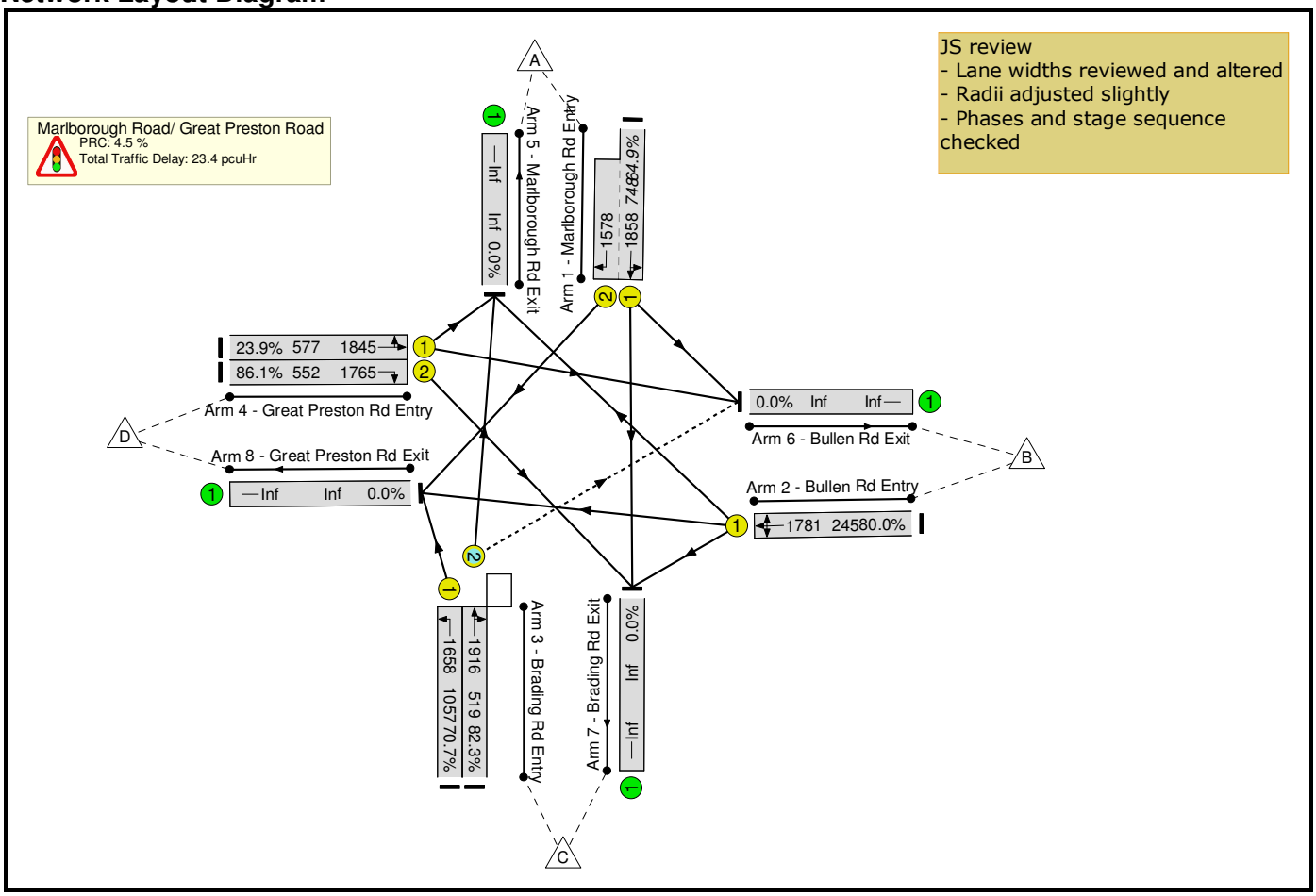
PRC for Signalled Lanes (%): 16.0 | Total Delay for Signalled Lanes (pcuHr): 17.53 | Cycle Time (s): 80

