MOTT MACDONALD

Bridgend Replacement Local Development Plan

Technical Note Series

Project:	Bridgend Replacement LDP		
Our reference:	100415574 – TN 001	**Your reference:**	
Prepared by:	Claudia Currie	**Date:**	May 2021
Approved by:	Claudia Currie	**Checked by:**	Margaret Henderson
Subject:	Data Availability, Report of Surveys and COVID uplift for the Base Year Calibration.		

1 Introduction

Mott MacDonald was commissioned in January 2020 by Bridgend County Borough Council to develop a series of technical notes to help determine the traffic impact of committed developments and the proposed Candidate Sites on the highway network as part of evidence base supporting the Local Plan development process. These technical notes will report on the modelling tests used to determine the developing impact of traffic at key junctions on the Bridgend highway network. These key junctions will be modelled using Junctions9 and LINSIG, as appropriate. The Roundabouts and Priority Junctions will be modelled using Junctions9 software and the signal controlled junctions will be modelled using LINSIG software.

The series of junction modelling tests will be carried out using a 2020 count database from October 2020.

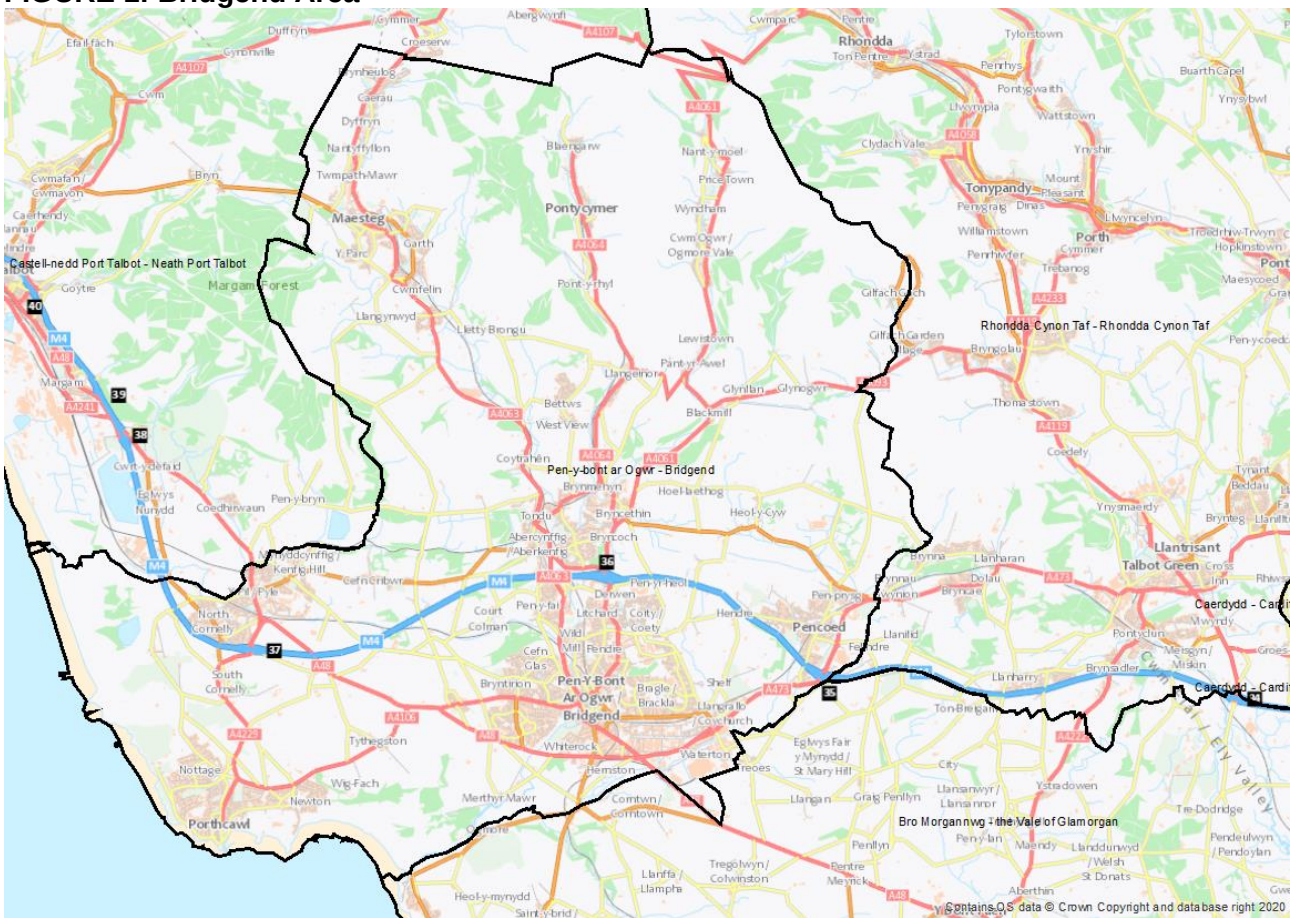
Each Technical Note will detail the work that has been completed, draw conclusions and make recommendations for further analysis and support to inform the development of the Replacement Bridgend Local Development Plan.

2 Location

Bridgend County Borough Council (BCBC), with a population of approximately 147,000, is a coastal unitary authority area in South Wales. It is bounded by the Bristol Channel to the South and three unitary authority areas; to the north and west is Neath Port Talbot, to the north and east is Rhondda Cynon Taff and to the east is The Vale of Glamorgan.

The M4 motorway, which is the responsibility of the Welsh Government as the highway authority for all Welsh trunk roads, runs through the County Borough on an east/west axis and divides the unitary authority area in two. Access to and from the motorway can be made at Junctions 35 Pencoed, 36 Sarn and 37 Pyle, as shown in Figure1.

FIGURE 1: Bridgend Area



Source: Mott MacDonald, ArcMap

3 Data Collection

Mott MacDonald completed a review of existing traffic data and determined that a comprehensive data collection programme needed to be developed to enable the assessment of all the key junctions on the Bridgend road network.

3.1 Existing Traffic Data Sources

A number of historic Transport Assessments have been used to provide traffic data for the Motorway Junctions to help inform a high level review of their operation and the impact of traffic using Junctions 35, 36 and 37 to access the local Bridgend Highway Network.

- ***M4 Junction 36 Improvements Stage 4 Report: Analysis of the Efficiency, Capacity and Congestion Issues of the Existing Junction*** (Draft - August 2015 Ref CS/069510) from Capita Consulting
- ***Junction 36 of the M4 VISSIM Modelling*** (October 2017 Ref Project CS/069510) from Redstart

- ***Junction 36 WelTAG - Stage 1 Final Report*** (October 2018 Ref CS/095423/2/P02) from Redstart.
- Junction 36 and 37 from ***Land Adjacent to A48, Pyle, Bridgend (October 2020 Ref 18-00592/TA/01)*** from Corun Associates Ltd.
- Junction 35, 36 and 37 from the **South East Wales Traffic Model output files** (Base year 2015 plus Future Years 2026 and 2036).

3.2 2020 Survey Programme

This programme of surveys was initially commissioned in March 2020. However, due to the full COVID19 lockdown in place in Wales at that time these were rescheduled for October 2020, the next available neutral month without a full lockdown covering Wales. A number of local lockdowns were in place during the October survey period, but it was agreed that a COVID uplift would be applied to the count data collected to provide a base data set that would be similar to the pre-COVID norm.

The traffic data collected included 26 junction counts and 2 automatic traffic counts. All surveys were completed on a neutral day in October 2020 before the school holiday half term break (Thursday 15th October 2020). The automatic traffic count data covered a full week which straddled the junction count days, to enable validation of the junction counts as typical days. All data was collected for the full twelve-hour period between 07:00 and 19:00 and the vehicles were classified in accordance with DMRB classifications for vehicle types:

- Pedal Cycles
- Motorcycles
- Cars/Taxis
- LGV
- OGV 1
- OGV2
- PSV

The survey company completing the data collection confirmed there were no unusual occurrences during the October survey period which would have affected the traffic flow patterns. However, there is evidence that the traffic flows were slightly lower due to the local lockdowns, where vehicle drivers were encouraged not to travel, unless it was necessary to do so for work or health related purposes, in some areas in Wales.

The two automatic traffic count locations are detailed below and their locations are show in Appendix A.

- Park Street; between Cae Dre St and Glan Y Parc (Survey Location A).
- Cowbridge Road; between The Crown and the pedestrian crossing (Survey Location B).

The junction counts surveyed are detailed in Table 1 and are also shown in Appendix A. These include a number of junctions that were counted primarily for a separate air quality assessment exercise.

The 12 hour traffic data collected is referenced in Appendix B.

Table 1: Survey Locations

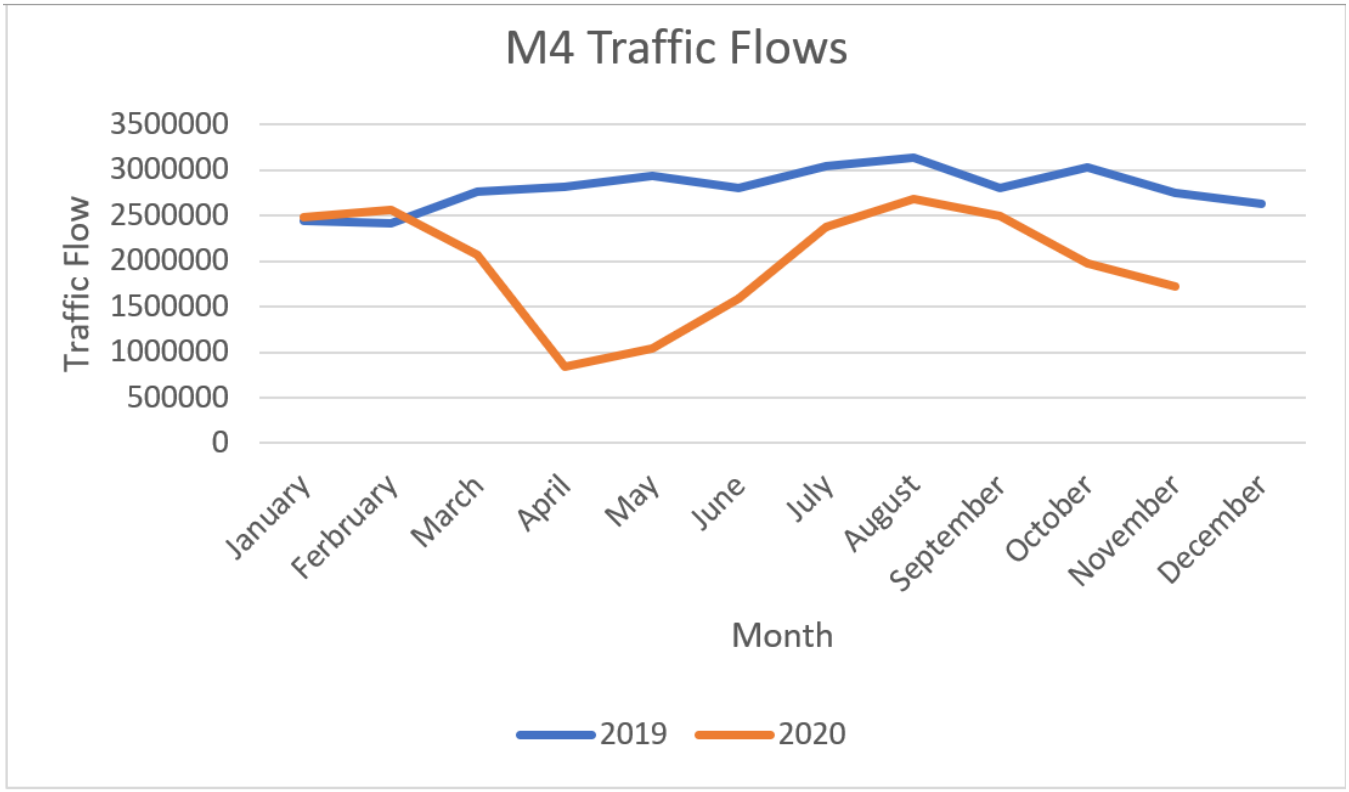
Ref No	Survey Location	Junction Type
1	A4229 Pyle Rd/A4106 Newton Nottage Rd/A4106/Fulmar Rd	Roundabout
2	A48/A4106 Bridgend Road roundabout	Roundabout
3	A48/A473 roundabout	Roundabout
4	A48 Bypass Road/ B4265 Ewenny Road roundabout	Roundabout
5	A473/A48 Roundabout	Roundabout
6	A473 Waterton Road / Brocastle Avenue/ A473 Waterton Road/ B4181 Coychurch Road	Roundabout
7	A4061/Heol Stradling/W Plas Rd roundabout	Roundabout
8	A4061 Rotary International Way/B4181 Tremains Road/Boulevard De Villenave/Coity Road	Signalised gyratory
9	A4061/A473/Tondu Road roundabout	Roundabout
10	A473 Tondu Road/Angel Street/Park Street	Signalised junction
11	A473/Glan-Y-Parc	Priority junction
12	St Leonards Road/A473	Priority junction
13	Heol-Y-Nant/A473 Park Street	Priority junction
14	A4061/McArthur Glen	Roundabout
15	A4061/Litchard Hill/Heol Y Groes	Roundabout
16	A473/B4622/Bright Hill	Priority junction
17	A483 Cowbridge Road/B4265 Ewenny Road/ A473 Langenau Strasse/Nolton Street	Priority junction
18	A48 Bypass Road/B4622	Roundabout
19	A48 Crack Hill/Brocastle Manor	Roundabout
20	A48 Crack Hill/B4524 Corntown Road	Priority junction
21	A4229/A48/Pyle Road	Roundabout
22	A4063 Maesteg Road/A4065 Bryn Road/Bridgend Road	Signalised junction
23	A4063/Park Road	Roundabout
24	A4061/Heol Canola	Priority junction
25	A4093/A4061/Heol Pant-Yr-Arwel	Priority junction
26	Penybont Road/Hendre Road/Coychurch Road/Heol-Y-Groes	Priority junction

4 Impact of COVID 19 on 2020 traffic flows

Traffic flows in Wales dropped significantly in April 2020, following the start of the full lockdown, to levels close to 30% of the 2019 levels. However, by August 2020 when there were no national lockdown restrictions in place across the UK traffic flow volumes had bounced back close to their 2019 levels.

In October 2020 the traffic flows in Wales were around 70-80% of the 2019 levels as shown in Figure 2.

FIGURE 2: M4 Traffic Flows



Source: Mott MacDonald and Traffic Wales

Data from the Department of Transport Provisional Traffic Estimates for Great Britain (October 2019 – September 2020), published on 3rd December 2020 has been reviewed to develop a robust COVID uplifting factor because the data is based on traffic data continuously collected from approximately 300 automatic traffic counters across the entire UK highway network.

This provides the following headlines for traffic comparisons for the years ending September 2019 and September 2020.

- *All motorway traffic decreased by 18.9%.*
- *Car traffic decreased by 20.9%.*
- *Van and lorry traffic decreased by 11.4% and 10.0%, respectively.*
- *Traffic decreased across all main road types. Motorways, A roads and minor roads by 24.9%, 18.7% and 15.9%, respectively.*

The COVID uplift has been calculated from this data set using *Table TRA2501a Road Traffic Vehicle miles for all motor vehicles* for Quarter 3, as this is the latest published data.

- Quarter 3 2019 355.9
- Quarter 3 2020 288.7
- **COVID Uplift factor 1.23**

Welsh Government and Department for Transport Automatic traffic count data sources were searched to see if any data was available to provide a robust October 2019 to October 2020 COVID uplift factor. No suitable sites were available for the Bridgend area. A site north of Pontypridd provided possible factors of 1.25 for the AM and 1.32 for the PM peak, but this is over 30 km away from the nearest BCBC boundary via the Strategic Trunk Road Network.

Traffic data repositories from a number of traffic data collection companies were also interrogated, but could not provide any suitable data to determine a reliable factor to be used for the COVID uplift. In addition, Transport Assessments for the LDP Candidate Sites and recent Major Planning Applications within BCBC were reviewed to see if any relevant count data had been submitted, but none was found.

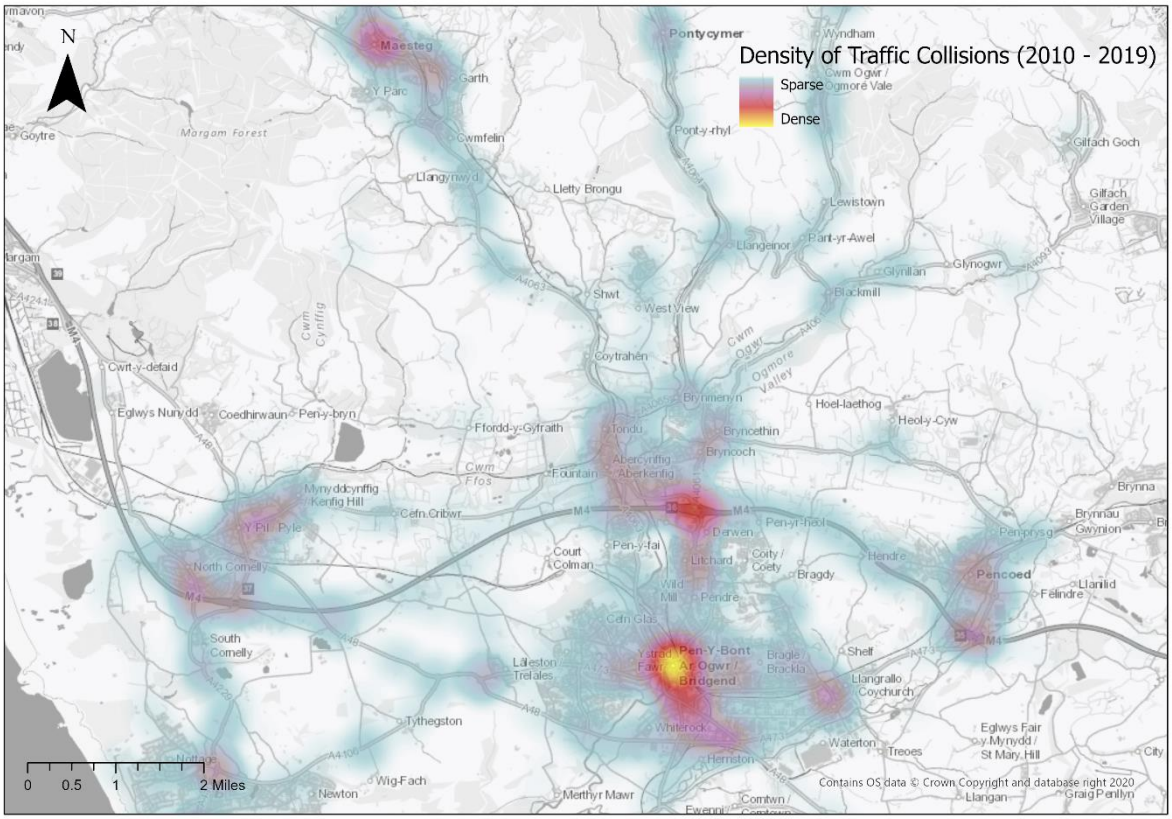
Therefore, all the traffic data collected in October 2020 has been uplifted by a factor of 1.23 to ensure the junction modelling carried out is robust as this factor is based on traffic data continuously collected from approximately 300 automatic traffic counters across the entire UK highway network.

5 Collision Data

Collision data has been extracted from the CrashMap database for the 10 year period 2010 to 2019. This database provides a summary of the STATS19 data collected and recorded by South Wales Police for all the highways in South Wales.

Figure 3 shows the heat map of collisions along the motorway and highlights the concentration of collisions at all three of the motorway Junctions, with Junction 36 having the worst collision record. It also highlights the main cluster of collisions within Bridgend town centre and the other collision clusters which are concentrated in the main residential areas, such as Pencoed and Maesteg.

Figure 3: Collison Heat Map 2010-2019



Source: Mott MacDonald; CrashMap; ArcMap

6 Technical Note Development

A series of technical notes will be developed in order to help inform the development of the Replacement Bridgend Local Development Plan, these will follow the following work package (WP) structure as detailed in the initial project brief.

- **Technical Note 1** covers data availability, the survey requirements, the data collection information and the calculation of the COVID Uplift for the Base Year model calibration.
- **Technical Note 2** will cover the proposed improvements to the Motorway Junctions (35, 36, 37 and 34a).
- **Technical Note 3** will cover **WP1** It will identify the base position and determine if the existing strategic transport network does operate effectively at present (2019-2020). It will identify deficiencies in the highway network, public transport service provision and associated infrastructure, frequency and capacity of rail services and availability of active travel provision. Specific locations, particularly key junctions where the transport network is overcapacity will also be identified.

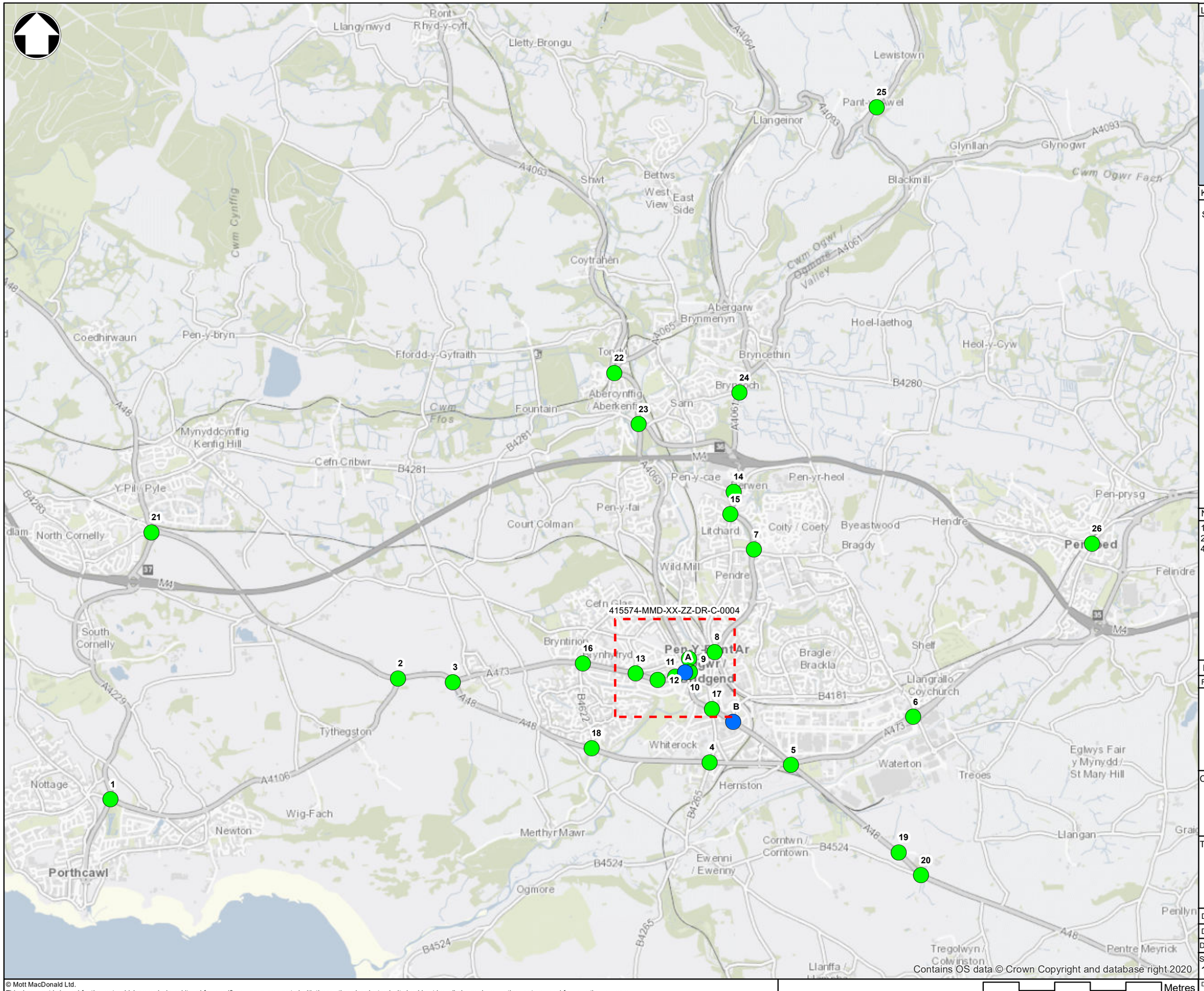
- **Technical Note 4** will cover **WP2** and assess the likely impact of the traffic generated as a result of developments under construction on the existing strategic transport network, taking account of the build out position of these developments. It will also cover **WP3** and will assess the likely impact of the traffic generated on existing strategic transport network as a result of committed development yet to commence construction and the LDP candidate sites, the Sustainable Growth Areas and the Regeneration Growth Areas. This assessment will identify the likely main areas of impact on the network.
- **Technical Note 5** will continue the development of **WP3** and review the potential assessment of the impact that seasonal variation has on the A48, A4106, and A4229 corridors that serve Porthcawl. It is anticipated that the development proposals aimed at regenerating Porthcawl will exacerbate the traffic congestion these corridors experience during the summer months.
- **Technical Note 6** will cover **WP4** and will undertake a review of neighbouring local authority development proposals and assess the likely impact on the strategic transport network within BCBC.
- **Technical Note 7** will cover **WP5** and develop a range of possible solutions to facilitate all proposed development so that the transport network in BCBC is no worse than the base position (2019-2020) - the nil detriment scenario. The solutions will aim to enhance sustainable connectivity throughout the strategic transport network and to achieve modal shift away from the private car and towards public transport and active travel. Such proposals may include measures to increase park and ride capacity, provision of new public transport options, improved signposting to enable smarter travel choices, bus priority measures, development of the active travel network, improvement of the existing highways and the provision of enhanced junction capacity. These need not necessarily be limited to physical alterations to the transport network, but could include other measures such as improved enforcement of parking contraventions.
- **Technical Note 8** will cover **WP6** and will undertake the development of a series of scenarios to test the level of proposed development that can be accommodated by the existing strategic transport network before improvements are required to bring their operation back to the base year position. This will also determine whether the provision of additional, or improved public transport services, or active travel improvements will be able to support the accommodation of the additional journeys generated by these additional proposed developments.
- **Technical Note 9** will cover **WP7** and identify possible options for developer contributions and a mechanism for assessing a charging regime to enable the apportionment of costs for any required highway improvements to the responsible development.