PRC Over All Lanes (%): 16.0 | Total Delay Over All Lanes(pcuHr): 17.53

Basic Results Summary

Scenario 4: '2034 PM Base' (FG4: '2034: PM Peak', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

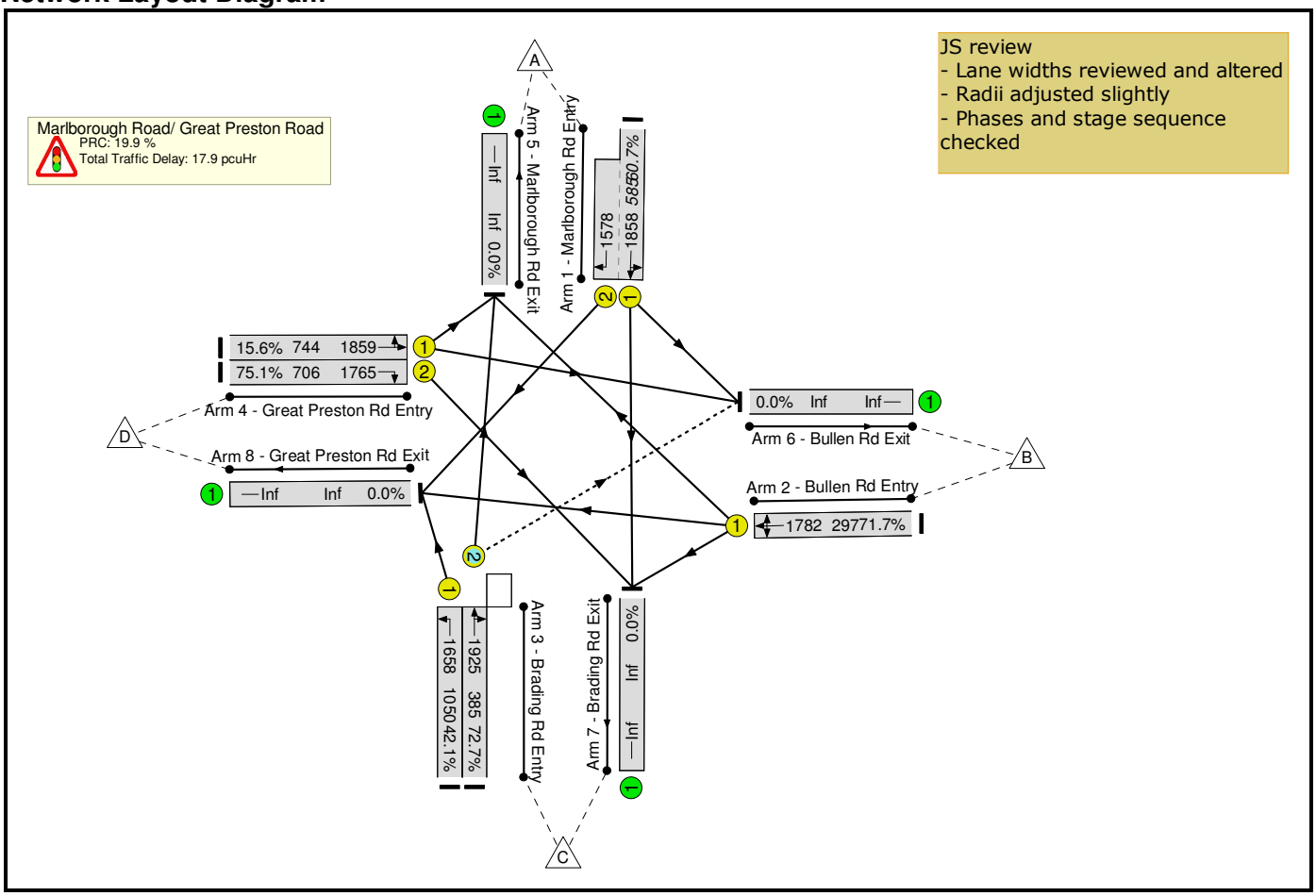
Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	**86.1%**	**69**	**0**	**0**	**23.4**	-	-
Marlborough Road/ Great Preston Road	-	-	-		-	-	-	-	-	-	**86.1%**	**69**	**0**	**0**	**23.4**	-	-
1/1+1/2	Marlborough Rd Entry Left Ahead Right	U	A B		1	30:4	-	485	1858:1578	748	64.9%	-	-	-	3.7	27.8	9.0
2/1	Bullen Rd Entry Right Left Ahead	U	C		1	10	-	196	1781	245	80.0%	-	-	-	3.7	67.7	6.1
3/1	Brading Rd Entry Left	U	D	E	1	50	28	747	1658	1057	70.7%	-	-	-	3.2	15.3	12.0
3/2	Brading Rd Entry Ahead Right	O	D		1	22	-	427	1916	519	82.3%	69	0	0	5.5	46.6	10.9
4/1	Great Preston Rd Entry Left Ahead	U	F		1	24	-	138	1845	577	23.9%	-	-	-	0.9	24.6	2.4
4/2	Great Preston Rd Entry Right	U	F		1	24	-	475	1765	552	86.1%	-	-	-	6.3	47.7	12.8