7 Conclusion

Technical Note 1 has summarised the available traffic data for the Bridgend County Borough Council area and identified the gaps in available data. This technical note has also identified the need for a comprehensive survey programme, which was completed in October 2020 and has established a robust factor to uplift these flows which were surveyed during a period of 2020 when various local lockdowns were in place as a result of the COVID19 pandemic.

Technical Note 1 also provides the details of the series of technical notes that will be completed to help enhance the evidence base in support of the BCBC Local Development Plan.

A. Appendix A – Survey Location Plan



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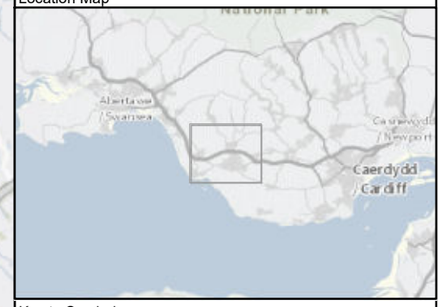
Location Map



Key to Symbols

Survey locations

- ATC
- JTC

Notes

1. For information only.
2. To be read in conjunction with: 415574-MMD-XX-ZZ-DR-C-0004

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	25/01/21	JW	For information	MH	CC

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Designed	J Wu	JW	Eng. Check	M Henderson	MH
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Dwg Check	J Keane	JK	Approved	C Currie	CC

Scale at A3	Status	Rev	Security
1:50,000	INF	P1	STD

Drawing Number: 415574-MMD-XX-ZZ-DR-C-0003

Metres: 0 500 1,000 1,500 2,000 2,500

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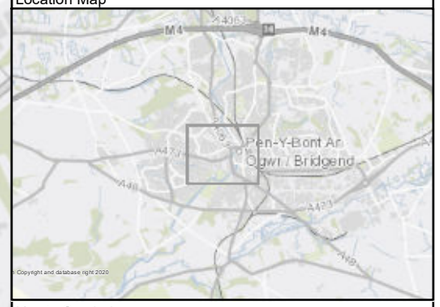
Location Map



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Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	25/01/21	JW	For information	MH	CC

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Scale at A3	Status	Rev	Security
1:5,000	INF	P1	STD

Drawing Number: 415574-MMD-XX-ZZ-DR-C-0004

Metres: 0 50 100 150 200 250

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B. Appendix B – Survey Data

TRACSIS junction data for Thursday 15th October 2020 was supplied in excel format

4739-LON Bridgend TC's Site A1-A8

4739-LON Bridgend TC's Site B9-B13

4739-LON Bridgend TC's Site A14-A20

4739-LON Bridgend TC's Site A21-A26

Bridgend Replacement Local Development Plan

Technical Note Series

Project:	Bridgend Replacement LDP		
Our reference:	100415574 – TN 002	**Your reference:**	
Prepared by:	Claudia Currie	**Date:**	May 2021
Approved by:	Claudia Currie	**Checked by:**	Margaret Henderson
Subject:	Strategic Trunk Road Junctions.		

1 Introduction

Mott MacDonald were commission in January 2020 by Bridgend County Borough Council (BCBC) to develop a series of technical notes to help inform the supporting evidence for the Replacement Local Development Plan.

Each technical note details the work that has been completed, draws conclusions and makes recommendations for further analysis in order to inform the development of the Replacement Bridgend Local Development Plan.

2 Current Position

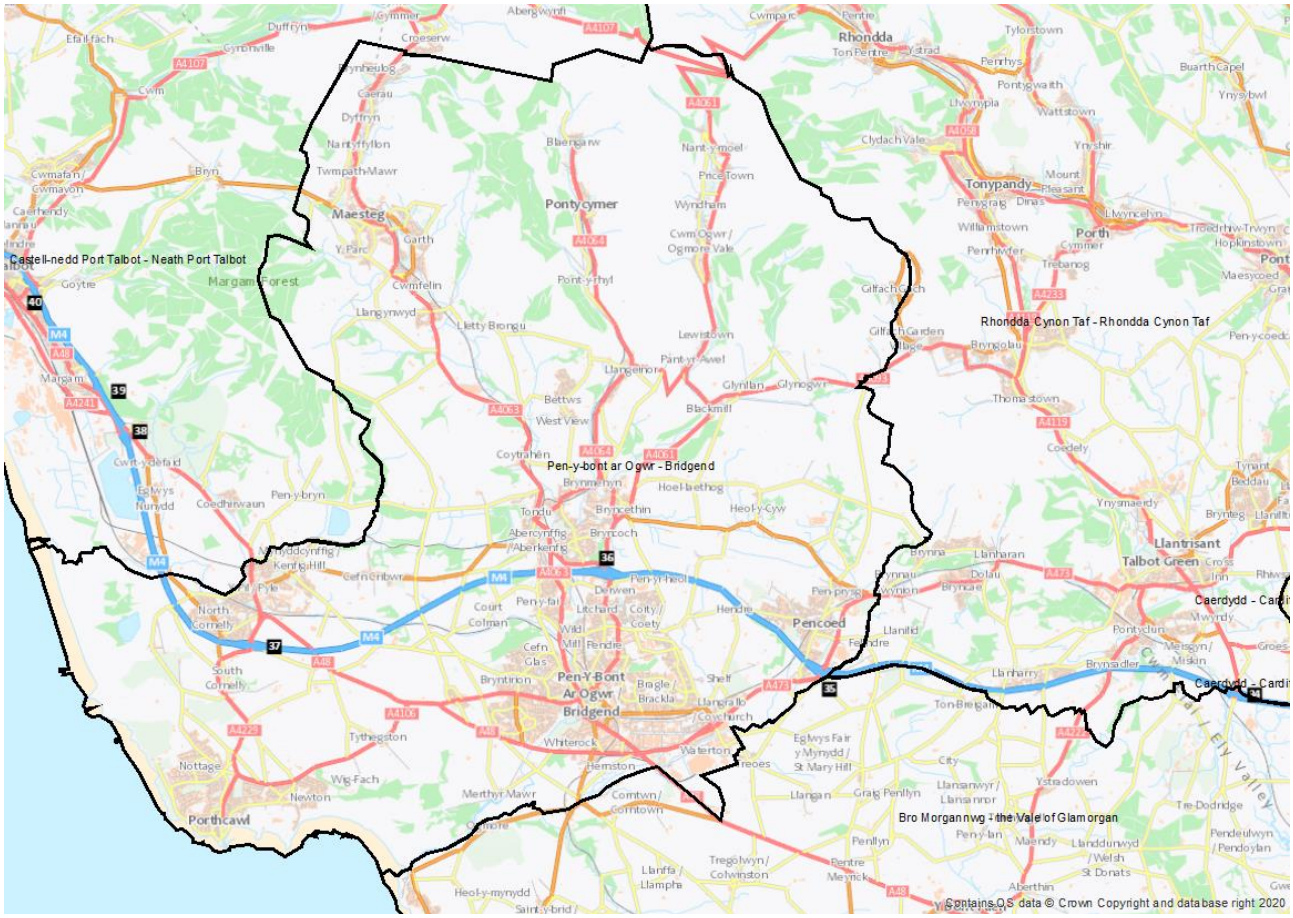
The Welsh Government (WG) is the highway authority that is responsible for the motorway and trunk roads in Wales. The M4 motorway is a three lane highway that runs east and westbound across the middle of the BCBC unitary authority area.

The M4 motorway can currently be used to access areas within the BCBC area at three locations as shown in Figure 1. These three accesses are at:-

- Pencoed (Junction 35) which is partially signal controlled roundabout,
- Sarn (Junction 36) which is a signal controlled dumbbell gyratory, and
- Pyle (Junction 37) which is a roundabout.

The Welsh Government has commissioned a number of WelTAG studies into the operation of the M4 in South Wales in order to address a number of long-term reported issues, including air quality, road safety and congestion.

FIGURE 1: Bridgend Area



Source: Mott MacDonald; ArcMap

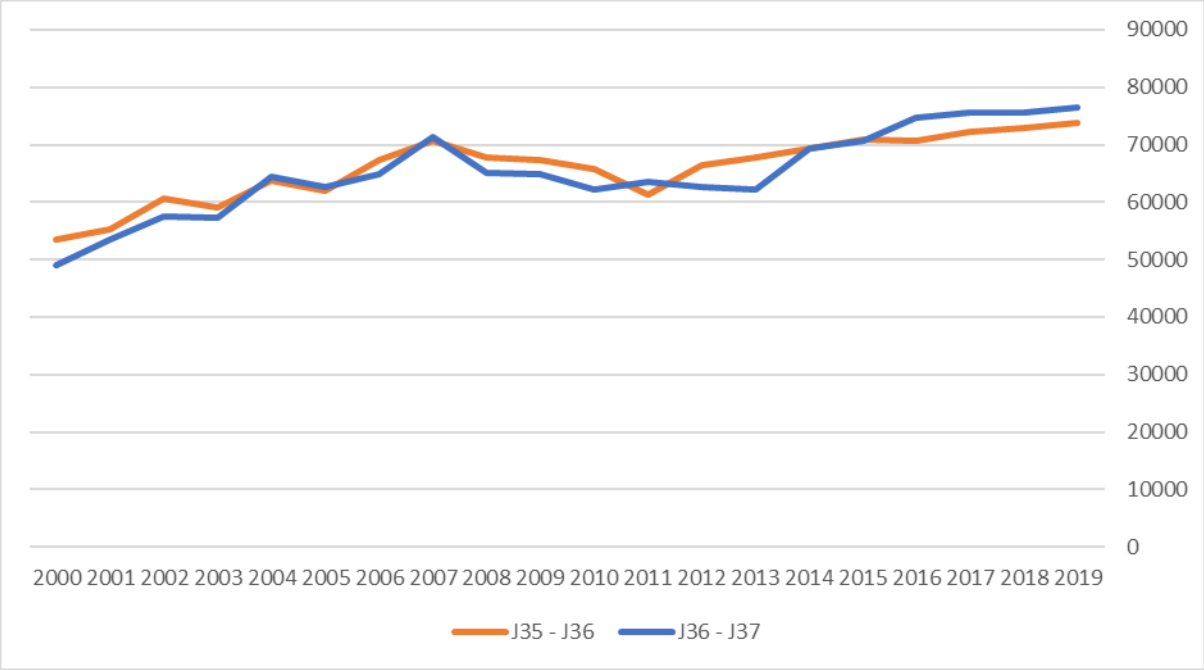
3 M4 Junction 35 to Junction 36 Baseline

Traffic Flows

Traffic data from the Department of Transport Site 50505 situated between Junctions 35 and 36 and site 20502 between Junctions 36 and 37 show that the Annual Average Daily Traffic flow (AADT) was approximately 75,000 to 77,000 vehicles per day in 2019. Figure 2, overleaf, shows that there has a fairly steady increase in traffic volumes on both sections of the M4 with an increase of approximately 56% increase over the last 20 years.

Table 1, overleaf, shows the percentage of Heavy Good Vehicle (HGV) within the AADT from sites 50505 and 20502 has steadily declined from 11% in the year 2000 to 7% in 2019.

Figure 2:Historic AADT flows



Source: Mott MacDonald and DfT sites 50505 and 20502

Table 1 Traffic Flow and HGV Data between Junction 35/36 and 36/37

	Traffic Flow and HGV Data between Junction 35/36		Traffic Flow and HGV Data between Junction 36/37	
Year	AADT	HGV (%)	AADT	HGV (%)
2019	73815	8	76556	7
2018	72846	8	75643	7
2017	72285	8	75688	7
2016	70578	8	74635	7
2015	70792	8	70652	8
2014	69251	7	69388	7
2013	67815	8	62194	8
2012	66486	8	62613	8
2011	61247	8	63561	7
2010	65720	9	62182	9
2009	67301	8	64790	8
2008	67790	9	65070	8
2007	70748	9	71411	9
2006	67396	9	64939	9
2005	61962	9	62582	9

2004	63808	10	64521	9
2003	59087	7	57289	9
2002	60538	10	57605	9
2001	55178	11	53446	9
2000	53568	11	49113	11

Source: Mott MacDonald and DfT sites 50505/20502

Collison History

Collision data has been extracted from the CrashMap database for the 10 year period 2010 to 2019, the latest available published data (next scheduled publication updated is September 2021). This database provides a summary of the STATS19 data collected and recorded by South Wales Police for all the highways in South Wales.

Table 2 highlights the number of collisions at each of the Bridgend M4 junctions and highlights that the greatest concentration of collisions is at Junction 36.

Table 2 Total Junction Collison Numbers by Severity (2010-2019)

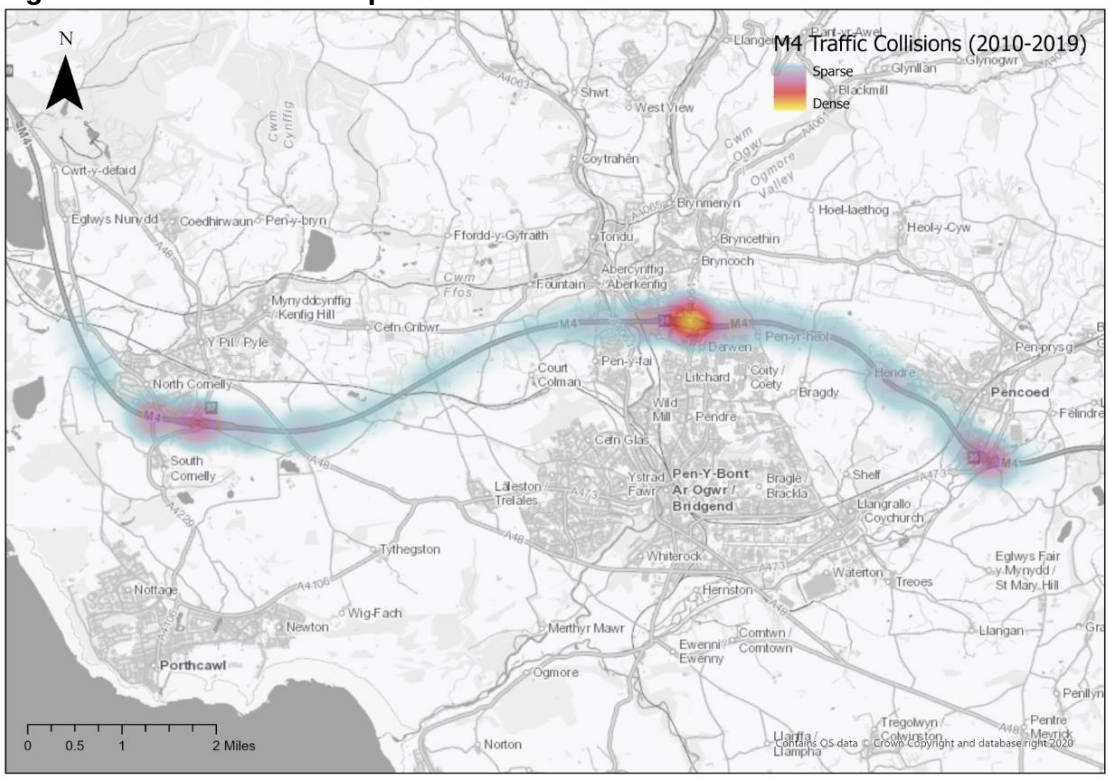
Junction Number	Collison Severity	Number
Junction 35	Fatal	0
	Serious	3
	Slight	22
Junction 36	Fatal	0
	Serious	4
	Slight	46
Junction 37	Fatal	0
	Serious	5
	Slight	22

Source:Mott Mac Donald and CrashMap

Figure 3, overleaf, shows the heat map of collisions along the motorway and highlights the concentration of collisions at all three of the Motorway Junctions, with Junction 36 having the worst collision record.

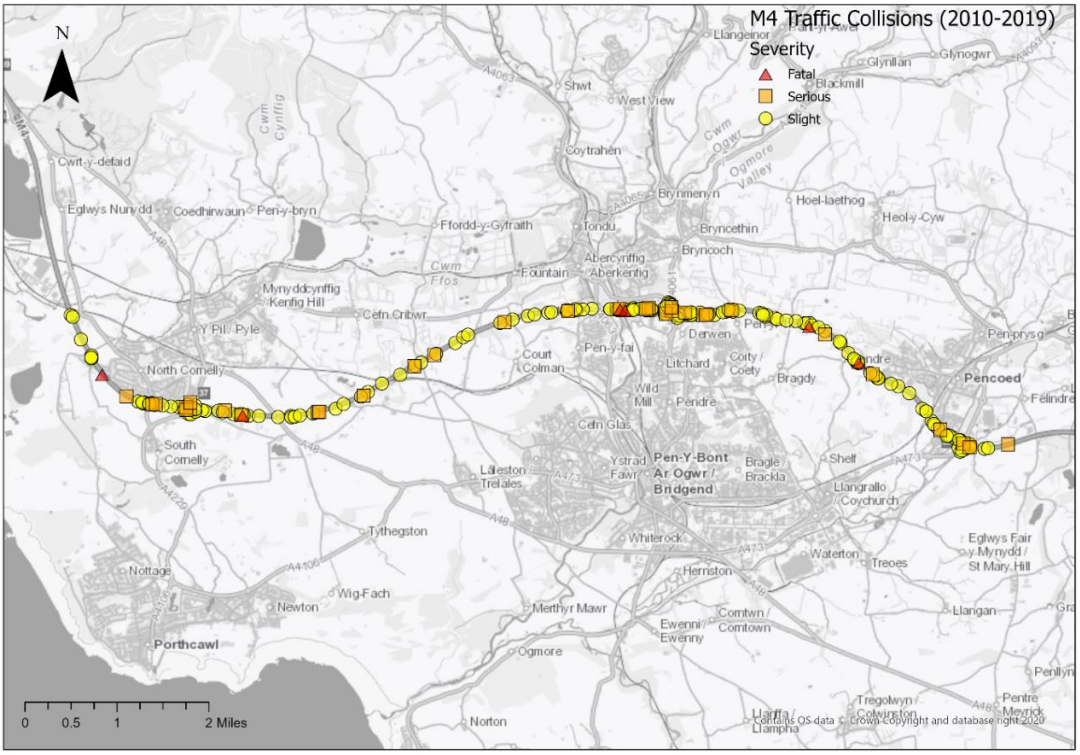
On the mainline of the M4 between Junctions 35 and 37, including the interchanges themselves, there have been 256 collisions in the last 10 years of which 6 have been fatal (2%), but the majority (85%) have been classified as slight and the remaining 13% have been classified as serious. An analysis by month shows that the majority of the collisions occur in the winter months from December to February. Figure 4, overleaf, shows the location of all 256 collisions.

Figure 3: Collison Heat Map 2010-2019



Source: Mott MacDonald and CrashMap

Figure 4: Collison Severity Location Records 2010-2019



Source: Mott MacDonald and CrashMap

4 WelTAG Stage 1 and Stage 2

The Welsh Government has commissioned a number of WelTAG studies of the M4 between Junctions 35 Pencoed and Junction 49 Pont Abraham.

WelTAG Stage 1 M4 J35 to J49 Pont Abraham – published by Arcadis in July 2019

The report highlights that flows will increase between Junction 35 and 36 and that the section of the M4 between Junctions 36 and 37 has a particularly poor collision record. This has also been demonstrated from the collision data presented in Section 3 above.

The interventions identified for the Bridgend area to be taken forward to WelTAG Stage 2 are:-

- **ERS1** Junction 36-38 Improvements Package*. This should be investigated further as a separate study but focuses on traffic speeds and accidents*. The reports identifies this as *short to medium term. A package of measures will be identified to address high vehicle speeds*.
- **ESR4** Junction Improvements for Junctions 36, 48 and 49. The report identifies this as *short to medium term efficiency enhancements*

A number of complementary options have also been identified in the report which would provide an alternative to travel using the M4.

- **ALT1** Consideration of rapid transit from Porthcawl to Bridgend Junction 36-38 Improvements Package. *This should be investigated further as a separate study but focuses on traffic speeds and accidents. The report identifies this as a long term proposal for the strategic bus corridor.*

WelTAG Stage 2 M4 J35 to J38 – to be published by AECOM April 2021

The Welsh Government, through their Trunk Road Agent SWTRA, commissioned Aecom in 2020 to carry out the WelTAG Stage 2 study for the sub area of the M4 between J35 and J38. This study is due to report in mid 2021.

It has been confirmed that currently there are no proposed highway improvements being investigated for junctions 35 and 37.

Highway improvements are still being considered at Junction 36, but no design options have been developed that would enable further uncommitted developments to be located close to this junction.

WG do not currently have any detailed highway improvement proposals for Junction 36 that are in the public domain.

5 Review of Previous Assessments of Junctions 36

A number of historic reports commissioned by BCBC for the M4 J36 have been reviewed which all conclude that the current operation of the dumbbell roundabouts do not operate well and that on occasion queues are observed on the approach roads from the BCBC highway network. A summary of their conclusions is given below.

The ***M4 Junction 36 Improvements Stage 4 Report: Analysis of the Efficiency, Capacity and Congestion Issues of the Existing Junction DRAFT*** published in August 2015 by Capita Property was commissioned by BCBC to assess the capacity and operation of the existing junction layout at M4 Junction 36. Since that time no significant highway changes have occurred and as detailed above the junction is still under investigation by WG as part of their 2021 WelTAG Stage 2 study.

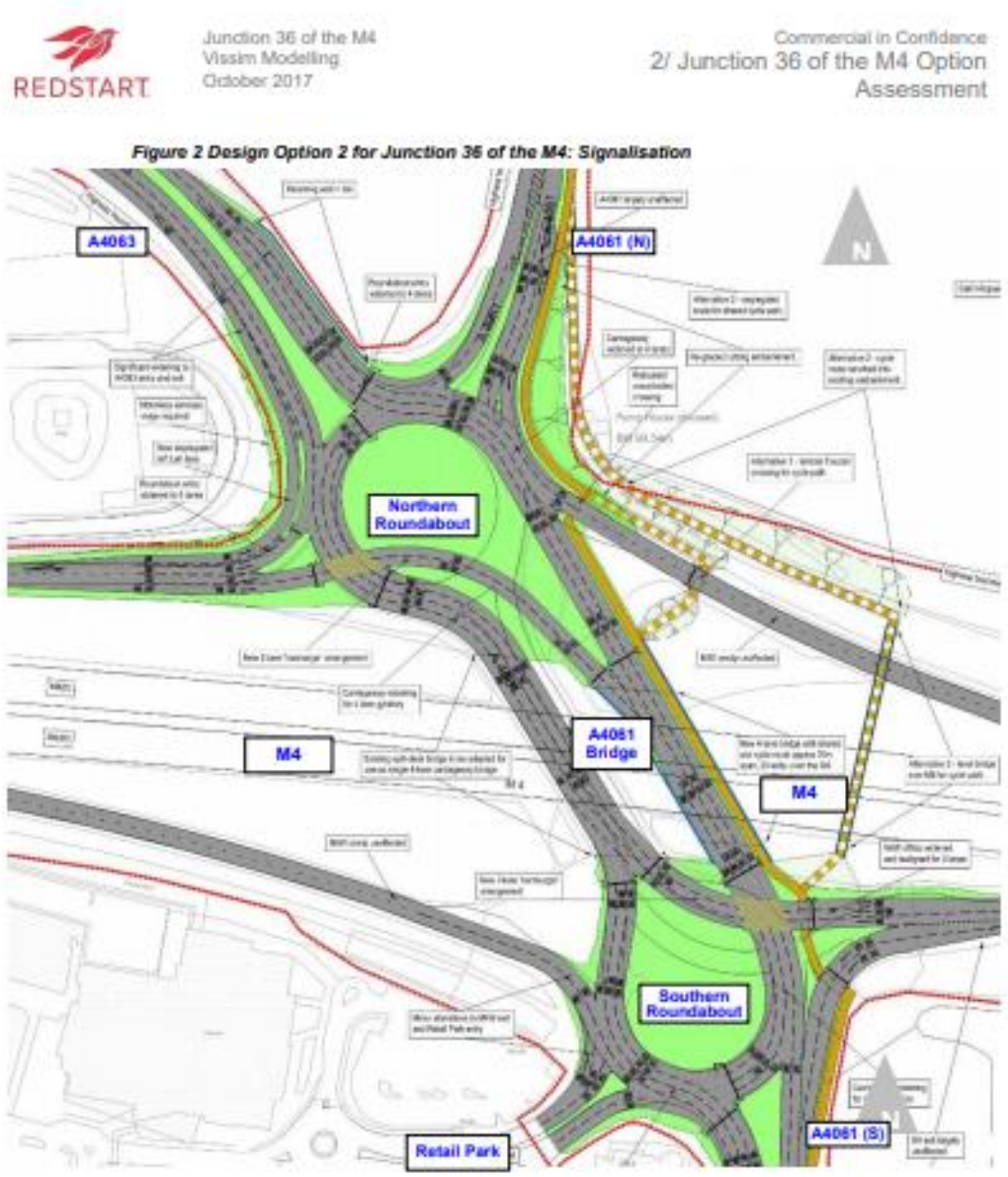
The 2015 study, which built on the October ***2014 M4 Junction 36 Improvements Existing Layout Assessment,*** noted that weekday and weekend congestion occurred on occasion, which inevitably impacts on journey time reliability particularly for bus services. It also identified that the current, unchanged, layout does not provide priority or adequate facilities for pedestrians and cyclists. However, the collision data for a 5 year period (January 2010 to September 2014) identified very few incidents involving vulnerable road users, but this may be due to active travel users being deterred from the area.

The M4 J36 northern and southern roundabouts are controlled by traffic signals under Microprocessor Optimisation Vehicle Actuation (MOVA). The two roundabouts operate independently to each other with links between to provide co-ordination as and when required. The nearby Pen Y Cae Roundabout operates as a standard priority controlled roundabout. In 2015 faults were identified in both M4 signal controllers linked to a number of the detection loops. The signals are set to ensure that priority is given to the westbound M4 off slip, but on occasions the volume of traffic circulating around the northern and southern roundabouts does impact on the movement of traffic from some of the approach arms from the BCBC highway network. The eastbound offslip is unsignalised and delays can be long in the PM peak. The Sarn Park services acts as an informal release valve for traffic bound for Bridgend/McArthur Glen, as it is quicker to take a detour and arrive at the junction via the signalised A4063 northern arm. The annual average collision rate for the M4 J36 roundabouts is lower than would be expected for an interchange layout of this type.

The report concluded that “Overall delays to vehicles at the northern and southern roundabouts were observed to be short due in no small part to the very efficient operation of the traffic signals. However, when traffic volume increases, particularly during the peak periods, queues do form at certain locations which cannot be contained within the short lengths of carriageway before the previous stop or give way line and do impact upon other areas of the junction and all forms of traffic including buses.” It also highlighted additional problems with vehicles parking on the A4061 Bryncethin approach to the northern roundabout blocking the footway for pedestrians and people walking in the verges due to lack of pedestrian infrastructure.

A report published by Redstart in October 2017***Junction 36 of the M4 VISSIM Modelling*** undertook a series of investigations into the existing operation of the junction to assess if any potential highway improvements would improve the network capacity and journey times. From the options tested a revised signal controlled junction was proposed with additional carriageway realignment as shown in Figure 5 below. The report predicted that the expected 2030 flows through the junction could be accommodated with the proposed improvement. However, this configuration has not yet been finalised or secured a source of funding.

Figure 5: Redstart Proposed M4 J36 signal controlled improvement.



Source: Redstart J*unction 36 of the M4 VISSIM Modelling(October 2017)*

A further WelTAG Stage 1 report has also been published by Redstart in October 2018 ***Junction 36 WelTAG - Stage 1 Final Report*** which concludes that the M4 J36 currently still experiences significant queuing of traffic on all approaches to the junction at peak periods, leading to delays to buses and general traffic. It also confirms that the current layout does not encourage safe Active Travel journeys and that “congestion at the junction is starting to constrain the ability to meet existing development commitments and will into the future pose a barrier to proposed development opportunities surrounding the junction being taken forward. There is also a wider economic impact

with congestion at the junction hampering the regeneration and access for the communities of the Ogmore, Llynfi and Garw valleys which are all served by Junction 36."

The Stage 1 WelTAG has appraised a long list of options and has concluded that a major intervention is needed at Junction 36 and that this needs to be progressed though the WelTAG Stage 2 process to determine which of the following short listed solutions will be identified as the preferred option, together with a Do Minimum (F17) option for baseline assessment against the recommended options below.

- F01 Dedicated slip / relief lanes – A possible short term measure that may provide some capacity benefit in some locations if only for a limited time period.
- F09 Larger roundabout – This option may allow the future capacity required. However, it would require use of development or common land. It may not be possible to split north-south or east-west traffic as part of the design and is likely to be an expensive measure.
- F14 Signalised two-bridge hamburger – This option is confined within the existing development boundary of the junction and works for the next 10 years of growth. This option could be implemented as a first phase to option F09 if designed and constructed in the relevant manner.
- F11 Improvements to Heol Spencer – Although this option would need to be considered in conjunction with undertaking either F01, F09 or F14 as a package.

Any of these options should be supplemented in a package with a combination of the following elements in order to provide the optimum solution for addressing all problems identified at Junction 36.

- F12 Active Travel measures – Any Active Travel measures undertaken at Junction 36 should be safe focusing on pedestrian and cyclist safety.
- F02 – Measures to reduce the need to travel through the junction, including implementing travel plans, encouraging flexible working, investigating the use of Smart technology to manage network flow and consideration to the possible siting of a Park & Ride north of Junction 36;
- F04 – Elements of this option should be included in any final option so that consideration is given to provision of improved passenger transport (however, provision of dedicated lanes north / south is seen as less favourable).

It could be possible to apply a phased approach to implementation of options, for example, if Option F14 was taken forward and if designed/constructed with future expansion in mind, then option F09 could be constructed to provide future capacity (likely to be needed in the next 10 years). With option F09 being more expensive to implement, F14 could provide the first stage to improvement.

6 Major Developments impacting the M4 junctions

No candidate site has currently identified a capacity concern at Junction 35 or Junction 37 and no candidate site has been required to assess Junction 36 due to the industry accepted 5% threshold impact not having being met.

However, there is a significant development within the Rhondda Cynon Taff County Borough Council (RCTCBC) area, known as Llanilid, that has been considered for many years. As part of this development it was proposed in the late 1990's that a new M4 motorway junction (34a) would be constructed between Junction 34 and Junction 35. WG have previously given approval in principle to a junction design at this location. However, the current promotors of the RCTCBC site are not considering the construction of a new M4 junction as they are proposing to co-locate residential and employment areas such that the need to travel will be contained within the development area. In addition, the promoters consultants are investigating options where active travel modes will have enhanced facilities, financed through developer contributions. This will support modal shift away from motorised vehicle movements to/from the development and away from the M4.

There are currently no recent detailed development proposals in the public domain for the full RCTCBC development at Llanilid. However, RCTCBC have provide an update in April 2021:-

There is a current extant outline consent (Planning Application 10/0845) for up to 1850 new houses, together with a new primary school and village centre at Llanilid (this includes land to the north and the south of the A473). Reserved matters for Phase 1 of this development proposal have were approved for 216 houses in April 2019, and construction is currently underway.

Reserved matters for additional parcels within this site have also been submitted and are yet to be determined for the following phased developments:

- Phase 2 - 19/1081
- Phases 3 and 4 – 19/1082
- Phases 5/6/7/8 – 19/1200
- New primary school – 19/1258
- Village centre – 19/1299

Evidence from other sites within RCT, and across South Wales, suggests an annual delivery of between 100 and 150 units per year is possible. At Llanilid there are currently two constructors sharing development of the site and it is reasonable to assume it could be nearer the 150 buildout rate. Therefore in the order of 2,000 (+/- 300) units could be completed by 2033 at Llanilid and Llanharan. However, if these developers are also committed to sites elsewhere in north Cardiff and Bridgend this would influence the potential build rates and a figure of nearer 100 units per year may be more realistic for Llanilid and Llanharan, which would mean the overall figure could reduce towards 1000 within the plan period.

Given the developers' aspirations for the Llanilid and Llanharen sites, it is anticipated that the direct impact on the BCBC highway network of this generated development traffic could be limited to a certain extent. Especially, as WG has also recently published their 'New Path:Transport Strategy for 2021:Llwybr Newydd' which supports their 2020 published target of achieving 30% remote working, which could include an element of home working. This impact will be subject to continual monitoring via future transport assessments as the wider Llanilid land parcels are brought forward through the planning system.

7 Conclusion

Technical Note 2 has summarised the available traffic data, highway proposals and development opportunities impacting on the M4 between Junctions 34, 35, 36,37 and 38.

8 Recommendation

Due to the lack of clarity over what, if any, future highway improvements are proposed at Junction 36 by WG it is recommended that no further expansion of development is proposed close to this M4 motorway junction during the proposed BCBC LDP plan period.

In addition, it is recommended that a statement of common ground is entered into between WG and BCBC to ensure a jointly agreed position can be reached on the likely highway intervention level, and the phasing of any improvments, at Junction 36 as it is a key gateway junction giving access to and through BCBC.

It should be noted that any proposed highway improvement would need to follow due process and that due to the required statutory processes that would need to be carried out it will be necessary in this statement of common ground to establish the earliest timescale that any highway intervention could be completed and be fully open to traffic. The timescales for the delivery of this intervention will be dependent on the size of the proposed highway improvement which is unlikely to be in the public domain prior to the conclusion of the examination in public for the Bridgend County Borough Council Local Development Plan.

An example of a Statement of Common Ground is included in Appendix A

A Statement of Common Ground Example

Wrexham Local Development Plan 2013 - 2028 EXAMINATION

SoCG004

housing	open space	employment	community	transport	education

Statement of Common Ground:

Between Wrexham County Borough Council
and
Welsh Government for
A483 Junctions 3-6

Matter 6: Housing Allocations

This leaflet is available in accessible formats

Wrexham Local Development Plan 2013-2028 Examination in Public

Statement of Common Ground SOCG004: between Wrexham County Borough Council and the Minister for Economy and Transport

19th August 2019

1.0 Introduction

1.1 This is a joint statement produced by Welsh Government and Wrexham County Borough Council to address deliverability of the Local Development Plan (LDP) allocations with respect to impact on the A483 Trunk Road Junctions 3 to 6. The Welsh Government is responsible for trunk roads in Wales.

1.2 The Council is legally required to prepare a LDP under the Planning and Compulsory Purchase Act 2004, Part 6. The LDP must be determined 'sound' by the examination Inspector in order to be adopted (section 64 of the 2004 Act). One of the tests of soundness is 'will the plan deliver?'[1] The Council must be able to demonstrate that the LDP is deliverable with no significant impediment to its implementation. This includes demonstrating that highways infrastructure provision is, or can be, in place to deliver the planned levels of growth within the LDP period.

1.3 Welsh Government is committed to delivering an integrated transport system in North Wales that connects people, communities and businesses to jobs, facilities and services and maximises economic opportunities of connectivity. Welsh Government and Wrexham County Borough Council are concerned by the current and future predicted levels of road based congestion at points on the A483/A5 corridor and its impact on the local environment..

1.4 The Welsh Government is developing a scheme for improvements to the A483 Junctions 3 to 6 to address these concerns and that will also support the economic growth aspirations for Wrexham and the wider North Wales and cross-border region[2].

1.5 Specifically the full release of Key Strategic Site 1 (Lower Berse Farm) and the Western Gateway Employment site (protected by policy EM1, site 9) require additional capacity at junction 4 of the A483[3]. See section 3 below.

1.7 The purpose of this paper is to establish common ground between the two key stakeholders WCBC and Welsh Government, who ultimately will be responsible for addressing the existing and forecast highway capacity issues on the strategic road network.

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[1] Local Development Plan Manual Edition 2 August 2015 paragraph 8.2.1.2 https://gweddill.gov.wales/docs/desh/publications/151007local-development-plan-manual-edition-2-en.pdf

[2] North Wales Economic Ambition Board: A Growth Deal for North Wales. Page 19 https://northwaleseab.co.uk/sites/nweab/files/documents/growth_plan_doc_5_final.8.feb_.2018english.cleaned.pdf

[3] Infrastructure Delivery Plan EBI01 https://wrexham-consult.objective.co.uk/portal/ldp_ebsd

2.0 Background

2.1 The A483/A5 forms part of the trunk road network in Wales, managed by the North and Mid Wales Trunk Road Agent (NMWTRA) on behalf of Welsh Government. The A483/A5 provides one of the connecting routes between North and South Wales, as well as providing access into North Wales from the Midlands. It also has an important role for trips within England, connecting Hereford/Shrewsbury to Chester. The A483/A5 corridor between Chirk and Rossett is shown in Figure 1 and the junctions from the A483 into Wrexham are in Figure 2.

2.2 Welsh Government and Wrexham CBC recognise the potential impact of congestion on the A483/A5 corridor on growth aspirations for Wrexham and the wider North Wales and cross-border region.

2.3 A483 Wrexham Bypass – Junction 3 to 6 is a pinch point scheme included in the Welsh Government's National Transport Finance Plan and the Moving North Wales Forward document.

2.4 The National Transport Finance Plan (NTFP) was published in July 2015. It sets out in more detail how Welsh Government propose to deliver the outcomes set out in the Wales Transport Strategy from 2015 and beyond. The Plan includes all transport interventions financed by the Welsh Government. Welsh Government has committed to publishing annual updates. The 2018 update was published in May 2019 and provides information on progress since 2017 and a revised programme for the next two years and beyond. The 2018 update includes a commitment to major infrastructure improvements to upgrade A483 Junctions 3-6 and for improvements to A483/A5 south of Wrexham to the English border. Delivery schedules in the NTFP reflect the current assumptions about the delivery profile of each scheme and these may be subject to change, recognising the statutory processes that must be completed and the need to be responsive to changing circumstances. Schemes yet to be developed will be taken forward subject to a robust business case analysis demonstrating value for money and future discussions on budget settlements.

2.5 Moving North Wales Forward sets out the Welsh Government's vision for transport in North Wales and the North East Wales Metro and seeks to create a reliable and efficient transport network across the region and across the Wales-England border, connecting people and businesses to jobs and services. The A483 Junction 3 to 6 scheme is a key measure within this vision and will form an important part of plans to support the success of North Wales in the future.

2.6 A number of studies have been produced by Wrexham CBC and Welsh Government that assess the traffic issues on the A483 and identify a range of potential options to address them

2.7 Wrexham CBC commissioned EBT01 Wrexham Strategic Road Network Capacity and Improvement Study (March 2016). Wrexham CBC in partnership with Welsh Government also commissioned two further studies - a Stage 1 WelTAG study on the A483/A5 corridor between Gledrid Roundabout (Chirk) and Rossett Interchange, and a capacity study for J4 (A525 Ruthin Road) and J5 (A541 Mold Road) of the A483.

2.8 WelTAG is the Welsh Government's guidance on best practice for the development, appraisal and evaluation of proposed transport interventions in Wales. It has been developed to ensure that public funds are invested in a way that ensures they maximise contribution to the well-being of Wales, as set out in the Well-being of Future Generations (Wales) Act 20154. The WelTAG process comprises five stages which are intended to cover the lifecycle of a proposed transport intervention, from conception to post-implementation evaluation. The WelTAG process provides decision-makers with information required to make decisions.

2.9 The Stage I WelTAG study (strategic outline case) identified a range of options to address the issues identified on the A483/A5 corridor.

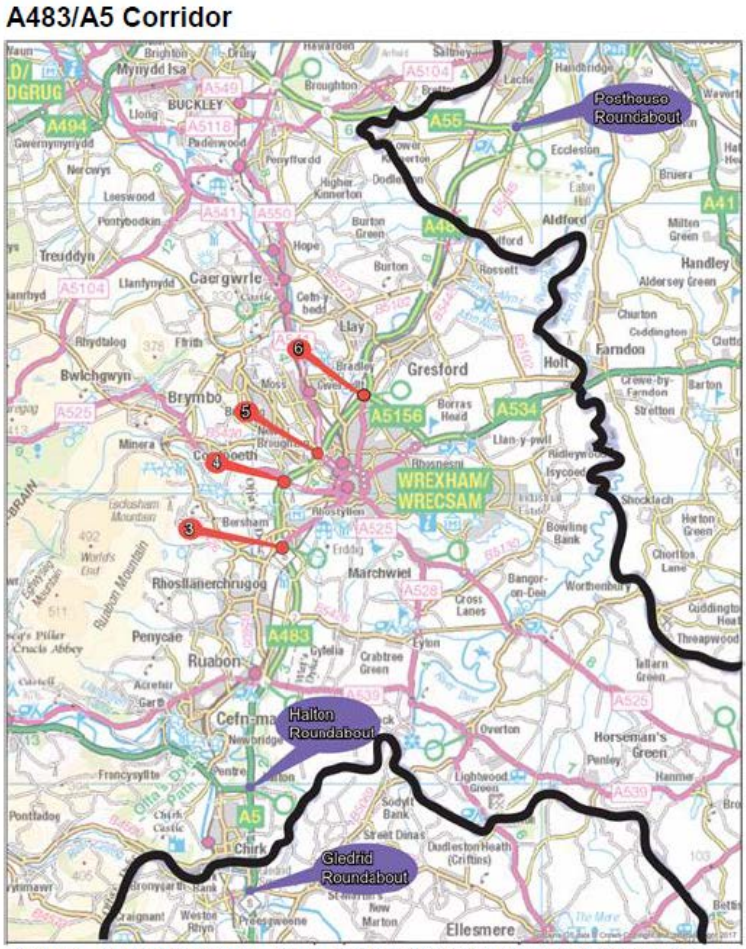
2.10 Welsh Government and NMWTRA have subsequently commissioned Mott MacDonald and their partners Richards, Morehead & Laing to undertake a WelTAG Stage 2 study (outline business case) of A483 J3-6 to assess the options identified for this section of the corridor in more detail with the aim of identifying a preferred solution. This study is currently ongoing.

2. 11 Local and regional growth aspirations rely in part on the A483 and its junctions being able to accommodate additional demand. Traffic flows on the A483/A5 corridor already exceed design standards, with specific highway capacity issues at A483 Junction 4 and to a lesser extent Junction 5 & 6. For Wrexham CBC, the A483/A5 transport corridor is critical to the emerging LDP 2013-2028 and the need to accommodate 7,750 new homes over the next 10 years, along with growth in employment land.

2. 12 Junctions 4, 5 and 6 are especially important to Wrexham and the wider region as these are the key routes into the town to access employment, Wrexham Maelor Hospital, retail, education (University and 6th Form) and other cultural attractions in the town. In particular, the capacity of Junction 4 is a constraint to additional housing and employment growth at Key Strategic Site 1 Lower Berse Farm and Western Gateway Business Park.

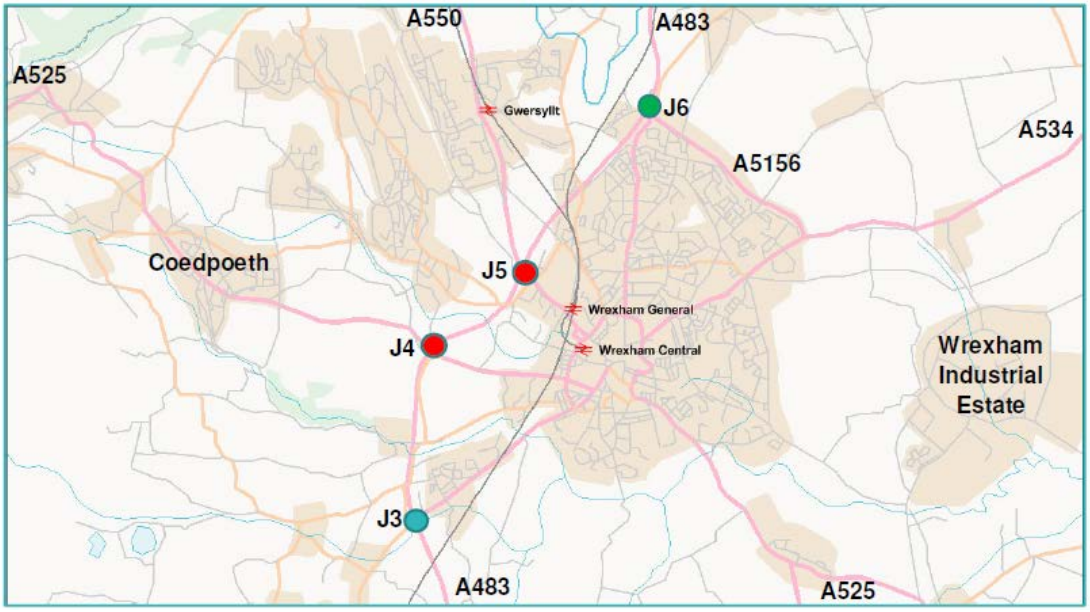
[4] https://gweddill.gov.wales/topics/people-and-communities/people/future-generations-act/?lang=en

Figure 1: A483/A5 Corridor



Source: Mott MacDonald. Contains OS data © Crown copyright and database right 2017

Figure 2: A483 Junctions into Wrexham



3.0 Deposit Wrexham Local Development Plan 2013-2028

3.1 The Local Development Plan contains a number of policies directly related to delivering upgrades to the strategic road network and specifically junctions 4 & 5. There are also developments which are directly tied to these upgrades. This section outlines the relevant policies.