C1	PRC for Signalled Lanes (%):	4.5	Total Delay for Signalled Lanes (pcuHr):	23.37	Cycle Time (s):	80	
	PRC Over All Lanes (%):	4.5	Total Delay Over All Lanes(pcuHr):	23.37			

Basic Results Summary

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

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	**75.1%**	**35**	**0**	**0**	**17.9**	-	-
Marlborough Road/ Great Preston Road	-	-	-		-	-	-	-	-	-	**75.1%**	**35**	**0**	**0**	**17.9**	-	-
1/1+1/2	Marlborough Rd Entry Left Ahead Right	U	A B		1	25:4	-	355	1858:1578	585	60.7%	-	-	-	3.6	37.0	7.2
2/1	Bullen Rd Entry Right Left Ahead	U	C		1	14	-	213	1782	297	71.7%	-	-	-	3.3	56.3	6.3
3/1	Brading Rd Entry Left	U	D	E	1	56	39	442	1658	1050	42.1%	-	-	-	1.4	11.2	5.8
3/2	Brading Rd Entry Ahead Right	O	D		1	17	-	280	1925	385	72.7%	35	0	0	4.0	51.5	7.8
4/1	Great Preston Rd Entry Left Ahead	U	F		1	35	-	116	1859	744	15.6%	-	-	-	0.6	20.2	1.9
4/2	Great Preston Rd Entry Right	U	F		1	35	-	530	1765	706	75.1%	-	-	-	4.9	33.2	12.8