3.2 The economic ambition of the LDP both in relation to the number of new homes and job creation is reflective of the Wales Spatial Plan [5]aspirations for the area and recognises the economic importance of cross border linkages. The focus for growth and investment in housing, jobs, transport infrastructure, education, retail, leisure and services in Wrexham Town, Wrexham Town Centre, including the Masterplan Area and Wrexham Industrial Estate also strengthens Wrexham's position as a Key settlement of National Importance, a Key regeneration area and Key Business Sector Area.

3.3 Strategic Policy SP4 allocates land at Key Strategic Site 1 (Lower Berse Farm) for a minimum of 1500 houses of which 200 would be delivered during the plan period (2013-2028). The policy specifically identifies highways upgrades at junction 4 as enabling Infrastructure (i.e.to facilitate development – Those items which will need to be delivered prior to, or from the commencement of the relevant phases of development) to deliver the site and limits housing delivery to 200 units within the plan period following completion of works at junction 4 of the A483(T) road[6].

3.4 The Western Gateway Employment site (policy EM1, site 9) requires additional capacity at junction 4 of the A483[7].

3.5 Strategic Policy SP6 (Planning Obligations) seeks to mitigate any impacts directly related to development, assessing impacts on a case by case basis in line with relevant planning legislation. Active travel, public transport and highways improvements are all explicitly mentioned as the types of obligations that would be sought.

3.6 Strategic Policy SP8: (Wrexham Town) identifies Wrexham Town as the focus for new development including housing, employment, commercial, retail, leisure, tourism, services, education, transport, infrastructure and the arts in order to strengthen the Town's regional function as a settlement of national importance.

3.7 Detailed policy EM1 protects existing employment areas including Wrexham Western Gateway for B1 uses.

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[5] https://webarchive.nationalarchives.gov.uk/20080911092651/http://new.wales.gov.uk/about/strategy/spatial/?lang=en

[6] See Evidence base documents Weltag 1 (2017), Study 2 report (2017) and Capita report (EBT01, March 2016) https://wrexham-consult.objective.co.uk/portal/ldp_ebsd.

[7] Infrastructure Delivery Plan EBI01 https://wrexham-consult.objective.co.uk/portal/ldp_ebsd

3.8 Transport policy T6 (Strategic Transport Infrastructure Improvements) supports improvements to the strategic transport network and specifically under criteria xi. A5/A483 Junction Improvement (Welsh Government).

4.0 Junction Upgrade Delivery

4.1 The WelTAG stage 2 study on A483 J3-6 is ongoing. A public information event was held on 25 and 27 June 2019 and a 12 week public consultation on potential options is planned to start in autumn 2019.

4.2 Subject to the outcome of the consultation, an announcement on the preferred options is expected in spring 2020.

4.3 It is anticipated that schemes to address the traffic issues on A483 J3-6 will be delivered incrementally over the medium and longer term, with the intention of addressing the most pressing problems first. Therefore the initial focus will be on delivering a scheme to improve traffic conditions at J4 and, subject to satisfactory completion of statutory processes and the availability of funding, construction on a scheme for J4 could start in spring 2022. The planned programme is as follows:

- **Identification of a preferred scheme:** autumn 2019
- **Public consultation:** autumn 2019
- **Public Inquiry (if needed):** spring 2021
- **Estimated construction start date (subject to the Welsh Minister's approval):** spring 2022

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Appendix 1

Extract from Infrastructure Delivery Plan 2013-2028 (EBI01)[8]

Road Network

Lead Organisations/Agencies

• Wrexham County Borough Council

• Welsh Government

• North and Mid-Wales Trunk Road Agency

• Developers

Context

2.41 Car use dominates travel to work and travel generally in the Wrexham County Borough area, traffic counts reduced by 3.4% between 2006 and 2011, after increasing between 2001 and 2006, however, traffic once again has increased since 2013.

2.42 The A483 is a strategic Trans-European Network Transport (TEN-T) route; international routes benefit the North Wales economy with expenditure in the region and offering strategic access to markets for businesses.

2.43 As well as routes having a strategic function for cross border connections, within the region the trunk road network and the main connections to it are vital for providing access to jobs and services. There are substantial movements of people for jobs between and within local authorities on a daily basis. The 2011 Census showed that car travel dominates locally for travel to work journeys, with 69% of commuting travel being car drivers, with a further 9% being car passengers. It also showed 16,739 people (26.3%) commuting out of the authority daily and 14,000 people commuting in. The overwhelming majority of commuting to and from areas outside the Wrexham County Borough is done by car, with a car driver share of 83% from Wrexham and 84% into Wrexham.

2.44 The Joint North Wales Local Transport plan identifies a number of interventions to improve transport network resilience, capacity and safety enhancements/ pinch-point improvements, improved integration with strategic public transport services, improved links to employment and improved access to services.

2.45 Some of the most congested strategic roads in Wrexham include:

• A541 Mold Road

• A525 Wrexham East

[8] EBI01 Infrastructure Plan 2018: https://wrexham-consult.objective.co.uk/file/4927372

• A525 Wrexham West

• A5152 Ruabon Road

• A483T (Junctions 3 through to 6)

• A483T (Glendrid Road South)

• Berse Road, Wrexham

• Croesnewydd Rd/Watery Road Wrexham.

2.46 There are significant capacity constraints with the A483 Junctions 4, 5, and 6 with the local network into Wrexham and with the A483 junction with the A55 outside Chester and at the Gledrid roundabout south of Chirk.

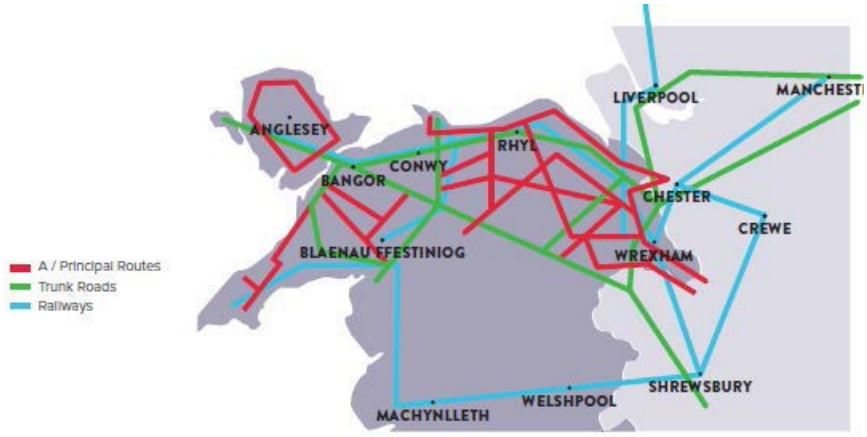
2.47 One of the Key Strategic Site (KSS) allocations, KSS1 is dependent on the completion of enabling infrastructure to deliver the identified allocation (policy SP4 in the deposit plan). A significant amount of work has been done to date with WG transport to assess if there is a suitable solution to release the site in light of known highway infrastructure capacity constraints in particular at junction 4 (J4) of the A483 (T) road[20]

2.48 As a result of the work undertaken to date, potential solutions have been identified which could alleviate the infrastructure capacity constraints at this location, not only to release this land for future housing, but also to ensure that the remaining Western Gateway employment site (policy EM1, site no 9) can be completed. Discussions with WG to date suggest that the work done so far on this issue has been used to update the National Transport Finance Plan[21] (NTFP, 2015).

2.49 The NTFP covers a 5 year timeframe and identifies a number of schemes for improvement across Wales over the period 2015 – 2020 and beyond. The updated NTFP shows activity on the scheme over the final 3 years of the delivery schedule table i.e. 2018/19, 2019/20 and 2020/21. Further information about timescales can be found in Appendix 1.

Existing Provision

Figure 3: Existing road network



Links to Neighbouring Authorities

2.50 The A483 trunk road is a strategic link to mid and south Wales and to Chester and via the A55 to the North West and North Wales coastal area providing employment and business opportunities. Regional transport issues are promoted through the Joint Local Transport Plan and via the Mersey Dee Alliance and North Wales Economic Ambition Board.

Key Issues

2.51 The strategic A483 corridor that runs through the County Borough has pinchpoints to the south of Chirk at Gledrid Roundabout and to the north of the Rossett interchange. Further pinch points are at the junctions off the A483 accessing Wrexham Town Centre (junctions 4 and 5). There are few alternative routes for the major traffic movements which results in traffic converging on the strategic corridors and traffic conditions worsening during peak periods. Delivery of improvements at junction 4 are key to the release of KSS1 and site 9 (Western Gateway as identified in policy EM1).

Infrastructure Requirements

2.52 The infrastructure requirements that are directly related to the allocations are Appendix 1 and 2 below, and there are a number of others that are detailed in policy T6 which relate to the Local Transport Plan.

Estimated Phasing and Delivery

2.53 The tables in Appendix 1 and 2 detail a number of projects that are ongoing within the authority in relation to highway infrastructure, some of which are directly linked to the delivery of the KSS. Others are not directly related to the delivery of the allocations identified in the LDP and they are likely to take place over the lifetime of the plan and will contribute to the delivery of the LDP vision and objectives.

Funding Sources

2.54 Funding sources include WG via the NTFP, developers, the local transport finance plan, regional transport grant and developer contributions.

Active Travel, Public Transport and Highways

Highway Infrastructure									
Delivery Lead	**Type of Infrastructure**	**Scheme Description**	**Locational Factors**	**Potential Funding Sources**	**Delivery Period**	**Estimated Cost**	**Funding Secured**	**Funding Required**	**Status**
WG, Developers	Highway	Junction upgrades and improvements	Junction 4 and 5 483 Trunk road	WG S106	Commencement circa 2020/21	>£15m	In principle	>£15m, exact cost to be Determined following the outcome of further work that is being procured by WG (April 2018).	Enabling

MOTT MACDONALD

Bridgend Replacement Local Development Plan

Technical Note Series

Project:	Bridgend Replacement LDP		
Our reference:	100415574 – TN 003	**Your reference:**	
Prepared by:	Claudia Currie	**Date:**	May 2021
Approved by:	Claudia Currie	**Checked by:**	Margaret Henderson
Subject:	Base Year Review and Junction Model Calibration.		

1 Introduction

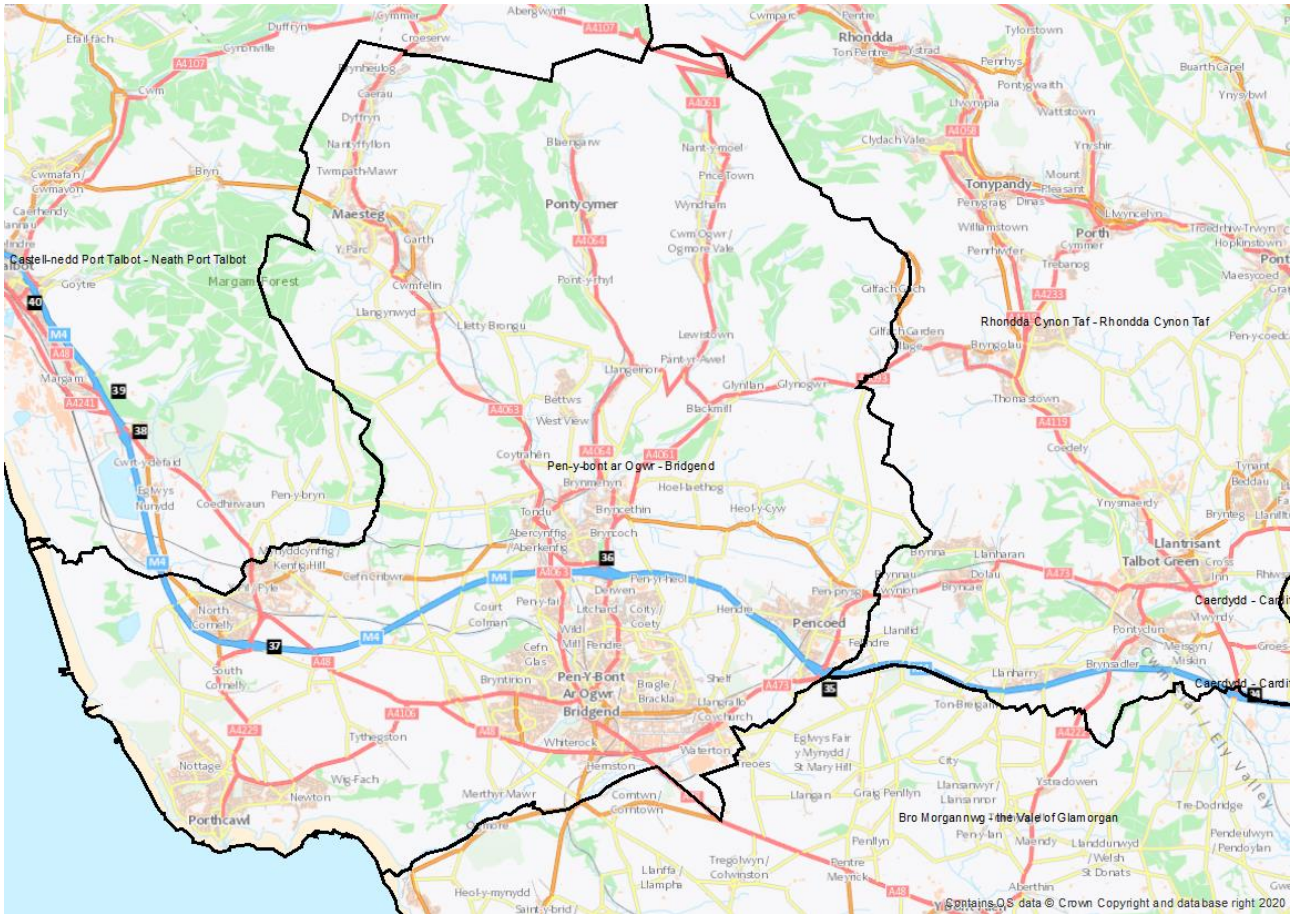
Mott MacDonald was commissioned in January 2020 by Bridgend County Borough Council (BCBC) to develop a series of technical notes to help determine the traffic impact of committed developments and the proposed Candidate Sites on the highway network as part of evidence base supporting the Local Plan development process.

This technical note will report on the base year highway situation using junction modelling tests to determine the impact of traffic at key junctions on the Bridgend highway network and will provide a high level review of the public transport service provision and the existing active travel provision.

The three M4 motorway junctions that are used to access areas within Bridgend County Borough, shown in Figure 1 have not been modelled as they have been separately assessed by the Welsh Government (WG). The reporting on these junctions forms part of a wider WelTAG Stage 1 study, which has confirmed there are no proposed highway changes required at Pencoed Junction 35 and Pyle Junction 37. The WG WelTAG Stage 2 assessment of Sarn Junction 36 will be published in mid 2021.

A high level review of available historic reports considering the operation of the M4 junctions 35, 36 and 37 has been include in Technical Note 2.

Figure 1: Bridgend Area



Source: Mott MacDonald; ArcMap

2 Highway Modelling

The traffic data was collected at the 26 locations listed in Table 1 (A and B), overleaf and in Appendix A, on a neutral Thursday in October 2020 and was collected for the full twelve-hour period between 07:00 and 19:00 with vehicles classified in accordance with DMRB classifications for vehicle types:

- Pedal Cycles
- Motorcycles
- Cars/Taxis
- LGV
- OGV 1
- OGV2
- PSV

These junctions have been modelled using Junctions9 and LINSIG, as appropriate, with the roundabouts and priority junctions being modelled using Junctions9 software and the signal controlled junctions being modelled using LINSIG software. The series of junction modelling tests

have been carried out using the 2020 count data collected on 15th October 2020 as a base and these have then been factored up to pre-COVID levels as detailed in Technical Note 1 (Data).

Table 1A: Network Residual Capacity (priority junctions and roundabouts)

Ref No	Survey Location	Junction Type	Network Residual Capacity	
			AM Peak	PM Peak
1	A4229 Pyle Rd/A4106 Newton Nottage Rd/A4106/Fulmar Rd	Roundabout	45%	48%
2	A48/A4106 Bridgend Road roundabout	Roundabout	67%	85%
3	A48/A473 roundabout	Roundabout	81%	114%
7	A4061/Heol Stradling/W Plas Rd roundabout	Roundabout	40%	64%
9	A4061/A473/Tondu Road roundabout	Roundabout	32%	46%
11	A473/Glan-Y-Parc	Priority junction	27%	26%
12	St Leonards Road/A473	Priority junction	21%	7%
13	Heol-Y-Nant/A473 Park Street	Priority junction	0%	-16%
14	A4061/McArthur Glen	Roundabout	24%	-4%
15	A4061/Litchard Hill/Heol Y Groes	Roundabout	0%	29%
18	A48 Bypass Road/B4622	Roundabout	-19%	-14%
19	A48 Crack Hill/Brocastle Manor	Roundabout	241%	417%
20	A48 Crack Hill/B4524 Corntown Road	Priority junction	40%	94%
21	A4229/A48/Pyle Road	Roundabout	65%	98%
23	A4063/Park Road	Roundabout	14%	19%
24	A4061/Heol Canola	Priority junction	-19%	-7%
25	A4093/A4061/Heol Pant-Yr-Arwel	Priority junction	99%	105%
26	Penybont Road/Hendre Road/Coychurch Road/ Heol-Y-Groes	Priority junction	21%	29%

Table 1B: Network Degree of Saturation (signal controlled junction)

Ref No	Survey Location	Junction Type	Degree of Saturation	
			AM Peak	PM Peak
4	A48 Bypass Road/ B4265 Ewenny Road roundabout	Signalised roundabout	75.1%	72.6%
5	A473/A48 Roundabout	Signalised roundabout	78.3%	84.3%
6	A473 Waterton Road / Brocastle Avenue/ A473 Waterton Road/ B4181 Coychurch Road	Signalised roundabout	104.6%	110.1%
8	A4061 Rotary International Way/B4181 Tremains Road/Boulevard De Villenave/Coity Road	Signalised gyratory	127.9%	75.2%
10	A473 Tondu Road/Angel Street/Park Street	Signalised junction	142.2%	125.1%

16	A473/B4622/Bright Hill	Signalised junction	191.8%	122.3%
17	A483 Cowbridge Road/B4265 Ewenny Road/ A473 Langenau Strasse/Nolton Street	Signalised junction	82.8%	76.2%
22	A4063 Maesteg Road/A4065 Bryn Road/Bridgend Road	Signalised junction	79.1%	91.7%

The operation of priority control junctions and roundabouts is measured in terms of a Ratio to Flow Capacity (RFC) value where a level at or below an RFC of 0.85 is considered to demonstrate a junction is operating well (for the detailed RFC output on each arm see Appendix B). Where junctions are operating with one arm slightly above an RFC of 1.0 there will generally be no noticeable or unacceptable queues and delays seen on the highway network during normal operation and this is indicated for each by a positive network residual capacity.

The operation of signal control junctions is measured in terms of Practical Reserve Capacity (PRC) value where a level at or below 90% is considered to demonstrate a junction is operating well (for the detailed PRC output on each arm see Appendix B). Where junctions are operating with a percentage degree of saturation below 100% on most arms there will generally be no noticeable or unacceptable queues and delays seen on the highway network during normal operation.

However, other external factors such as inappropriately parked or broken down vehicles may cause temporary short lived long queues as can incidents of extreme weather conditions when junctions are operating at or above their theoretical capacity which is measured as an RFC of 1.0 or a percentage degree of saturation of 100% for uncontrolled and signal controlled junctions, respectively.

Table 1 (A and B) provides an indication of the level of operation of each junction in both the AM and PM peak hour with the full output details shown in Appendix B. Junctions known to see congestion in normal traffic flow situations are showing over capacity in Table 1 (A and B) above. This indicates that some local rerouting may occur to avoid the local congestion pinch points, but the BCBC area is generally operating well overall as an uncongested network.

Standard validation techniques using queue length surveys have not been possible due to the COVID suppression of traffic flows. At the time of the survey data collection programme in October 2020 no queuing was seen at any of the counted junctions so local knowledge has been used to ensure that with the COVID uplift factor (1.23) that junctions known to form queues during the AM and PM peaks are reported above as operating close to theoretical capacity. Although it should be noted that many junctions can operate within a congested network with an acceptable level of congestion.

The 26 junction locations modelled above have been modelled using isolated junction modelling software (Junctions9 for priority junctions and roundabouts plus LINSIG for Traffic signal controlled junctions and gyratories). A Mesoscopic model covering a large area of Bridgend south of the M4 has been developed separately to this commission and will be used to provide a high level commentary on the impact of blocking back between junctions when the model is available (mid 2021).

3 Bus Service Provision

Local bus services in BCBC are provided by a number of privately-run bus companies. The County Borough is also served by long distance coaches that provide connections to UK cities including London. Many of these services are currently running a reduced timetable during the COVID19 pandemic period. However, it is anticipated that services will eventually return to a normal service provision in 2021.

The main local operators are

- First Cymru Buses Ltd
- Stagecoach in South Wales
- New Adventure Travel Ltd
- Easyway Minibus Hire Ltd
- Peyton Travel Ltd

The majority of bus services within Bridgend County Borough pass through Bridgend bus station, which is located off Quarella Road in the north of the town centre and is a 300m walk from Bridgend railway station, allowing integrated bus-rail journeys. The main settlements within Bridgend County Borough typically have a minimum of an hourly service linking to Bridgend or to Maesteg or Porthcawl.

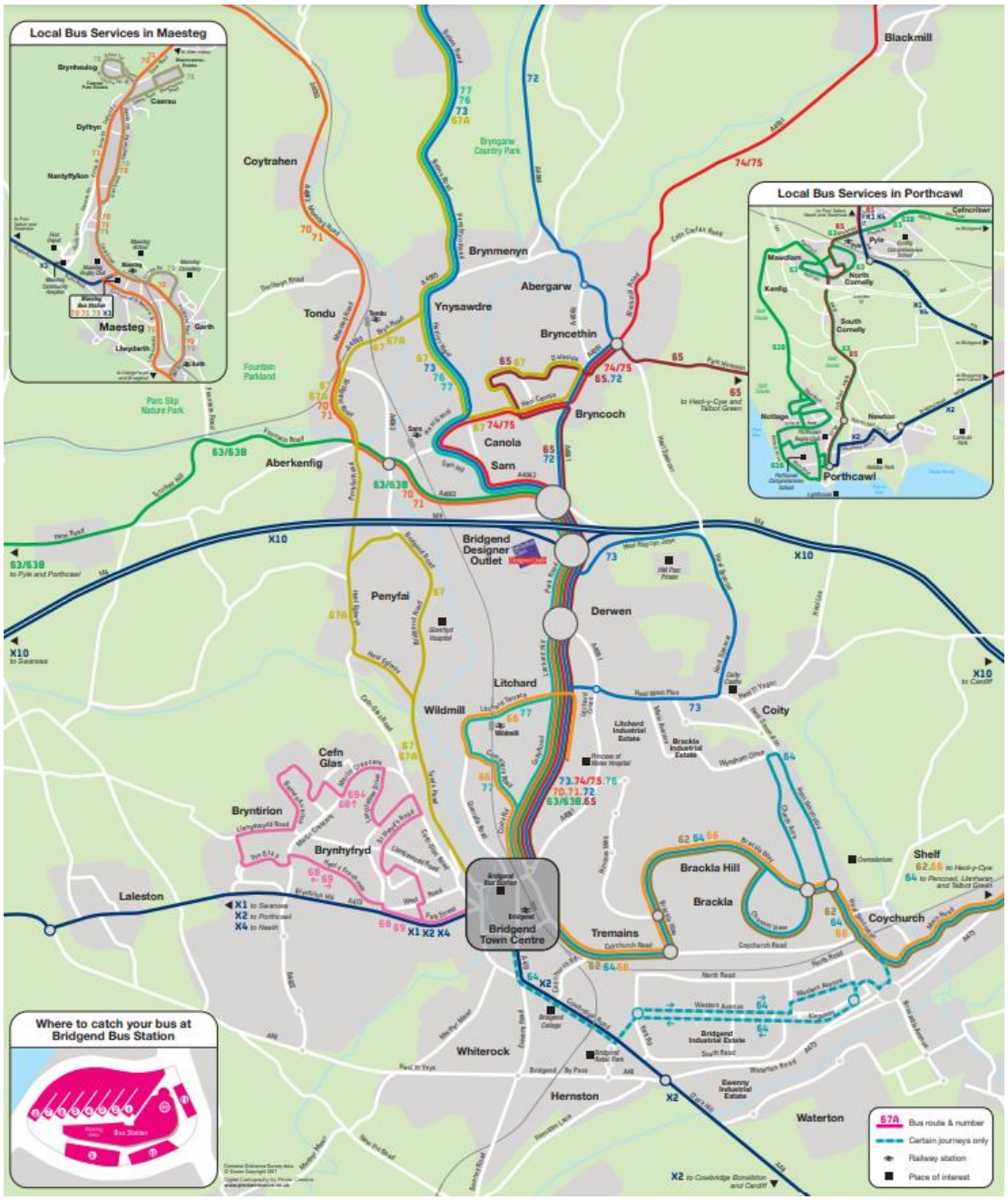
On weekdays there are approximately four services per hour between Bridgend and Maesteg and eight an hour between Bridgend and Porthcawl.

Longer distance services from Bridgend bus station include an hourly service to Swansea and half hourly to Cardiff. In addition, hourly services are available to both Cardiff and Swansea from the Bridgend Designer Outlet.

National Express provides a daily service to/from BCBC via M4 Junction 36 (Sarn), where passengers can transfer to a number of other local bus services.

All developers should be encouraged to promote the use of public transport as a viable mode of travel by providing appropriate facilities such as bus stops and real time timetable information as part of their planning contributions, as well as ‘pump priming’ additional services during early phases of larger developments.

Figure 2: Bridgend Bus Routes



Source: First Bus

4 Rail Service Provision

Bridgend Station is situated halfway between the stations at Cardiff and Swansea and lies on the junction of the South Wales Main Line and the Maesteg Line. The Bridgend Railway Station is the fifth busiest in Wales (1,508,294), behind Cardiff Central (12,670,920), Newport (2,717,124),

Cardiff Queen Street (2,694,084) and Swansea (2,059,952). The Station accommodates regular passenger services to Swansea, Carmarthen and Fishguard in the west, and Cardiff, Reading and London Paddington to the east and there are also services stopping here that run to Manchester Piccadilly.

The Maesteg Line is a commuter railway line in South Wales running from Bridgend to Maesteg with services operating from Maesteg to Cheltenham Spa and Gloucester via the Newport Line. This line is operated by Transport for Wales Rail as part of the Valley Lines network and TfW is in the process of enhancing the rail provision as part of the South Wales Metro.

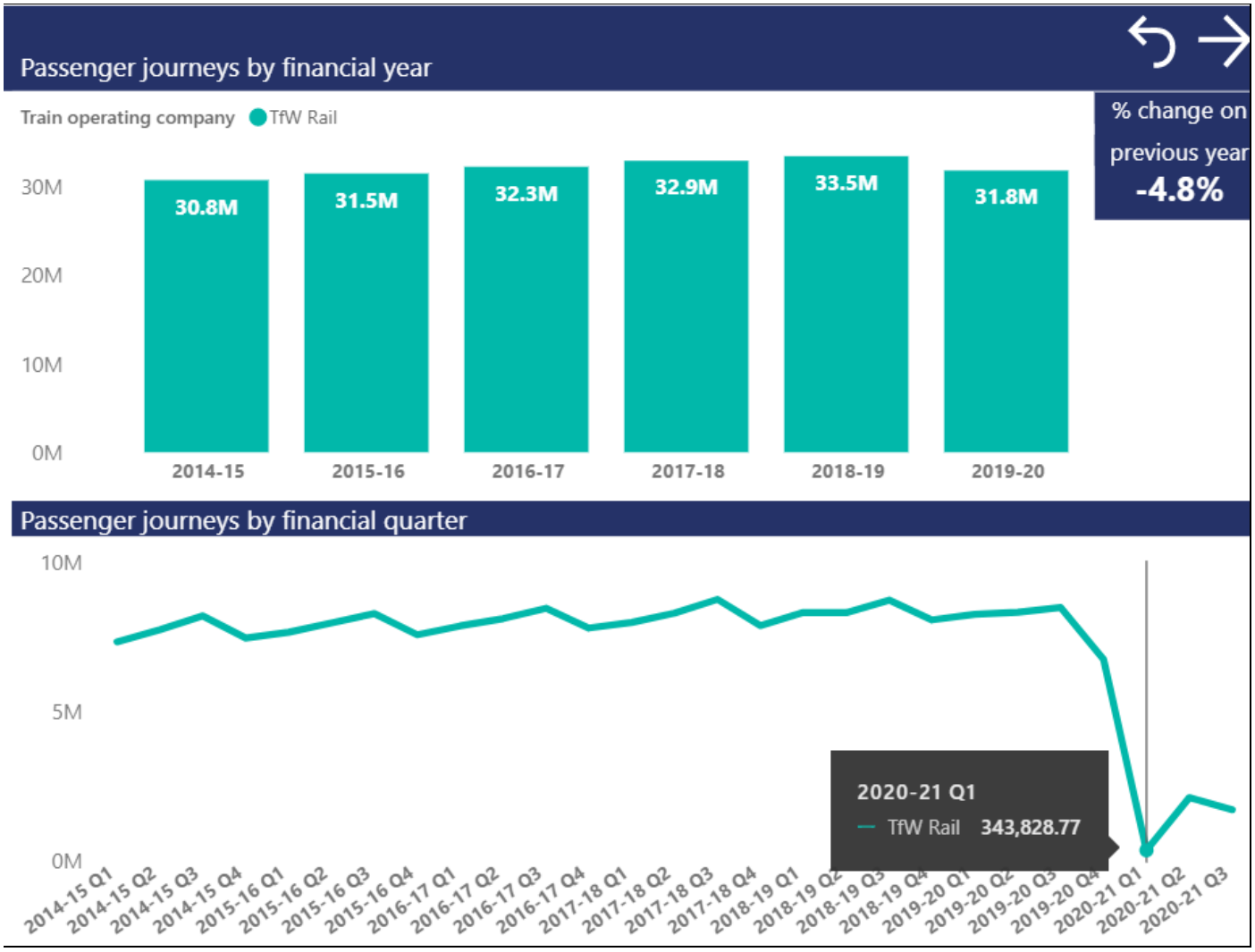
Bridgend is also the western terminus of the Vale of Glamorgan Line, providing a link to Barry and to Rhoose Cardiff International Airport station, where there is a shuttle bus service to Cardiff Airport.

The South Wales Metro will improve public transport connectivity across south east Wales, including Bridgend. As well as increased rail service frequencies, improvements are likely to include integrated ticketing across public transport modes, capacity improvements, improved journey quality and passenger information. There are no significant scheduled improvements to the rail services within the LDP Plan Period that directly impact travel patterns within the Bridgend County boundary area. However the Maesteg Branch Feasibility Study Phase A Strategic Outline Buisness Case (WelTAG 1) was completed by Mott MacDonald in May 2019 and the subsequent WelTAG Stage 2 has recently been commissioned by TfW (March 2021) with a programmed reporting date later in 2021.

Many of the rail services have been impacted by COVID and amended timetables have been in operation for most of 2020 (March onwards) and the early part of 2021. Figure 3,overleaf, from the Office of Rail and Road Passenger Usage Quarterly Report for 2020-21 (published March 2021) shows the level of drop off in passenger numbers for the TfW operated train services as a result of the COVID pandemic and the slow recovery that is continuing to occur.

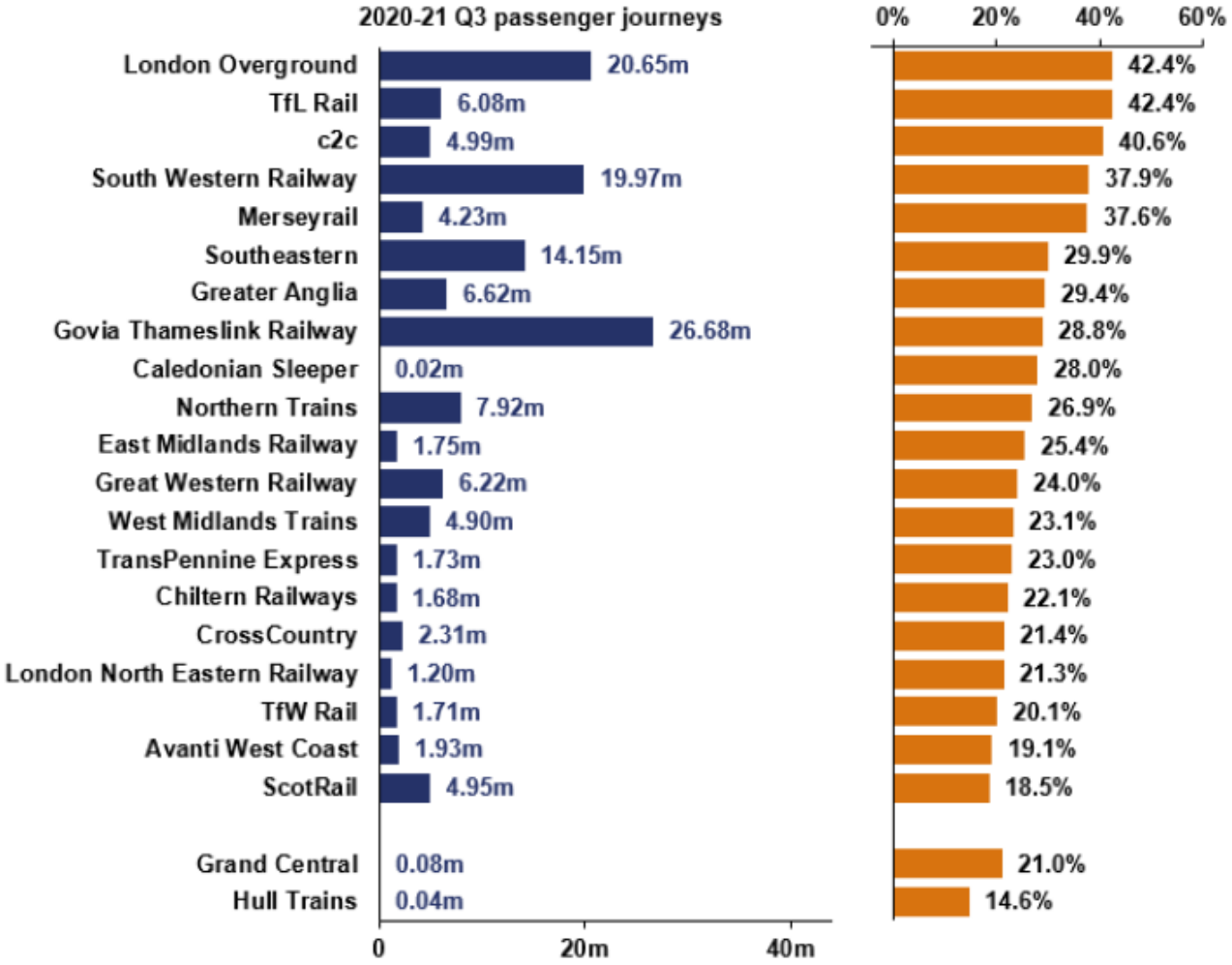
The impact of COVID on passenger rail usage has continued into 2020-21 and usage remains historically low. Across the UK rail passenger levels are still only 30.2% of the levels seen in Q3 2019-20, but they are significantly lower for TfW than this average at only 20.1% as shown by Figure 4 overleaf.

Figure 3: Transport for Wales Passenger Number



Source: Office of Rail and Road: Passenger Rail Usage Quarter 3 (11th March 2021)

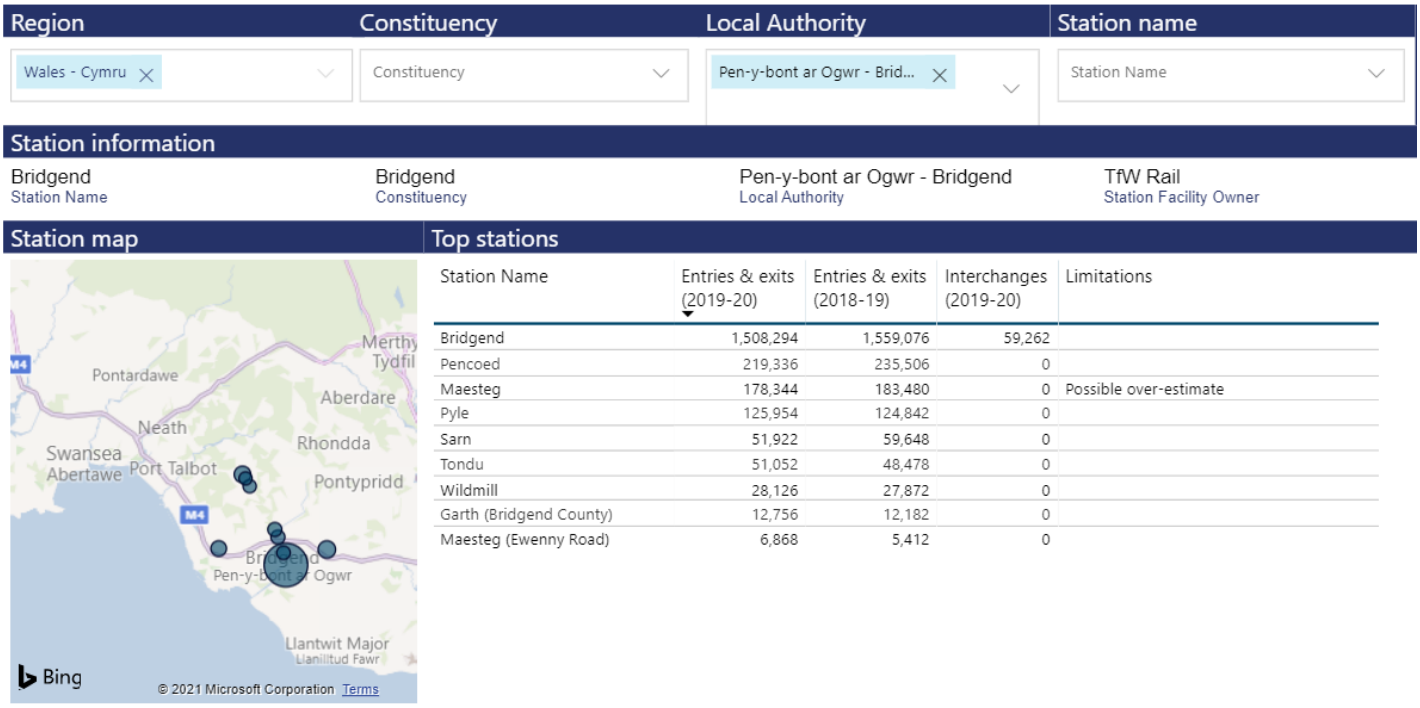
Figure 4: Passenger journeys by operator, 2020-21 Q3, and percentage of 2019-20 Q3



Source: Office of Rail and Road: Passenger Rail Usage Quarter 3 (11th March 2021)

The annual passenger usage of the nine railway stations within Bridgend County Borough are shown in Figure 5 and highlight that the South Wales Main Line station at Bridgend has a significantly higher usage than any of the more local stations. The latest available numbers presented are for the pre-COVID periods 2018/19 and 2019/20. The table also shows that the stations are generally used as destinations with only 3.9% of the trips at Bridgend Station used as an interchange to access the more local services.

Figure 5: Passenger Station Entries and Exits for the Bridgend Area (prior to COVID)



Station Name	Entries & exits (2019-20)	Entries & exits (2018-19)	Interchanges (2019-20)	Limitations
Bridgend	1,508,294	1,559,076	59,262	
Pencoed	219,336	235,506	0	
Maesteg	178,344	183,480	0	Possible over-estimate
Pyle	125,954	124,842	0	
Sarn	51,922	59,648	0	
Tondu	51,052	48,478	0	
Wildmill	28,126	27,872	0	
Garth (Bridgend County)	12,756	12,182	0	
Maesteg (Ewenny Road)	6,868	5,412	0	

Source: Office of Rail and Road: Passenger Rail Usage Quarter 3 (11th March 2021)

Ongoing improvements of rail services through increased stopping frequencies and provision of services such as Park & Ride, cycle storage plus integrated bus services will help support the recovery of the COVID hit rail services with the Bridgend Boundary Area. It is anticipated that studies into possible improvements that had previously been paused will now be progressed in support of the Welsh Government's new Transport Strategy 2021 (Llwybr Newydd – The Wales Transport Strategy 2021).

The current allocation for car parking and cycle stand provision at these stations is detailed below in Table 2, below, however in some cases nearby on-street parking may be available.

Table 2: Rail Car parking and Cycle Stand Provision

Station Location	Car Park Provision	Cycle Stands
Bridgend	102	Yes
Pencoed	No	Yes
Maesteg	12	Yes
Pyle	15	Yes
Sarn	No	Yes
Tundu	No	Yes
Wildmill	No	Yes
Garth (Bridgend County/Mid Glamorgan)	No	Yes
Maesteg (Ewenny Road)	No	Yes

Source: NationalRail.co.uk (March 2021)

5 Active Travel Provision

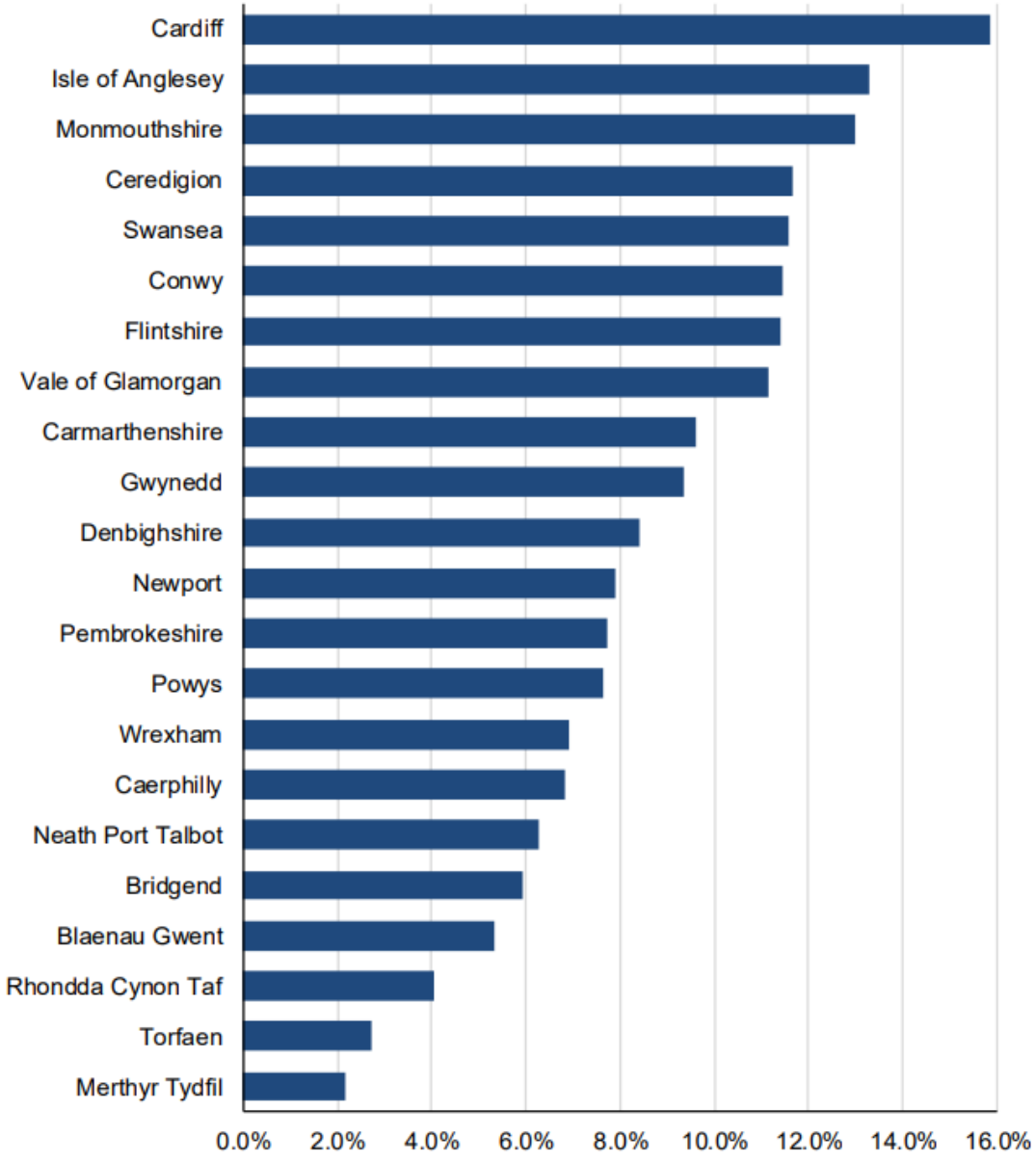
“Active travel” is walking or cycling as a means of transport; that is walking or cycling in order to get to a particular destination such as school, work, shops, visit friends and many other journeys. It does not cover walking or cycling done purely for pleasure, for health reasons or for training. The Active Travel (Wales) Act 2013 was developed to help encourage and facilitate connections between key sites such as workplaces, hospitals, schools and shopping areas with active travel routes and encourage people to rely less on their cars when making short journeys.

The baseline information on active travel for BCBC shown in Figures 6 and 7 show the level of travel made by cyclists and pedestrians during 2018/19. This data has been used as it is not distorted by the higher level of travel by these modes under Covid19 restrictions, much of which would be classed as leisure activities. However, care must be taken in drawing conclusions as the data is known to come from small samples which therefore cannot be defined as statistically reliable.

From the data available it is evident that BCBC has a low rate of cycle use for active travel compare to other areas of Wales which has resulted from the current lack of provision for cyclists between the built up areas within the County Boundary. This will improve with the implementation of the proposed improvements to the cycle networks within the county which are being promoted through the Integrated Network Maps and the additional WG allocation of Active Travel Funds. From the data available it is evident that BCBC has a high level of pedestrians walking within the County, when compared to the rest of wales, but this is likely to be in the more built up areas where shorter trips are better served on foot.