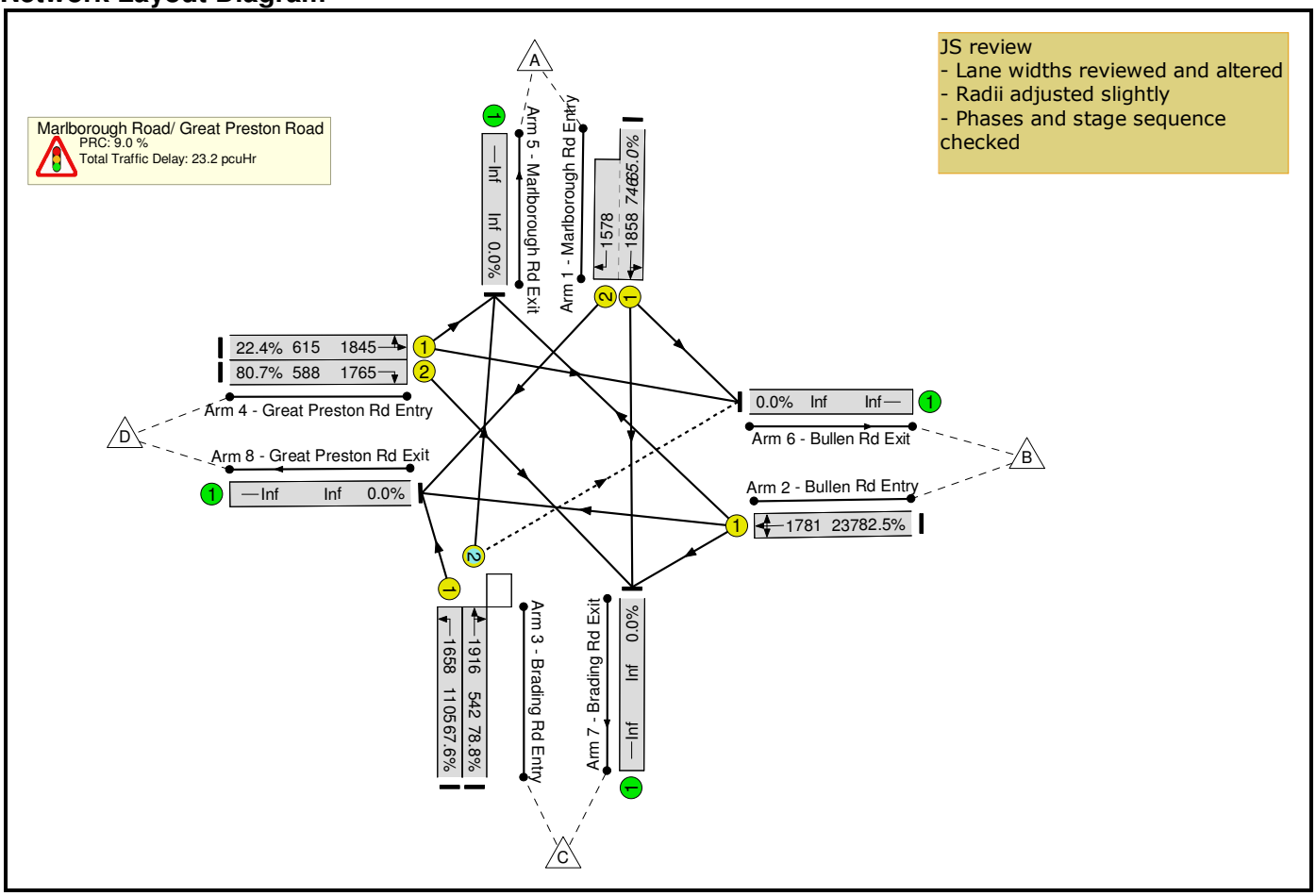
C1 PRC for Signalled Lanes (%): 19.9 Total Delay for Signalled Lanes (pcuHr): 17.90 Cycle Time (s): 90

PRC Over All Lanes (%): 19.9 Total Delay Over All Lanes(pcuHr): 17.90

Basic Results Summary

Scenario 6: '2034 PM DS (90 secs)' (FG4: '2034: PM Peak', 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	-	-	-		-	-	-	-	-	-	**82.5%**	**69**	**0**	**0**	**23.2**	-	-
Marlborough Road/ Great Preston Road	-	-	-		-	-	-	-	-	-	**82.5%**	**69**	**0**	**0**	**23.2**	-	-
1/1+1/2	Marlborough Rd Entry Left Ahead Right	U	A B		1	34:4	-	485	1858:1578	746	65.0%	-	-	-	4.1	30.4	10.0
2/1	Bullen Rd Entry Right Left Ahead	U	C		1	11	-	196	1781	237	82.5%	-	-	-	4.2	77.3	6.9
3/1	Brading Rd Entry Left	U	D	E	1	59	33	747	1658	1105	67.6%	-	-	-	2.9	14.1	12.2
3/2	Brading Rd Entry Ahead Right	O	D		1	26	-	427	1916	542	78.8%	69	0	0	5.4	45.5	11.4
4/1	Great Preston Rd Entry Left Ahead	U	F		1	29	-	138	1845	615	22.4%	-	-	-	1.0	25.4	2.6
4/2	Great Preston Rd Entry Right	U	F		1	29	-	475	1765	588	80.7%	-	-	-	5.6	42.7	12.8

C1

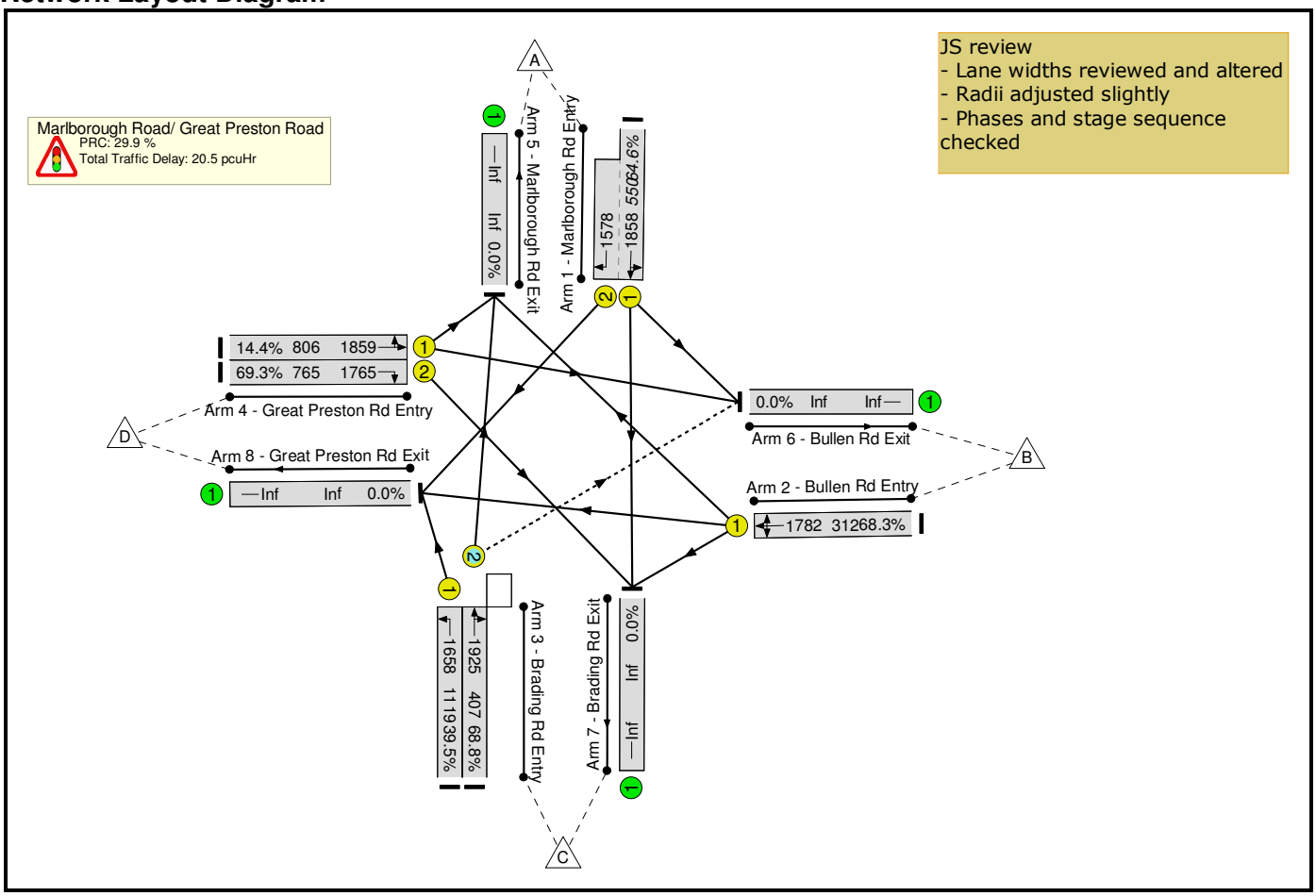
PRC for Signalled Lanes (%): 9.0 Total Delay for Signalled Lanes (pcuHr): 23.23 Cycle Time (s): 90