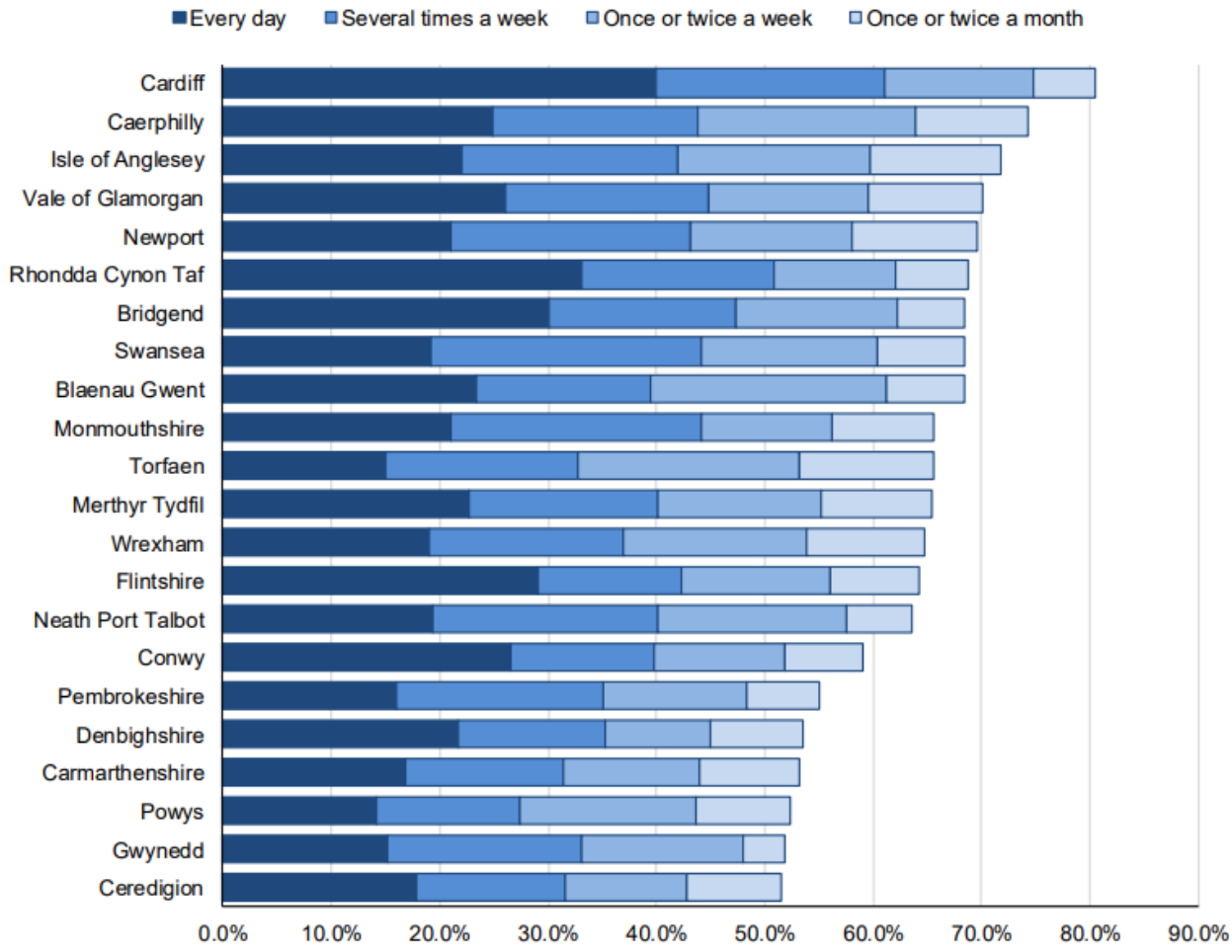
The WG Statistics Bulletin Walking and Cycling in Wales: Active Travel 2018-2019 defines Active Travel as “*walking or cycling for at least 10 minutes whether for all or part of the journey, to get to a particular destination”*

Figure 6: Active Travel by Bicycle, more often than once a month, by Unitary Authority



Source: WG Statistic Bulletin 13 Nov 2019 Waling and Cycling in Wales : Active Travel 2018-19

Figure 7: Active Travel by Walking, by Unitary Authority



Source: WG Statistic Bulletin 13 Nov 2019 Waling and Cycling in Wales : Active Travel 2018-19

BCBC has mapped existing and future active travel routes which are shown in overview in Appendix C. However, these maps show that within the existing provision there are significant gaps between the built up areas, but there are already short, medium and long term plans to improve these facilities.

Further details of the routes proposed are included in the BCBC published documents updating the *Integrated Network Map* and *Existing Routes Maps* which was completed in 2018 and are located here - Active Travel routes - Bridgend CBC.

BCBC has commissioned a study to review the Active Travel Integrated Network Maps (ITM) and Ancillary Active Travel Schemes. The draft ITM resulting from this work has been published for consultation (closed 18/04/2021). Analysis of the comments is now underway and any further updates to the maps will be published in May 2021. A revised active travel network map will be published following WG approval later in the year.

Further improvements to the active travel network for the financial year 2021/22 include the following, for which Welsh Government Active Travel Grant funding has been allocated:

- Bridgend to Pencoed (Phase 2): This scheme will complete missing links in the network close to the Bridgend College Pencoed Campus and connecting Coychurch Roundabout to Kingsway. It will provide a link along the A473 between Waterton Roundabout and Bridgend town centre. Proposed future schemes include a link between Waterton and Coychurch Roundabouts; and
- Pyle to Porthcawl (Phase 1).

As well as the above schemes, significant funding has also been granted by WG to provide incremental network-wide improvements, promotion, monitoring, feasibility and design of future schemes.

All developers should be encouraged to promote the use of active travel as a viable mode of travel by contributing to improvements to, and new sections of, the pedestrian and cycle facilities in line with the Integrated Network Maps.

Within the transport assessment provided as part of the candidate site submissions there is some evidence of contributions to active travel improvements which will need to be enhanced and brought forward as part of the planning process.

6 Conclusion

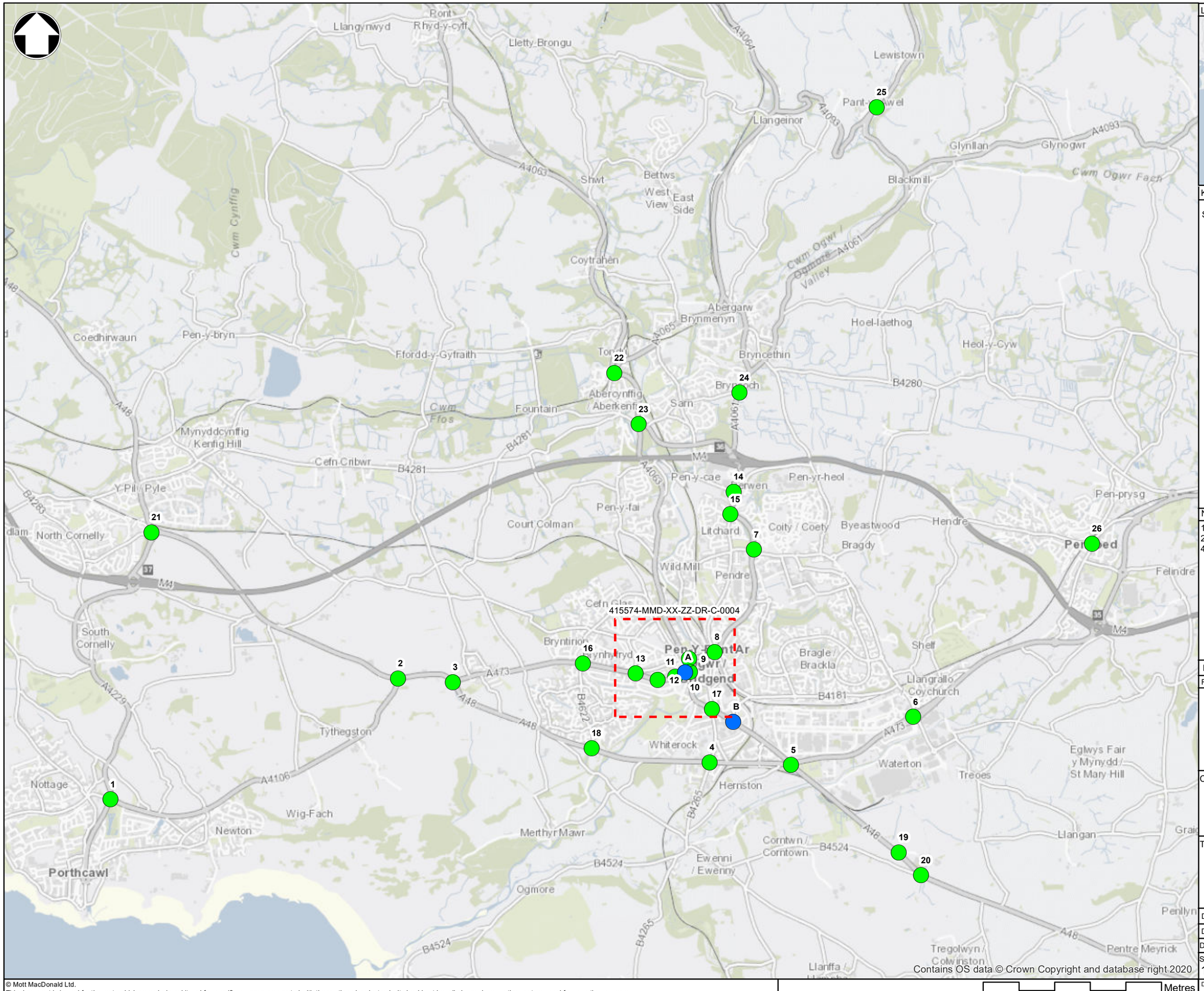
Technical Note 3 has summarised the baseline 2020 situation of the operation of junctions at key locations and has provided a high level review of public transport service provision, rail service provision and the existing active travel provision.

7 Recommendation

The review of public transport service provision has shown no significant gaps, however all new developments should ensure that routes to access these modes of travel are provided and where possible existing bus routes should be extended or diverted into new development sites.

Active travel provision currently has significant gaps in the BCBC area, but there are clear plans shown on the Integrated Network Maps developed by BCBC to which all developers should be required to contribute to improve the active travel network for both pedestrians and cyclists.

A. Appendix A – Survey Location Plan



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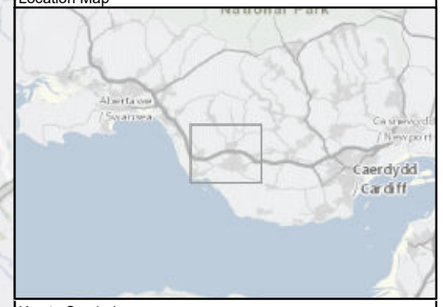
Location Map



Key to Symbols

Survey locations

- ATC
- JTC

Notes

1. For information only.
2. To be read in conjunction with: 415574-MMD-XX-ZZ-DR-C-0004

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	25/01/21	JW	For information	MH	CC

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Client: Bridgend County Borough Council

Title: Bridgend Traffic Survey Scoping Survey Locations

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Drawn	J Wu	JW	Coordination	M Henderson	MH
Dwg Check	J Keane	JK	Approved	C Currie	CC

Scale at A3	Status	Rev	Security
1:50,000	INF	P1	STD

Drawing Number: 415574-MMD-XX-ZZ-DR-C-0003

Metres: 0 500 1,000 1,500 2,000 2,500

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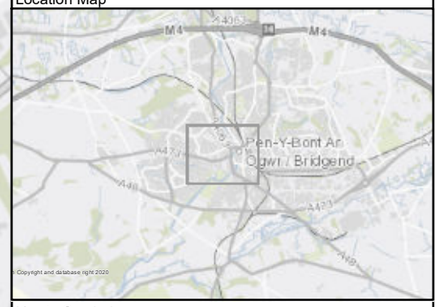
Location Map



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Scale at A3	Status	Rev	Security
1:5,000	INF	P1	STD

Drawing Number: 415574-MMD-XX-ZZ-DR-C-0004

Metres: 0 50 100 150 200 250

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Appendix B – Junction Modelling Output Summary Tables

This report provides an overview of the junction modelling undertaken to assess the capacity at which junctions are operating in both the AM and PM peak hour. The arms of each junction are labelled clockwise and the corresponding road names are provided below.

Junction Arms- Road Names

Junction	Arm	Description
Junction 1	Arm 1	Pyle Road
	Arm 2	Newton Nottage Road
	Arm 3	A4106
	Arm 4	Fulmar Road
Junction 2	Arm 1	A48 (east)
	Arm 2	Bridgend Road
	Arm 3	A48 (west)
Junction 3	Arm 1	A473
	Arm 2	A48 (south)
	Arm 3	A48 (north)
Junction 4	Arm 1	B4265 (north)
	Arm 2	A48 (east)
	Arm 3	B4265 (south)
	Arm 4	A48 (west)
Junction 5	Arm A	A473 Waterton Road
	Arm B	A48 Cowbridge Road
	Arm C	Shopping Centre Access
	Arm D	A48 Bypass Road
	Arm E	A473 Cowbridge Road
Junction 6	Arm A	B4181 Coychurch Road
	Arm B	A473 Coychurch Road
	Arm C	Brocastle Avenue
	Arm D	A473 Waterton Road
	Arm E	David Street
Junction 7	Arm A	A473 Waterton Road
	Arm B	A48 (east)
	Arm C	Retail Park
	Arm D	A48
	Arm E	A473 Cowbridge Road
Junction 8	Arm A	A4061 Rotary International Way
	Arm B	B4181 Tremains Road
	Arm C	A4061 (west)
	Arm D	Coity Road
Junction 9	Arm 1	Boulevard De Villenave D'Ornon
	Arm 2	Tondu Road (south)
	Arm 3	Tondu Road (north)
Junction 10	Arm A	Tondu Road
	Arm B	Angel Street
	Arm C	A473
	Arm D	Park Street
Junction 11	Arm 1	B473 (east)
	Arm 2	Glan-Y-Parc
	Arm 3	B473 (west)
Junction 12	Arm A	St Leonard's Road
	Arm B	A473 (east)
	Arm C	Unnamed Road
	Arm D	A473 (west)
Junction 13	Arm A	Heol-Y-Nant
	Arm B	Park Street (east)
	Arm C	Park Street (west)
Junction 14	Arm 1	A4061
	Arm 2	Litchard Hill
	Arm 3	Retail Park (east)
	Arm 4	Retail Park (Sainsbury's Entrance)

Junction 15	Arm 1	Litchard Hill (north)
	Arm 2	A4061
	Arm 3	Litchard Hill (south)
	Arm 4	Heol-Y-Groes
Junction 16	Arm A	A473 Waterton Road
	Arm B	A48 (east)
	Arm C	Retail Park
	Arm D	A473 Langenau Strasse
	Arm E	A473 Cowbridge Road
Junction 17	Arm A	Nolton Street
	Arm B	A473 Cowbridge Road
	Arm C	B4265
	Arm D	A473
Junction 18	Arm 1	B4622
	Arm 2	A48 (east)
	Arm 3	A48 (west)
Junction 19	Arm 1	Unnamed access
	Arm 2	Brocastle Manor Care Home
	Arm 3	A48 (east)
	Arm 4	A48 (west)
Junction 20	Arm A	A48 (towards Ewenny)
	Arm B	B4524
	Arm C	A48 (towards Bridgend)
Junction 21	Arm 1	A48 (north)
	Arm 2	A48 (east)
	Arm 3	A4229
	Arm 4	Unnamed road (towards North Cornelly)
Junction 22	Arm A	Bryn Road
	Arm B	A4063
	Arm C	Bridgend Road
	Arm D	Maesteg Road
Junction 23	Arm 1	A4063 (north)
	Arm 2	A4063 (east)
	Arm 3	A4063 (south)
	Arm 4	B4281
Junction 24	Arm A	A4061 (north)
	Arm B	A4061 (south)
	Arm C	Heol Canola
Junction 25	Arm A	Heol Pant-Yr-Awel (leading onto Blackmill Road)
	Arm B	A40461
	Arm C	A4093
	Arm D	Heol Pant-Yr-Awel (leading onto Woodland Terrace)
Junction 26	Arm A	Penybont Road
	Arm B	Heol-Y-Groes
	Arm C	Coychurch Road
	Arm D	Hendre Road

Junction 1, Arcady 9 – Roundabout Module

Table 1: Summary of Junction Performance, Junction 1

	AM						PM					
	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020											
Arm 1	D1	1.3	5.34	0.57	A	45 % [Arm 4]	D2	1.4	5.36	0.58	A	48 % [Arm 1]
Arm 2		1.3	5.94	0.57	A			1.2	5.50	0.54	A	
Arm 3		0.4	2.19	0.26	A			0.3	2.14	0.26	A	
Arm 4		1.2	6.64	0.54	A			0.7	4.89	0.41	A	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 2. Arcady 9 – Roundabout Module

Table 2: Summary of Junction Performance, Junction 2

	AM								PM								
	Set ID	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity	Set ID	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity
	2020																	
Arm 1	D1	0.9	1.4	3.01	0.48	A	3.49	A	67 % [Arm 2]	D2	1.1	1.5	3.15	0.52	A	3.18	A	85 % [Arm 1]
Arm 2		0.9	2.2	5.04	0.46	A					0.6	2.7	4.12	0.37	A			
Arm 3		0.6	2.8	2.93	0.38	A					0.5	2.1	2.54	0.33	A			

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 3, Arcady 9 – Roundabout Module

Table 3: Summary of Junction Performance, Junction 3

	AM								PM								
	Set ID	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity	Set ID	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity
	2020																	
Arm 1	D1	0.6	2.8	3.82	0.38	A	3.10	A	81 % [Arm 1]	D2	0.4	1.1	2.92	0.28	A	2.74	A	114 % [Arm 3]
Arm 2		0.1	0.5	3.33	0.07	A					0.1	0.5	3.19	0.08	A			
Arm 3		1.0	1.5	2.67	0.50	A					0.8	1.9	2.33	0.44	A			

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 4, LINSIG

Table 4a: Junction 4 (AM)

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: A48 Ewenny Roundabout	-	-	-		-	-	-	-	-	-	**75.1%**	**0**	**0**	**0**	**23.4**	-	-
A48 Ewenny Roundabout	-	-	-		-	-	-	-	-	-	**75.1%**	**0**	**0**	**0**	**23.4**	-	-
1/1	Entry A48 Bypass Road (W) Ahead Left	U	D		1	33	-	453	1926	728	62.3%	-	-	-	3.7	29.3	10.0
1/2+1/3	Entry A48 Bypass Road (W) Ahead	U	D		1	33	-	566	2080:2080	713+123	67.7 : 67.7%	-	-	-	4.6	29.1	11.5
2/1	Ahead	U	E		2	46	-	389	1940	1035	37.6%	-	-	-	0.5	4.3	0.9
2/2	Ahead	U	E		2	46	-	498	2080	1109	44.9%	-	-	-	0.6	4.2	1.2
2/3	Right	U	E		2	46	-	83	1857	990	8.4%	-	-	-	0.1	3.2	0.2
3/1+3/2	Entry B4265 Ewenny Road (N) Left Ahead	U	L		1	13	-	309	1870:2080	291+139	71.8 : 71.8%	-	-	-	4.3	49.9	6.2
4/1	Exit A48 Bypass Road (E)	U	-		-	-	-	401	1940	1940	20.7%	-	-	-	0.1	1.2	0.1
4/2	Exit A48 Bypass Road (E)	U	-		-	-	-	591	2080	2080	28.4%	-	-	-	0.2	1.2	0.2
5/1	Exit B4265 Ewenny Road (N)	U	-		-	-	-	400	1940	1940	20.6%	-	-	-	0.1	1.2	0.1
6/1	Ahead	U	I		1	36	-	186	1940	798	23.3%	-	-	-	0.7	12.7	2.1
6/2	Right	U	I		1	36	-	101	1857	763	13.2%	-	-	-	0.1	2.9	0.1
7/1	Entry A48 Bypass Road (E) Left Ahead	U	F		1	41	-	227	1908	890	25.5%	-	-	-	1.1	17.3	3.6
7/2+7/3	Entry A48 Bypass Road (E) Ahead	U	F		1	41	-	297	1940:1940	746+239	30.2 : 30.2%	-	-	-	1.4	16.8	3.6
8/2+8/1	Entry B4265 Ewenny Road (S) Left Ahead	U	M		1	17	-	340	2080:1913	166+286	75.1 : 75.1%	-	-	-	4.5	48.1	7.6
9/1	Exit B4265 Ewenny Road (S)	U	-		-	-	-	294	1940	1940	15.2%	-	-	-	0.1	1.1	0.1
10/1	Ahead	U	G		1	63	-	119	1940	1380	8.6%	-	-	-	0.0	1.4	0.0
10/2	Ahead	U	G		1	63	-	320	1940	1380	23.2%	-	-	-	0.2	2.3	0.4
10/3	Right	U	G		1	63	-	78	1732	1232	6.3%	-	-	-	0.0	1.7	0.0
12/1	Ahead	U	J		1	36	-	222	1940	798	27.8%	-	-	-	0.9	14.5	2.1
12/2	Right	U	J		1	36	-	129	1732	712	18.1%	-	-	-	0.2	6.4	0.6
Ped Link: P1	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P2	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P3	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P4	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P5	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P6	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P7	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P8	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf

C1	Stream: 1 PRC for Signalled Lanes (%):	19.8	Total Delay for Signalled Lanes (pcuHr):	22.84	Cycle Time (s):	90
C1	Stream: 2 PRC for Signalled Lanes (%):	0.0	Total Delay for Signalled Lanes (pcuHr):	0.00	Cycle Time (s):	90
	PRC Over All Lanes (%):	19.8	Total Delay Over All Lanes(pcuHr):	23.39		

Table 4b: Junction 4 (PM)

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: A48 Ewenny Roundabout	-	-	-		-	-	-	-	-	-	**72.6%**	**0**	**0**	**0**	**20.3**	-	-
A48 Ewenny Roundabout	-	-	-		-	-	-	-	-	-	**72.6%**	**0**	**0**	**0**	**20.3**	-	-
1/1	Entry A48 Bypass Road (W) Ahead Left	U	D		1	36	-	274	1929	793	34.6%	-	-	-	1.6	21.7	4.9
1/2+1/3	Entry A48 Bypass Road (W) Ahead	U	D		1	36	-	378	2080:2080	762+149	41.5 : 41.5%	-	-	-	2.2	21.4	5.8
2/1	Ahead	U	E		2	46	-	266	1940	1035	25.7%	-	-	-	0.3	3.8	0.6
2/2	Ahead	U	E		2	46	-	349	2080	1109	31.5%	-	-	-	0.4	3.7	0.7
2/3	Right	U	E		2	46	-	62	1857	990	6.3%	-	-	-	0.1	3.2	0.1
3/1+3/2	Entry B4265 Ewenny Road (N) Left Ahead	U	L		1	13	-	323	1910:2080	297+176	68.3 : 68.3%	-	-	-	4.2	47.1	5.9
4/1	Exit A48 Bypass Road (E)	U	-		-	-	-	267	1940	1940	13.8%	-	-	-	0.1	1.1	0.1
4/2	Exit A48 Bypass Road (E)	U	-		-	-	-	390	2080	2080	18.8%	-	-	-	0.1	1.1	0.1
5/1	Exit B4265 Ewenny Road (N)	U	-		-	-	-	217	1940	1940	11.2%	-	-	-	0.1	1.0	0.1
6/1	Ahead	U	I		1	33	-	222	1940	733	30.3%	-	-	-	0.7	10.7	1.7
6/2	Right	U	I		1	33	-	121	1857	702	17.2%	-	-	-	0.1	3.3	0.6
7/1	Entry A48 Bypass Road (E) Left Ahead	U	F		1	44	-	486	1917	959	50.7%	-	-	-	2.5	18.9	8.6
7/2+7/3	Entry A48 Bypass Road (E) Ahead	U	F		1	44	-	501	1940:1940	935+51	50.8 : 50.8%	-	-	-	2.6	18.5	8.4
8/2+8/1	Entry B4265 Ewenny Road (S) Left Ahead	U	M		1	14	-	283	2080:1907	147+242	72.6 : 72.6%	-	-	-	4.0	50.7	6.1
9/1	Exit B4265 Ewenny Road (S)	U	-		-	-	-	385	1940	1940	19.8%	-	-	-	0.1	1.2	0.1
10/1	Ahead	U	G		1	66	-	323	1940	1444	22.4%	-	-	-	0.1	1.6	0.1
10/2	Ahead	U	G		1	66	-	595	1940	1444	41.2%	-	-	-	0.4	2.5	0.7
10/3	Right	U	G		1	66	-	27	1732	1289	2.1%	-	-	-	0.0	1.5	0.0
12/1	Ahead	U	J		1	33	-	135	1940	733	18.4%	-	-	-	0.4	11.5	0.9
12/2	Right	U	J		1	33	-	107	1732	654	16.4%	-	-	-	0.2	6.1	0.6
Ped Link: P1	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P2	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P3	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P4	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P5	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P6	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P7	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P8	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf

C1	Stream: 1 PRC for Signalled Lanes (%):	24.0	Total Delay for Signalled Lanes (pcuHr):	19.87	Cycle Time (s):	90	
C1	Stream: 2 PRC for Signalled Lanes (%):	0.0	Total Delay for Signalled Lanes (pcuHr):	0.00	Cycle Time (s):	90	
	PRC Over All Lanes (%):	24.0	Total Delay Over All Lanes(pcuHr):	20.26			

Junction 5, LINSIG

Table 5a: Junction 5 (AM)

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: A473 A48 Waterton Rbt	-	-	-		-	-	-	-	-	-	**78.3%**	**0**	**0**	**0**	**45.1**	-	-
A473 A48 Waterton Rbt	-	-	-		-	-	-	-	-	-	**78.3%**	**0**	**0**	**0**	**45.1**	-	-
1/1	Ahead Left	U	C1:A		1	34	-	584	1929	750	77.8%	-	-	-	5.6	34.7	14.4
1/2	Ahead	U	C1:A		1	34	-	237	2080	809	29.3%	-	-	-	1.5	22.1	4.3
2/1	Ahead	U	C1:D		2	41	-	627	1830	874	71.7%	-	-	-	1.7	10.0	4.0
2/2	Ahead	U	C1:D		2	41	-	244	1962	937	26.0%	-	-	-	0.3	4.9	1.3
3/1	Ahead	U	-		-	-	-	299	1911	1911	15.6%	-	-	-	0.1	1.1	0.1
3/2	Ahead Ahead2	U	-		-	-	-	598	2040	2040	29.3%	-	-	-	0.2	1.2	0.2
3/3	Ahead	U	-		-	-	-	431	1990	1990	21.7%	-	-	-	0.1	1.2	0.1
4/1	Ahead	U	C1:C		1	17	-	270	1838	368	73.4%	-	-	-	3.9	51.7	7.6
4/2	Ahead	U	C1:C		1	17	-	187	1971	394	47.4%	-	-	-	2.1	40.5	4.6
5/1		U	-		-	-	-	291	1940	1940	15.0%	-	-	-	0.1	1.1	0.1
5/2		U	-		-	-	-	474	2080	2080	22.8%	-	-	-	0.1	1.1	0.1
6/1	Left Ahead	U	-		-	-	-	620	1853	1853	33.5%	-	-	-	0.3	1.5	0.3
6/2	Left Ahead	U	-		-	-	-	1005	1999	1999	50.3%	-	-	-	0.5	1.8	0.5
7/1		U	-		-	-	-	299	1940	1940	15.4%	-	-	-	0.1	1.1	0.1
7/2		U	-		-	-	-	508	2080	2080	24.4%	-	-	-	0.2	1.1	0.2
8/2+8/3	Right Ahead	U	-		-	-	-	928	2013:1860	1043+896	47.9 : 47.9%	-	-	-	0.5	1.9	14.4
9/1	Left	U	C2:A		1	33	-	530	1838	694	76.3%	-	-	-	5.2	35.2	13.1
9/2	Left	U	C2:A		1	33	-	574	1971	745	77.1%	-	-	-	5.6	34.9	14.2
10/1		U	-		-	-	-	87	1940	1940	4.5%	-	-	-	0.0	1.0	0.0
10/2		U	-		-	-	-	479	2080	2080	23.0%	-	-	-	0.1	1.1	0.1
11/1		U	-		-	-	-	653	1940	1940	33.7%	-	-	-	0.3	1.4	0.3
11/2		U	-		-	-	-	113	2080	2080	5.4%	-	-	-	0.0	0.9	0.0
12/1	Ahead	U	C2:C		1	19	-	188	1940	431	43.6%	-	-	-	2.0	37.5	4.4
12/2	Ahead	U	C2:C		1	19	-	362	2080	462	78.3%	-	-	-	5.1	50.3	10.2
13/1	Right	U	C1:B		1	32	-	90	1848	678	13.3%	-	-	-	0.2	7.7	0.6
13/2	Right	U	C2:B		1	34	-	431	1981	770	55.9%	-	-	-	3.1	25.8	10.9
14/1	Right	U	C2:D		2	40	-	533	1940	905	58.9%	-	-	-	1.3	8.6	2.6
14/2	Right	U	C2:D		2	40	-	526	2080	971	54.2%	-	-	-	1.0	6.6	2.2
15/1	Right Ahead	U	C1:B		1	32	-	386	1921	704	54.8%	-	-	-	1.6	15.0	5.2
15/2	Right Ahead	U	C1:B		1	32	-	429	2079	762	56.3%	-	-	-	2.0	16.9	7.1
19/1	Ahead	U	C1:I		1	75	-	653	1940	1638	39.9%	-	-	-	0.4	2.1	0.8
19/2	Ahead	U	C1:I		1	75	-	113	1940	1638	6.9%	-	-	-	0.0	1.2	0.0
Ped Link: P1	Unnamed Ped Link	-	C1:E		1	21	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P2	Unnamed Ped Link	-	C1:J		1	7	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P3	Unnamed Ped Link	-	C1:F		1	36	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P4	Unnamed Ped Link	-	C1:H		1	21	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P5	Unnamed Ped Link	-	C1:G		1	36	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P6	Unnamed Ped Link	-	C2:F		1	35	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P7	Unnamed Ped Link	-	C2:E		1	22	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P8	Unnamed Ped Link	-	C2:H		1	22	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P9	Unnamed Ped Link	-	C2:G		1	35	-	0	-	0	0.0%	-	-	-	-	-	-

C1 - West	Stream: 1 PRC for Signalled Lanes (%):	15.6	Total Delay for Signalled Lanes (pcuHr):	18.95	Cycle Time (s): 90
C1 - West	Stream: 2 PRC for Signalled Lanes (%):	125.8	Total Delay for Signalled Lanes (pcuHr):	0.42	Cycle Time (s): 90
C2 - East	Stream: 1 PRC for Signalled Lanes (%):	14.9	Total Delay for Signalled Lanes (pcuHr):	23.10	Cycle Time (s): 90
	PRC Over All Lanes (%):	14.9	Total Delay Over All Lanes(pcuHr):	45.11	

Table 5b: Junction 5 (PM)

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: A473 A48 Waterton Rbt	-	-	-		-	-	-	-	-	-	**84.3%**	**0**	**0**	**0**	**43.1**	-	-
A473 A48 Waterton Rbt	-	-	-		-	-	-	-	-	-	**84.3%**	**0**	**0**	**0**	**43.1**	-	-
1/1	Ahead Left	U	C1:A		1	28	-	504	1930	622	81.0%	-	-	-	6.0	42.7	13.5
1/2	Ahead	U	C1:A		1	28	-	136	2080	670	20.3%	-	-	-	1.0	25.5	2.6
2/1	Ahead	U	C1:D		2	35	-	547	1830	752	72.7%	-	-	-	2.1	13.8	4.1
2/2	Ahead	U	C1:D		2	35	-	140	1962	807	17.4%	-	-	-	0.2	5.5	0.4
3/1	Ahead	U	-		-	-	-	336	1911	1911	17.6%	-	-	-	0.1	1.1	0.1
3/2	Ahead Ahead2	U	-		-	-	-	624	2039	2039	30.6%	-	-	-	0.2	1.3	0.2
3/3	Ahead	U	-		-	-	-	382	1990	1990	19.2%	-	-	-	0.1	1.1	0.1
4/1	Ahead	U	C1:C		1	23	-	413	1838	490	84.3%	-	-	-	6.1	53.1	12.3
4/2	Ahead	U	C1:C		1	23	-	242	1971	526	46.0%	-	-	-	2.3	33.9	5.5
5/1		U	-		-	-	-	187	1940	1940	9.6%	-	-	-	0.1	1.0	0.1
5/2		U	-		-	-	-	369	2080	2080	17.7%	-	-	-	0.1	1.1	0.1
6/1	Left Ahead	U	-		-	-	-	620	1850	1850	33.5%	-	-	-	0.3	1.5	0.3
6/2	Left Ahead	U	-		-	-	-	948	1996	1996	47.5%	-	-	-	0.5	1.7	0.5
7/1		U	-		-	-	-	336	1940	1940	17.3%	-	-	-	0.1	1.1	0.1
7/2		U	-		-	-	-	523	2080	2080	25.1%	-	-	-	0.2	1.2	0.2
8/2+8/3	Right Ahead	U	-		-	-	-	933	2041:1860	1271+702	47.3 : 47.3%	-	-	-	0.5	1.8	12.2
9/1	Left	U	C2:A		1	36	-	519	1838	756	68.7%	-	-	-	4.2	29.3	11.6
9/2	Left	U	C2:A		1	36	-	566	1971	810	69.9%	-	-	-	4.6	29.2	12.8
10/1		U	-		-	-	-	47	1940	1940	2.4%	-	-	-	0.0	1.0	0.0
10/2		U	-		-	-	-	374	2080	2080	18.0%	-	-	-	0.1	1.1	0.1
11/1		U	-		-	-	-	749	1940	1940	38.6%	-	-	-	0.3	1.5	0.3
11/2		U	-		-	-	-	330	2080	2080	15.9%	-	-	-	0.1	1.0	0.1
12/1	Ahead	U	C2:C		1	16	-	250	1940	366	68.2%	-	-	-	3.4	49.2	6.8
12/2	Ahead	U	C2:C		1	16	-	275	2080	393	70.0%	-	-	-	3.8	49.1	7.6
13/1	Right	U	C1:B		1	38	-	101	1848	801	12.6%	-	-	-	0.2	7.0	0.8
13/2	Right	U	C2:B		1	31	-	382	1981	704	54.2%	-	-	-	1.5	14.1	4.5
14/1	Right	U	C2:D		2	43	-	573	1940	970	59.1%	-	-	-	1.2	7.8	3.6
14/2	Right	U	C2:D		2	43	-	574	2080	1040	55.2%	-	-	-	1.0	6.2	2.3
15/1	Right Ahead	U	C1:B		1	38	-	271	1916	830	32.6%	-	-	-	1.0	13.5	3.2
15/2	Right Ahead	U	C1:B		1	38	-	332	2079	901	36.9%	-	-	-	1.4	15.3	5.1
19/1	Ahead	U	C1:I		1	75	-	749	1940	1638	45.7%	-	-	-	0.4	2.1	0.8
19/2	Ahead	U	C1:I		1	75	-	330	1940	1638	20.1%	-	-	-	0.1	1.4	0.2
Ped Link: P1	Unnamed Ped Link	-	C1:E		1	27	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P2	Unnamed Ped Link	-	C1:J		1	7	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P3	Unnamed Ped Link	-	C1:F		1	30	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P4	Unnamed Ped Link	-	C1:H		1	27	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P5	Unnamed Ped Link	-	C1:G		1	30	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P6	Unnamed Ped Link	-	C2:F		1	38	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P7	Unnamed Ped Link	-	C2:E		1	19	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P8	Unnamed Ped Link	-	C2:H		1	19	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P9	Unnamed Ped Link	-	C2:G		1	38	-	0	-	0	0.0%	-	-	-	-	-	-

C1 - West	Stream: 1 PRC for Signalled Lanes (%):	6.8	Total Delay for Signalled Lanes (pcuHr):	20.25	Cycle Time (s): 90
C1 - West	Stream: 2 PRC for Signalled Lanes (%):	96.8	Total Delay for Signalled Lanes (pcuHr):	0.58	Cycle Time (s): 90
C2 - East	Stream: 1 PRC for Signalled Lanes (%):	28.6	Total Delay for Signalled Lanes (pcuHr):	19.71	Cycle Time (s): 90
	PRC Over All Lanes (%):	6.8	Total Delay Over All Lanes(pcuHr):	43.13	

Junction 6, LINSIG

Table 6a: Junction 6 (AM)

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	-	-	-		-	-	-	-	-	-	**104.6%**	**716**	**0**	**0**	**116.6**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**104.6%**	**716**	**0**	**0**	**116.6**	-	-
1/1	Left	U	C2:C		1	26	-	467	1805	542	86.2%	-	-	-	6.8	52.2	13.8
1/2	Left	U	C2:C		1	26	-	497	1935	581	85.6%	-	-	-	6.9	49.9	14.4
2/1		U	-		-	-	-	551	1940	1940	28.0%	-	-	-	0.2	1.3	0.2
2/2		U	-		-	-	-	892	2080	2080	42.9%	-	-	-	0.4	1.5	0.4
3/2+3/1	Ahead	U	C1:A		1	50	-	962	2046:1908	921+293	79.3 : 79.3%	-	-	-	5.6	20.8	18.1
3/3	Ahead	U	C1:A		1	50	-	758	2046	1159	65.4%	-	-	-	3.8	17.9	13.8
4/1	Ahead Ahead2	U	-		-	-	-	953	1891	1891	50.0%	-	-	-	0.5	1.9	4.2
4/2	Ahead Ahead2	U	-		-	-	-	1145	2024	2024	56.6%	-	-	-	0.7	2.0	2.3
5/1	Right	U	C1:B		1	24	-	402	1883	523	76.9%	-	-	-	3.5	31.2	10.7
5/2	Right	U	C1:B		1	24	-	253	2019	561	45.1%	-	-	-	0.9	12.5	2.9
6/1	Ahead Left	U	-		-	-	-	634	1899	1899	33.4%	-	-	-	0.3	1.4	0.3
6/2	Ahead	U	-		-	-	-	867	2039	2039	42.5%	-	-	-	0.4	1.5	0.4
6/3	Ahead	U	-		-	-	-	874	2039	2039	42.9%	-	-	-	0.4	1.5	7.8
7/1	Ahead	U	C2:D		1	43	-	171	1940	948	18.0%	-	-	-	0.6	11.8	4.3
7/2	Ahead	U	C2:D		1	43	-	867	2080	1017	85.3%	-	-	-	5.4	22.5	11.0
7/3	Ahead	U	C2:D		1	43	-	874	2080	1017	85.9%	-	-	-	5.5	22.5	10.2
8/1+8/2		U	-		-	-	-	463	1940:1940	1940+0	23.9 : 0.0%	-	-	-	0.2	1.2	0.2
9/1	Ahead	U	C2:D		1	43	-	62	1830	895	6.9%	-	-	-	0.2	14.4	0.8
9/2	Ahead	U	C2:D		1	43	-	372	1830	895	41.6%	-	-	-	1.9	18.2	6.2
10/1	Ahead	U	-		-	-	-	233	1940	1940	12.0%	-	-	-	0.1	1.4	4.5
10/2	Ahead Right	U	-		-	-	-	1239	2051	2051	60.4%	-	-	-	3.5	10.2	31.2

10/3	Ahead Right	U	-		-	-	-	874	2080	2080	42.0%	-	-	-	0.4	1.5	0.4
11/1		U	-		-	-	-	233	1940	1940	12.0%	-	-	-	0.1	1.1	0.1
11/2		U	-		-	-	-	126	1940	1940	6.5%	-	-	-	0.0	1.0	0.0
11/3		U	-		-	-	-	874	2080	2080	42.0%	-	-	-	0.4	1.5	0.4
12/1	Ahead Right	U	C2:B		1	49	-	1113	1915	1064	104.6%	-	-	-	37.9	122.6	62.0
12/2	Right	U	C2:B		1	49	-	0	2080	1156	0.0%	-	-	-	0.0	0.0	0.0
13/1	Left Ahead	U	C2:A		1	20	-	439	1940	453	97.0%	-	-	-	11.8	96.5	18.5
13/2	Ahead	U	C2:A		1	20	-	439	1940	453	97.0%	-	-	-	11.8	96.5	18.5
14/1		U	-		-	-	-	490	1940	1940	24.2%	-	-	-	0.2	1.2	0.2
15/1+15/2	Ahead	O	-		-	-	-	358	1870:2005	263+369	56.6 : 56.6%	716	0	0	1.3	13.3	3.4
16/1	Right	U	-		-	-	-	1062	1940	1940	53.3%	-	-	-	0.6	2.0	0.6
16/2	Right	U	-		-	-	-	439	2080	2080	21.1%	-	-	-	0.1	1.1	0.1
17/1		U	-		-	-	-	188	1940	1940	9.4%	-	-	-	0.1	1.0	0.1
17/2		U	-		-	-	-	537	2080	2080	25.1%	-	-	-	0.2	1.2	0.2
18/1	Left	U	-		-	-	-	188	1848	1848	9.8%	-	-	-	0.1	1.1	0.1
18/2	Left Ahead	U	-		-	-	-	1023	1996	1996	50.1%	-	-	-	0.5	1.8	0.5
18/3	Ahead	U	-		-	-	-	648	2013	2013	32.2%	-	-	-	0.2	1.3	0.2
19/1	Ahead	U	C2:D		1	43	-	486	1911	934	51.2%	-	-	-	2.2	16.9	6.9
19/2	Ahead	U	C2:D		1	43	-	648	2049	1002	64.7%	-	-	-	1.5	8.2	4.5
Ped Link: P1	Unnamed Ped Link	-	C2:F		1	20	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P2	Unnamed Ped Link	-	C2:E		1	28	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P3	Unnamed Ped Link	-	C1:H		1	28	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P4	Unnamed Ped Link	-	C1:G		1	52	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P5	Unnamed Ped Link	-	C1:F		1	52	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P6	Unnamed Ped Link	-	C1:E		1	28	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P7	Unnamed Ped Link	-	C2:H		1	26	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P8	Unnamed Ped Link	-	C2:G		1	26	-	0	-	0	0.0%	-	-	-	-	-	-

C1 - South Controller	Stream: 1 PRC for Signalled Lanes (%):	13.5	Total Delay for Signalled Lanes (pcuHr):	13.69	Cycle Time (s): 90
C2 - North Controller	Stream: 1 PRC for Signalled Lanes (%):	-16.2	Total Delay for Signalled Lanes (pcuHr):	61.44	Cycle Time (s): 90
C2 - North Controller	Stream: 2 PRC for Signalled Lanes (%):	4.4	Total Delay for Signalled Lanes (pcuHr):	30.95	Cycle Time (s): 90
	PRC Over All Lanes (%):	-16.2	Total Delay Over All Lanes(pcuHr):	116.59	

Table 6b: Junction 6 (PM)

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	-	-	-		-	-	-	-	-	-	**106.9%**	**1074**	**0**	**0**	**122.0**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**106.9%**	**1074**	**0**	**0**	**122.0**	-	-
1/1	Left	U	C2:C		1	20	-	340	1805	421	80.7%	-	-	-	5.1	53.7	10.0
1/2	Left	U	C2:C		1	20	-	371	1935	452	82.2%	-	-	-	5.6	53.9	10.9
2/1		U	-		-	-	-	628	1940	1940	32.1%	-	-	-	0.2	1.4	0.2
2/2		U	-		-	-	-	842	2080	2080	39.6%	-	-	-	0.3	1.4	0.3
3/2+3/1	Ahead	U	C1:A		1	55	-	934	2046:1908	805+616	65.7 : 65.7%	-	-	-	3.2	12.2	8.9
3/3	Ahead	U	C1:A		1	55	-	485	2046	1273	38.1%	-	-	-	1.4	10.7	6.2
4/1	Ahead Ahead2	U	-		-	-	-	911	1889	1889	48.0%	-	-	-	0.5	1.8	6.8
4/2	Ahead Ahead2	U	-		-	-	-	1100	2024	2024	53.5%	-	-	-	0.6	1.9	0.6
5/1	Right	U	C1:B		1	19	-	283	1883	418	67.6%	-	-	-	3.4	43.2	7.0
5/2	Right	U	C1:B		1	19	-	258	2019	449	57.5%	-	-	-	2.5	34.4	6.6
6/1	Ahead Left	U	-		-	-	-	688	1900	1900	36.2%	-	-	-	0.3	1.5	0.3
6/2	Ahead	U	-		-	-	-	550	2039	2039	27.0%	-	-	-	0.2	1.2	0.2
6/3	Ahead	U	-		-	-	-	722	2039	2039	35.4%	-	-	-	0.3	1.4	0.3
7/1	Ahead	U	C2:D		1	49	-	318	1940	1078	29.5%	-	-	-	0.9	10.5	3.1
7/2	Ahead	U	C2:D		1	49	-	550	2080	1156	47.6%	-	-	-	2.3	14.8	7.0
7/3	Ahead	U	C2:D		1	49	-	722	2080	1156	62.5%	-	-	-	2.4	11.9	6.8
8/1+8/2		U	-		-	-	-	370	1940:1940	1940+0	19.1 : 0.0%	-	-	-	0.1	1.1	0.1
9/1	Ahead	U	C2:D		1	49	-	111	1830	1017	10.9%	-	-	-	0.4	11.5	1.4
9/2	Ahead	U	C2:D		1	49	-	539	1830	1017	53.0%	-	-	-	2.4	16.4	8.9
10/1	Ahead	U	-		-	-	-	429	1940	1940	22.1%	-	-	-	0.2	1.5	3.8
10/2	Ahead Right	U	-		-	-	-	1089	2048	2048	53.2%	-	-	-	1.6	5.4	17.4

10/3	Ahead Right	U	-		-	-	-	722	2080	2080	34.7%	-	-	-	0.3	1.3	0.3
11/1		U	-		-	-	-	429	1940	1940	22.1%	-	-	-	0.1	1.2	0.1
11/2		U	-		-	-	-	16	1940	1940	0.8%	-	-	-	0.0	0.9	0.0
11/3		U	-		-	-	-	722	2080	2080	34.7%	-	-	-	0.3	1.3	0.3
12/1	Ahead Right	U	C2:B		1	48	-	1073	1906	1038	103.4%	-	-	-	33.5	112.4	56.0
12/2	Right	U	C2:B		1	48	-	0	2080	1132	0.0%	-	-	-	0.0	0.0	0.0
13/1	Left Ahead	U	C2:A		1	21	-	443	1940	474	93.4%	-	-	-	9.4	76.3	16.1
13/2	Ahead	U	C2:A		1	21	-	453	1940	474	95.5%	-	-	-	10.8	85.9	17.7
14/1		U	-		-	-	-	210	1940	1940	10.4%	-	-	-	0.1	1.0	0.1
15/1+15/2	Ahead	O	-		-	-	-	555	1870:2005	261+258	106.9 : 106.9%	1074	0	0	27.9	181.3	42.5
16/1	Right	U	-		-	-	-	1306	1940	1940	65.9%	-	-	-	1.0	2.7	1.0
16/2	Right	U	-		-	-	-	453	2080	2080	21.8%	-	-	-	0.1	1.1	0.1
17/1		U	-		-	-	-	402	1940	1940	20.3%	-	-	-	0.1	1.2	0.1
17/2		U	-		-	-	-	612	2080	2080	28.8%	-	-	-	0.2	1.2	0.2
18/1	Left	U	-		-	-	-	402	1848	1848	21.3%	-	-	-	0.1	1.2	0.1
18/2	Left Ahead	U	-		-	-	-	1183	1996	1996	58.4%	-	-	-	0.7	2.2	0.7
18/3	Ahead	U	-		-	-	-	729	2013	2013	35.3%	-	-	-	0.3	1.4	1.4
19/1	Ahead	U	C2:D		1	49	-	571	1911	1062	53.4%	-	-	-	2.5	15.9	9.7
19/2	Ahead	U	C2:D		1	49	-	729	2049	1138	62.5%	-	-	-	0.9	4.4	3.1
Ped Link: P1	Unnamed Ped Link	-	C2:F		1	21	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P2	Unnamed Ped Link	-	C2:E		1	28	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P3	Unnamed Ped Link	-	C1:H		1	23	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P4	Unnamed Ped Link	-	C1:G		1	57	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P5	Unnamed Ped Link	-	C1:F		1	57	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P6	Unnamed Ped Link	-	C1:E		1	23	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P7	Unnamed Ped Link	-	C2:H		1	20	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P8	Unnamed Ped Link	-	C2:G		1	29	-	0	-	0	0.0%	-	-	-	-	-	-