PRC Over All Lanes (%): 9.0 Total Delay Over All Lanes(pcuHr): 23.23

Basic Results Summary

Scenario 7: '2034 AM DS (120 secs)' (FG3: '2034: AM Peak', 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	-	-	-		-	-	-	-	-	-	**69.3%**	**35**	**0**	**0**	**20.5**	-	-
Marlborough Road/ Great Preston Road	-	-	-		-	-	-	-	-	-	**69.3%**	**35**	**0**	**0**	**20.5**	-	-
1/1+1/2	Marlborough Rd Entry Left Ahead Right	U	A B		1	33:4	-	355	1858:1578	550	64.6%	-	-	-	4.8	48.8	9.9
2/1	Bullen Rd Entry Right Left Ahead	U	C		1	20	-	213	1782	312	68.3%	-	-	-	3.8	64.2	7.7
3/1	Brading Rd Entry Left	U	D	E	1	80	55	442	1658	1119	39.5%	-	-	-	1.4	11.3	6.8
3/2	Brading Rd Entry Ahead Right	O	D		1	25	-	280	1925	407	68.8%	35	0	0	4.5	58.4	9.6
4/1	Great Preston Rd Entry Left Ahead	U	F		1	51	-	116	1859	806	14.4%	-	-	-	0.7	23.2	2.4
4/2	Great Preston Rd Entry Right	U	F		1	51	-	530	1765	765	69.3%	-	-	-	5.2	35.1	15.4

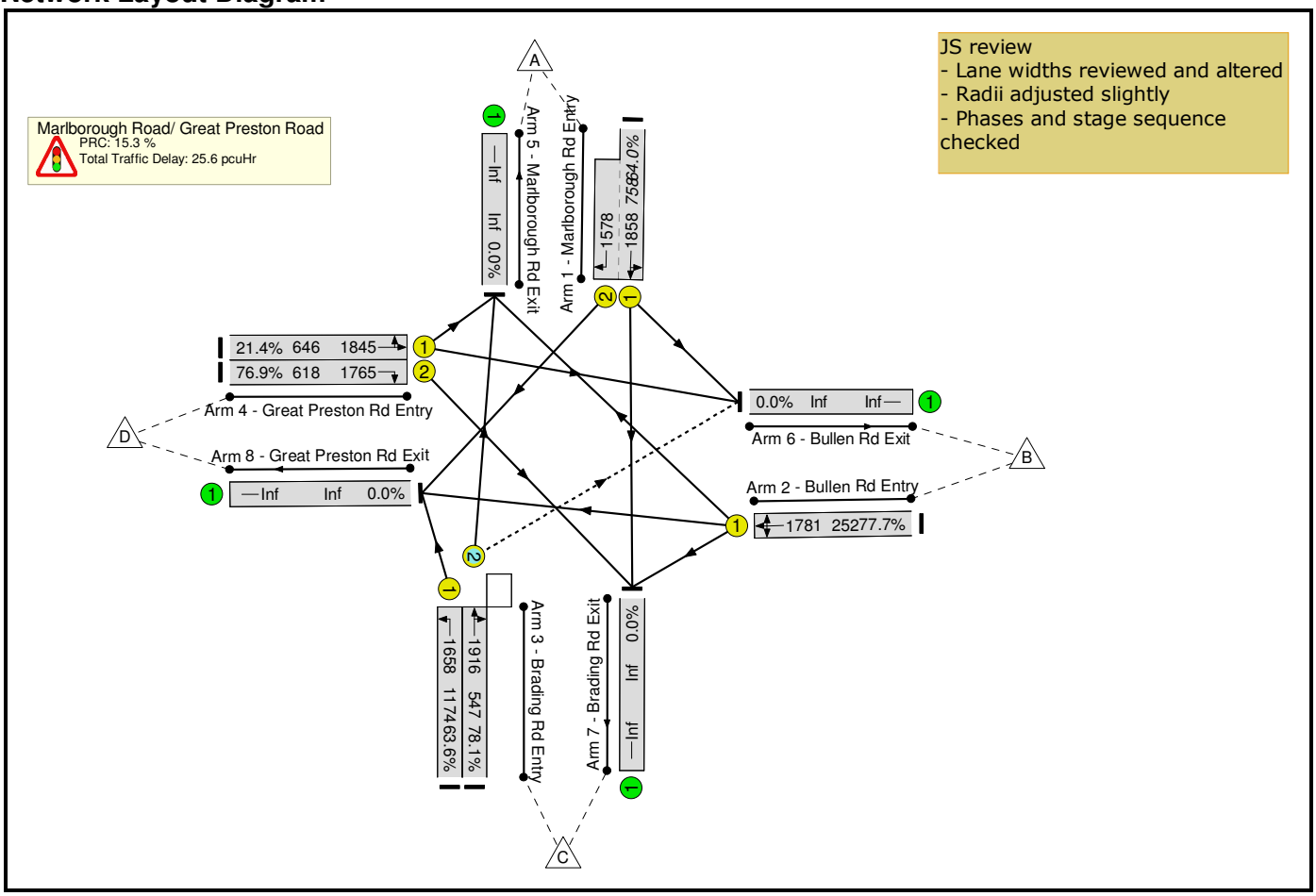
C1 PRC for Signalled Lanes (%): 29.9 Total Delay for Signalled Lanes (pcuHr): 20.46 Cycle Time (s): 120

PRC Over All Lanes (%): 29.9 Total Delay Over All Lanes(pcuHr): 20.46

Basic Results Summary

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

Network Layout Diagram



Basic Results Summary

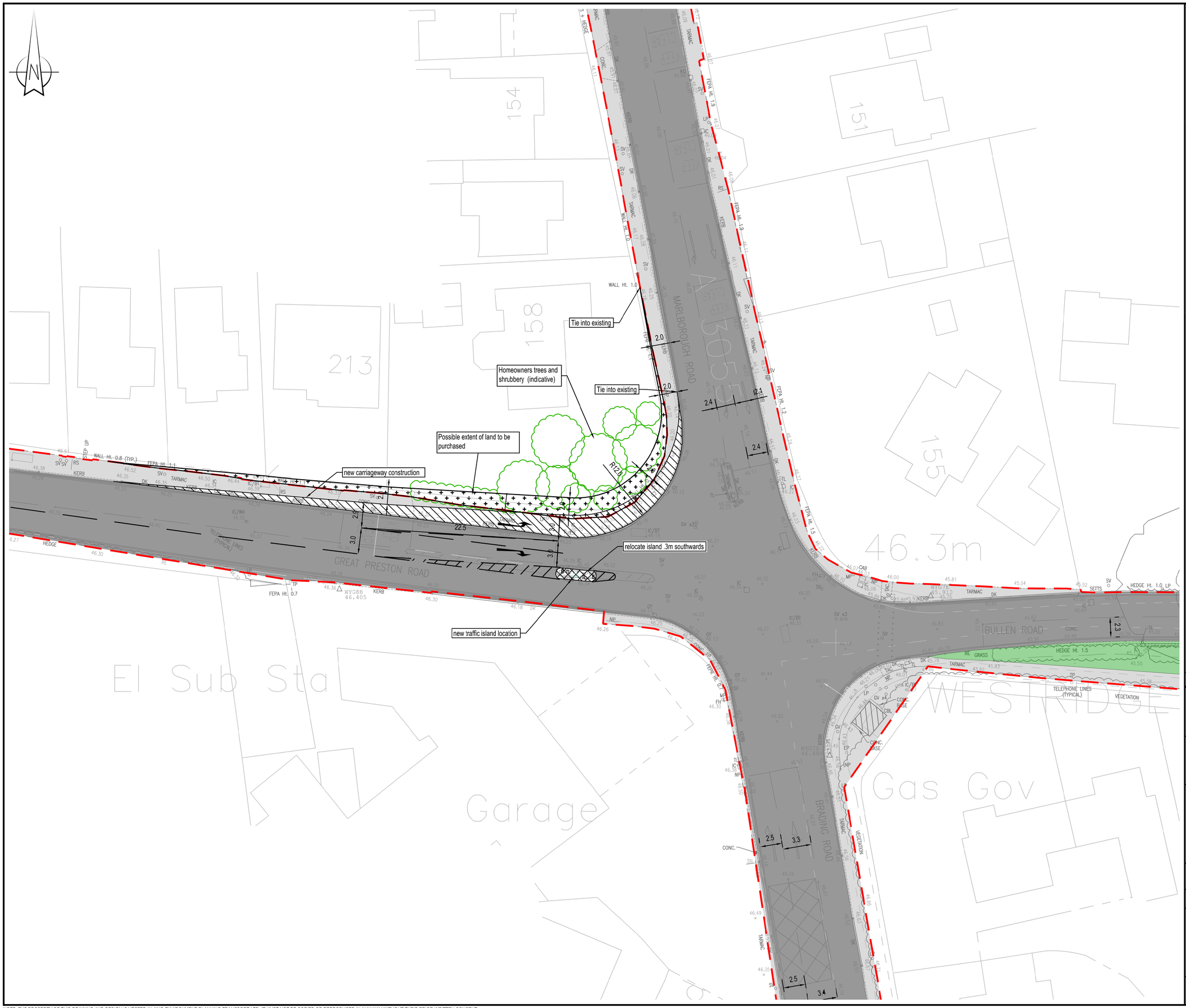
Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	**78.1%**	**69**	**0**	**0**	**25.6**	-	-
Marlborough Road/ Great Preston Road	-	-	-		-	-	-	-	-	-	**78.1%**	**69**	**0**	**0**	**25.6**	-	-
1/1+1/2	Marlborough Rd Entry Left Ahead Right	U	A B		1	47:4	-	485	1858:1578	758	64.0%	-	-	-	5.0	37.1	13.1
2/1	Bullen Rd Entry Right Left Ahead	U	C		1	16	-	196	1781	252	77.7%	-	-	-	4.3	79.9	7.9
3/1	Brading Rd Entry Left	U	D	E	1	84	45	747	1658	1174	63.6%	-	-	-	2.8	13.5	13.9
3/2	Brading Rd Entry Ahead Right	O	D		1	39	-	427	1916	547	78.1%	69	0	0	6.1	51.5	14.8
4/1	Great Preston Rd Entry Left Ahead	U	F		1	41	-	138	1845	646	21.4%	-	-	-	1.2	31.0	3.4
4/2	Great Preston Rd Entry Right	U	F		1	41	-	475	1765	618	76.9%	-	-	-	6.2	47.0	15.6

C1 PRC for Signalled Lanes (%): 15.3 Total Delay for Signalled Lanes (pcuHr): 25.65 Cycle Time (s): 120

PRC Over All Lanes (%): 15.3 Total Delay Over All Lanes(pcuHr): 25.65

Appendix B
PROPOSED JUNCTION DESIGN



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 or 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 road marking
- Proposed road marking
- Existing footway
- New carriageway construction
- New traffic island relocation and construction
- Proposed land to be purchased
- Grass verge
- Indicative shrubbery within house number 158's land

INDICATIVE

REV	DETAILS	DRAWN BY	CHECKED BY	DATE
C	Redesign of junction after comments from client	SJR	GS	08.03.2017

CLIENT: Isle of Wight Council

PROJECT: IOW

DRAWING TITLE: Junction 10 Ryde

SCALES:	SHEET SIZE:
1:200	A1

DRAWN:	CHECKED:	DATE:
SJR	NW	08.03.2018

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: A090129-99-004

REVISION: C