C1 - South Controller	Stream: 1 PRC for Signalled Lanes (%):	33.1	Total Delay for Signalled Lanes (pcuHr):	10.47	Cycle Time (s): 90
C2 - North Controller	Stream: 1 PRC for Signalled Lanes (%):	-14.9	Total Delay for Signalled Lanes (pcuHr):	53.70	Cycle Time (s): 90
C2 - North Controller	Stream: 2 PRC for Signalled Lanes (%):	9.5	Total Delay for Signalled Lanes (pcuHr):	22.37	Cycle Time (s): 90
	PRC Over All Lanes (%):	-18.8	Total Delay Over All Lanes(pcuHr):	122.04	

Junction 7, Arcady 9 – Roundabout Module

Table 7: Summary of Junction Performance, Junction 7

	AM								PM							
	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity
	2020															
Arm B	0.6	2.9	4.38	0.38	A	2.90	A	40 % [Arm C]	0.2	0.5	2.94	0.19	A	2.45	A	64 % [Arm E]
Arm C	1.0	2.1	5.15	0.51	A				0.7	2.8	3.47	0.41	A			
Arm D	0.3	1.3	1.70	0.26	A				0.7	2.8	2.07	0.40	A			
Arm E	0.2	0.5	3.99	0.16	A				0.3	1.2	5.10	0.22	A			
Arm A	0.7	2.8	1.73	0.41	A				0.6	2.6	1.65	0.36	A			

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 8, LINSIG

Table 8a: Junction 8 (AM)

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	-	-	-		-	-	-	-	-	-	**127.9%**	**0**	**0**	**0**	**144.7**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**127.9%**	**0**	**0**	**0**	**144.7**	-	-
1/1	Right Ahead	U	A		1	9	-	443	1940	346	127.9%	-	-	-	56.0	454.7	58.9
1/2	Right Right2	U	A		1	9	-	475	2080	371	127.9%	-	-	-	59.9	453.6	63.0
2/1		U	-		-	-	-	176	1940	1940	9.1%	-	-	-	0.0	1.0	0.0
2/2		U	-		-	-	-	534	2080	2080	25.7%	-	-	-	0.2	1.2	0.2
3/1	Left	U	C		1	7	-	155	1732	247	62.6%	-	-	-	1.8	41.7	3.1
3/2	Ahead	U	C		1	7	-	132	1940	277	47.6%	-	-	-	1.3	34.4	2.3
3/3	Ahead	U	C		1	7	-	144	2080	297	48.5%	-	-	-	1.4	33.8	2.5
4/2+4/1		U	-		-	-	-	691	1940:1940	1940	32.2%	-	-	-	0.2	1.4	0.2
5/1		U	-		-	-	-	429	1940	1940	20.6%	-	-	-	0.1	1.2	0.1
5/2		U	-		-	-	-	702	2080	2080	28.9%	-	-	-	0.2	1.2	0.2
6/1	Left Ahead	U	B		1	12	-	369	1890	439	84.1%	-	-	-	4.6	44.6	7.9
6/2	Ahead	U	B		1	12	-	378	1940	450	83.9%	-	-	-	4.6	43.8	8.0
6/3+6/4	Ahead	U	B		1	12	-	405	2080:2080	662	61.2%	-	-	-	2.8	25.3	3.9
7/2+7/1	Left	U	D		1	11	-	403	1935:1805	658	61.2%	-	-	-	3.0	26.4	3.7
8/1		U	-		-	-	-	372	1940	1940	19.0%	-	-	-	0.1	1.1	0.1
9/1	Ahead	U	E		1	17	-	413	1940	624	61.4%	-	-	-	2.8	26.3	5.5
9/2	Ahead	U	E		1	17	-	563	2080	669	69.3%	-	-	-	2.5	19.3	4.2
10/1	Ahead Right	U	-		-	-	-	132	1935	1935	6.8%	-	-	-	0.0	1.0	0.0
10/2	Right	U	-		-	-	-	144	1972	1972	7.3%	-	-	-	0.0	1.0	0.0
11/1	Ahead	U	-		-	-	-	176	1940	1940	9.1%	-	-	-	0.0	1.0	0.0
11/2	Ahead	U	-		-	-	-	534	2080	2080	25.7%	-	-	-	0.2	1.2	0.2
11/3	Right	U	-		-	-	-	387	1935	1935	20.0%	-	-	-	0.1	1.2	1.8
11/4	Right	U	-		-	-	-	379	1935	1935	19.6%	-	-	-	0.1	1.2	0.7
12/1	Right	U	H		1	34	-	387	1911	1194	32.4%	-	-	-	1.1	10.5	4.2
12/2	Right Right2	U	H		1	34	-	379	1995	1247	30.4%	-	-	-	0.9	8.7	3.3
13/1	Right	U	G		1	14	-	17	1856	497	2.7%	-	-	-	0.1	30.5	0.2
14/1	Ahead	U	O		1	47	-	691	1830	1569	39.8%	-	-	-	0.3	1.9	2.4
15/1	Ahead	U	M		1	47	-	176	1940	1663	10.6%	-	-	-	0.1	1.2	0.1
15/2	Ahead	U	M		1	47	-	534	2080	1783	30.0%	-	-	-	0.2	1.5	0.2

C1	Stream: 1 PRC for Signalled Lanes (%):	-42.1	Total Delay for Signalled Lanes (pcuHr):	142.63	Cycle Time (s):	56
C1	Stream: 2 PRC for Signalled Lanes (%):	200.5	Total Delay for Signalled Lanes (pcuHr):	0.28	Cycle Time (s):	56
C1	Stream: 3 PRC for Signalled Lanes (%):	126.0	Total Delay for Signalled Lanes (pcuHr):	0.33	Cycle Time (s):	56
C1	Stream: 4 PRC for Signalled Lanes (%):	0.0	Total Delay for Signalled Lanes (pcuHr):	0.00	Cycle Time (s):	56
	PRC Over All Lanes (%):	-42.1	Total Delay Over All Lanes(pcuHr):	144.70		

Table 8b: Junction 8 (PM)

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	-	-	-		-	-	-	-	-	-	75.2%	0	0	0	35.3	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	75.2%	0	0	0	35.3	-	-
1/1	Right Ahead	U	A		1	16	-	341	1940	507	67.2%	-	-	-	3.0	32.2	6.5
1/2	Right Right2	U	A		1	16	-	353	2080	544	64.9%	-	-	-	3.0	30.7	6.5
2/1		U	-		-	-	-	196	1940	1940	10.1%	-	-	-	0.1	1.0	0.1
2/2		U	-		-	-	-	590	2080	2080	28.4%	-	-	-	0.2	1.2	0.2
3/1	Left	U	C		1	9	-	196	1732	266	73.6%	-	-	-	2.8	50.8	4.7
3/2	Ahead	U	C		1	9	-	179	1940	298	60.0%	-	-	-	2.0	40.5	3.7
3/3	Ahead	U	C		1	9	-	196	2080	320	61.3%	-	-	-	2.2	40.0	4.0
4/2+4/1		U	-		-	-	-	427	1940:1940	1940	22.0%	-	-	-	0.1	1.2	0.1
5/1		U	-		-	-	-	456	1940	1940	23.5%	-	-	-	0.2	1.2	0.2
5/2		U	-		-	-	-	712	2080	2080	34.2%	-	-	-	0.3	1.3	0.3
6/1	Left Ahead	U	B		1	19	-	374	1890	582	64.3%	-	-	-	2.9	28.0	6.7
6/2	Ahead	U	B		1	19	-	375	1940	597	62.8%	-	-	-	2.9	27.4	6.6
6/3+6/4	Ahead	U	B		1	19	-	393	2080:2080	752	52.2%	-	-	-	2.4	22.4	4.2
7/2+7/1	Left	U	D		1	11	-	368	1935:1805	489	75.2%	-	-	-	4.0	38.7	5.4
8/1		U	-		-	-	-	394	1940	1940	20.3%	-	-	-	0.1	1.2	0.1
9/1	Ahead	U	E		1	24	-	428	1940	746	57.4%	-	-	-	2.6	22.2	5.9
9/2	Ahead	U	E		1	24	-	544	2080	800	68.0%	-	-	-	2.3	15.2	5.0
10/1	Ahead Right	U	-		-	-	-	179	1919	1919	9.3%	-	-	-	0.1	1.0	0.1
10/2	Right	U	-		-	-	-	196	1972	1972	9.9%	-	-	-	0.1	1.0	0.6
11/1	Ahead	U	-		-	-	-	196	1940	1940	10.1%	-	-	-	0.1	1.0	0.1
11/2	Ahead	U	-		-	-	-	590	2080	2080	28.4%	-	-	-	0.2	1.2	0.2
11/3	Right	U	-		-	-	-	229	1935	1935	11.8%	-	-	-	0.1	1.1	0.1
11/4	Right	U	-		-	-	-	496	1935	1935	25.6%	-	-	-	0.2	1.3	2.4
12/1	Right	U	H		1	36	-	229	1911	1088	21.1%	-	-	-	0.8	13.2	2.7
12/2	Right Right2	U	H		1	36	-	496	1994	1135	43.7%	-	-	-	2.1	15.2	5.9
13/1	Right	U	G		1	14	-	20	1856	428	4.7%	-	-	-	0.2	36.1	0.3
14/1	Ahead	U	O		1	56	-	427	1830	1605	26.6%	-	-	-	0.2	1.5	0.7
15/1	Ahead	U	M		1	56	-	196	1940	1701	11.5%	-	-	-	0.1	1.2	0.1
15/2	Ahead	U	M		1	56	-	590	2080	1824	32.3%	-	-	-	0.2	1.5	0.2

C1 Stream: 1 PRC for Signalled Lanes (%): 19.6 Total Delay for Signalled Lanes (pcuHr): 33.25 Cycle Time (s): 65
C1 Stream: 2 PRC for Signalled Lanes (%): 178.2 Total Delay for Signalled Lanes (pcuHr): 0.31 Cycle Time (s): 65
C1 Stream: 3 PRC for Signalled Lanes (%): 238.2 Total Delay for Signalled Lanes (pcuHr): 0.18 Cycle Time (s): 65
C1 Stream: 4 PRC for Signalled Lanes (%): 0.0 Total Delay for Signalled Lanes (pcuHr): 0.00 Cycle Time (s): 65
PRC Over All Lanes (%): 19.6 Total Delay Over All Lanes(pcuHr): 35.27

Junction 9, Arcady 9 – Roundabout Module

Table 9: Summary of Junction Performance, Junction 9

	AM									PM								
	Set ID	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity	Set ID	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity
	2020																	
Arm 1	D1	1.1	1.5	3.94	0.53	A	3.80	A	32 % [Arm 3]	D2	1.5	2.3	4.22	0.61	A	3.57	A	46 % [Arm 1]
Arm 2		1.0	1.5	2.54	0.49	A					1.1	1.5	2.88	0.53	A			
Arm 3		1.3	1.5	5.68	0.57	A					0.6	2.7	3.81	0.37	A			

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 10, LINSIG

Table 10a: Junction 10 (AM)

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	-	-	-		-	-	-	-	-	-	**142.2%**	**0**	**110**	**0**	**199.6**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**142.2%**	**0**	**110**	**0**	**199.6**	-	-
1/1	Ahead Left	U	A		1	49	-	847	1923	1068	79.3%	-	-	-	5.6	23.9	18.6
1/2+1/3	Right Ahead	U	A B		1	49:27	-	418	2080:1902	592	70.6%	-	-	-	4.4	37.6	10.4
3/1+3/2	Left Right Ahead	U	E	F	1	24:10	14	927	1746:1948	652	142.2%	-	-	-	161.1	625.7	170.6
5/1	Ahead Left	U	C		1	17	-	368	1854	371	99.2%	-	-	-	12.6	123.2	18.0
5/2	Ahead	U	C		1	17	-	413	2080	416	99.3%	-	-	-	13.6	118.2	19.6
7/1+7/2	Right Ahead	U	D		1	10	-	131	1904:1848	363	36.1%	-	-	-	1.5	41.6	2.0
8/1	Ahead	U	O		1	71	-	144	1940	1552	8.7%	-	-	-	0.1	1.8	0.5
10/1	Left	O	-		-	-	-	110	1764	568	19.4%	0	110	0	0.6	18.4	1.8
11/1	Ahead	U	O		1	71	-	241	1940	1552	15.5%	-	-	-	0.2	3.4	1.4

C1 Stream: 1 PRC for Signalled Lanes (%): -58.0 — Total Delay for Signalled Lanes (pcuHr): 198.77 — Cycle Time (s): 90
C1 Stream: 2 PRC for Signalled Lanes (%): 479.6 — Total Delay for Signalled Lanes (pcuHr): 0.30 — Cycle Time (s): 90
PRC Over All Lanes (%): -58.0 — Total Delay Over All Lanes(pcuHr): 199.63

Table 10b: Junction 10 (PM)

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	-	-	-		-	-	-	-	-	-	**125.1%**	**50**	**92**	**0**	**178.7**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**125.1%**	**50**	**92**	**0**	**178.7**	-	-
1/1	Ahead Left	U	A		1	49	-	609	1923	1068	57.0%	-	-	-	2.9	16.9	10.5
1/2+1/3	Right Ahead	U	A B		1	49:25	-	589	2080:1902	549	107.2%	-	-	-	32.1	196.4	41.9
3/1+3/2	Left Right Ahead	U	E	F	1	22:10	12	749	1746:1946	598	125.1%	-	-	-	90.3	434.0	99.0
5/1	Ahead Left	U	C		1	19	-	431	1829	406	106.0%	-	-	-	23.4	195.6	29.6
5/2	Ahead	U	C		1	19	-	490	2080	462	106.0%	-	-	-	25.9	190.6	33.0
7/1+7/2	Right Ahead	U	D		1	10	-	233	1904:1848	372	62.7%	-	-	-	3.1	47.9	3.2
8/1	Ahead	U	O		1	71	-	99	1940	1552	6.1%	-	-	-	0.1	2.8	0.5
10/1	Left	O	-		-	-	-	142	1764	618	23.0%	50	92	0	0.5	12.9	2.2
11/1	Ahead	U	O		1	71	-	375	1940	1552	24.2%	-	-	-	0.4	3.8	2.5

C1 Stream: 1 PRC for Signalled Lanes (%): -39.1 — Total Delay for Signalled Lanes (pcuHr): 177.76 — Cycle Time (s): 90
C1 Stream: 2 PRC for Signalled Lanes (%): 272.5 — Total Delay for Signalled Lanes (pcuHr): 0.47 — Cycle Time (s): 90
PRC Over All Lanes (%): -39.1 — Total Delay Over All Lanes(pcuHr): 178.74

Junction 11, PICADY 9 – Priority Intersection Module

Table 11: Summary of Junction Performance, Junction 11

	AM									PM							
	Set ID	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity	Set ID	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Networ Residu Capaci
	2020																	
Stream B-AC	D1	0.2	1.0	11.22	0.19	B	1.49	A	27 % [Stream C-AB]	D2	0.4	1.6	12.84	0.29	B	1.18	A	26 % [Strea B-AC]
Stream C-AB		1.7	5.6	5.06	0.40	A					0.9	3.3	4.67	0.24	A			

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 12, PICADY 9 – Priority Intersection Module

Table 12: Summary of Junction Performance, Junction 12

	AM					PM				
	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020									
Stream B-ACD	0.0	0.00	0.00	A	21 % [Stream D-ABC]	0.0	0.00	0.00	A	7 % [Stream A-BCD]
Stream A-BCD	1.9	8.27	0.50	A		5.7	11.64	0.73	B	
Stream D-ABC	1.2	18.01	0.56	C		0.5	11.67	0.32	B	
Stream C-ABD	0.0	0.00	0.00	A		0.0	0.00	0.00	A	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 13, PICADY 9 – Priority Intersection Module

Table 13: Summary of Junction Performance, Junction 13

	AM					PM				
	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020									
Stream B-AC	3.4	34.70	0.79	D	0 % [Stream B-AC]	1.2	18.54	0.56	C	-16 % [Stream C-AB]
Stream C-AB	1.6	9.88	0.52	A		61.8	206.63	1.11	F	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 14. ARCADY 9 – Roundabout Module

Table 14: Summary of Junction Performance, Junction 14

	AM						PM					
	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020											
Arm 1	D1	3.5	6.17	0.78	A	24 % [Arm 1]	D2	1.6	3.65	0.62	A	-4 % [Arm 4]
Arm 2		0.2	1.65	0.15	A			2.2	4.44	0.69	A	
Arm 3		0.0	2.33	0.02	A			0.3	5.00	0.21	A	
Arm 4		0.2	3.87	0.20	A			6.6	59.96	0.90	F	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 15. ARCADY 9 – Roundabout Module

Table 15: Summary of Junction Performance, Junction 15

	AM					PM				
	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020									
Arm 1	0.8	2.85	0.44	A	0 % [Arm 4]	0.9	2.76	0.48	A	29 % [Arm 4]
Arm 2	0.7	4.72	0.41	A		0.9	5.54	0.47	A	
Arm 3	0.2	4.68	0.15	A		0.1	4.98	0.09	A	
Arm 4	17.8	32.56	0.96	D		2.9	6.29	0.75	A	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 16, LINSIG

Table 16a: Junction 16 (AM)

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	-	-	-		-	-	-	-	-	-	**191.8%**	**0**	**0**	**0**	**214.3**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**191.8%**	**0**	**0**	**0**	**214.3**	-	-
1/1	Left Ahead Right	U	E		1	11	-	479	1873	250	191.8%	-	-	-	130.9	984.0	135.6
2/1		U	-		-	-	-	474	1940	1940	22.1%	-	-	-	0.1	1.2	0.1
4/1+4/2	Right Left Ahead	U	C D		1	17:12	-	460	1884:1891	438	105.1%	-	-	-	23.1	180.7	28.0
6/2+6/1	Ahead Right Left	U	F		1	21	-	608	2040:1687	527	115.4%	-	-	-	53.6	317.6	61.4
8/1+8/2	Left Ahead Right	U	A B		1	17:12	-	426	1906:1920	511	83.4%	-	-	-	6.5	54.8	10.0
			C1		PRC for Signalled Lanes (%): -113.1 PRC Over All Lanes (%): -113.1				Total Delay for Signalled Lanes (pcuHr): 214.15 Total Delay Over All Lanes(pcuHr): 214.29			Cycle Time (s): 90					

Table 16b: Junction 16 (PM)

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	-	-	-		-	-	-	-	-	-	**122.3%**	**0**	**0**	**0**	**103.3**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**122.3%**	**0**	**0**	**0**	**103.3**	-	-
1/1	Left Ahead Right	U	E		1	12	-	326	1845	267	122.3%	-	-	-	37.7	415.9	41.9
2/1		U	-		-	-	-	376	1940	1940	18.3%	-	-	-	0.1	1.1	0.1
4/1+4/2	Right Left Ahead	U	C D		1	24:12	-	610	1880:1891	595	102.4%	-	-	-	22.6	133.5	30.2
6/2+6/1	Ahead Right Left	U	F		1	13	-	414	2018:1687	364	113.8%	-	-	-	35.5	308.5	39.6
8/1+8/2	Left Ahead Right	U	A B		1	24:12	-	556	1889:1920	659	84.4%	-	-	-	7.5	48.3	12.9
			C1		PRC for Signalled Lanes (%): -35.9 PRC Over All Lanes (%): -35.9				Total Delay for Signalled Lanes (pcuHr): 103.21 Total Delay Over All Lanes(pcuHr): 103.32			Cycle Time (s): 90					

Junction 17

Table 17a: Junction 17 (AM)

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	-	-	-		-	-	-	-	-	-	**89.8%**	**0**	**0**	**0**	**29.5**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**89.8%**	**0**	**0**	**0**	**29.5**	-	-
1/1	Ahead Left	U	A		1	38	-	307	1834	795	38.6%	-	-	-	1.8	21.0	5.5
1/2	Ahead	U	A		1	38	-	369	2080	901	40.9%	-	-	-	2.1	20.9	6.6
1/3	Right	U	B		1	19	-	101	1981	440	22.9%	-	-	-	1.0	34.0	2.2
2/1	Ahead Left	U	E		1	16	-	302	1860	351	86.0%	-	-	-	5.7	68.2	10.1
2/2	Right	U	E		1	16	-	169	1857	351	48.2%	-	-	-	2.0	42.4	4.2
3/1	Left Ahead	U	C		1	36	-	709	1921	790	89.8%	-	-	-	8.9	45.0	20.5
3/2	Right	U	D		1	19	-	394	1995	443	88.9%	-	-	-	7.2	65.9	13.0
4/1		U	-		-	-	-	256	1940	1940	13.2%	-	-	-	0.1	1.1	0.1
5/1		U	-		-	-	-	809	1940	1940	41.7%	-	-	-	0.4	1.6	0.4
6/1		U	-		-	-	-	211	1940	1940	10.9%	-	-	-	0.1	1.0	0.1
6/2		U	-		-	-	-	503	2080	2080	24.2%	-	-	-	0.2	1.1	0.2
7/1		U	-		-	-	-	572	1940	1940	29.5%	-	-	-	0.2	1.3	0.2
			C1		PRC for Signalled Lanes (%): 0.2 PRC Over All Lanes (%): 0.2				Total Delay for Signalled Lanes (pcuHr): 28.68 Total Delay Over All Lanes(pcuHr): 29.55			Cycle Time (s): 90					

Table 17b: Junction 17 (PM)

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	-	-	-		-	-	-	-	-	-	**76.2%**	**0**	**0**	**0**	**20.4**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**76.2%**	**0**	**0**	**0**	**20.4**	-	-
1/1	Ahead Left	U	A		1	42	-	418	1891	903	46.3%	-	-	-	2.3	19.5	7.4
1/2	Ahead	U	A		1	42	-	477	2080	994	48.0%	-	-	-	2.6	19.4	8.4
1/3	Right	U	B		1	17	-	75	1981	396	18.9%	-	-	-	0.7	35.6	1.7
2/1	Ahead Left	U	E		1	14	-	233	1858	310	75.2%	-	-	-	3.8	58.4	7.0
2/2	Right	U	E		1	14	-	115	1857	309	37.2%	-	-	-	1.4	42.5	2.8
3/1	Left Ahead	U	C		1	40	-	611	1919	874	69.9%	-	-	-	4.5	26.4	13.2
3/2	Right	U	D		1	17	-	304	1995	399	76.2%	-	-	-	4.4	52.3	8.6
4/1		U	-		-	-	-	204	1940	1940	10.5%	-	-	-	0.1	1.0	0.1
5/1		U	-		-	-	-	659	1940	1940	34.0%	-	-	-	0.3	1.4	0.3
6/1		U	-		-	-	-	368	1940	1940	19.0%	-	-	-	0.1	1.1	0.1
6/2		U	-		-	-	-	590	2080	2080	28.4%	-	-	-	0.2	1.2	0.2
7/1		U	-		-	-	-	412	1940	1940	21.2%	-	-	-	0.1	1.2	0.1

C1 PRC for Signalled Lanes (%): 18.1 Total Delay for Signalled Lanes (pcuHr): 19.60 Cycle Time (s): 90
PRC Over All Lanes (%): 18.1 Total Delay Over All Lanes(pcuHr): 20.36

Junction 18. ARCADY 9 – Roundabout Module

Table 18: Summary of Junction Performance, Junction 18

	AM					PM				
	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020									
Arm 1	11.2	59.41	0.95	F	-19 %	1.0	7.83	0.51	A	-14 %
Arm 2	0.8	4.47	0.45	A		5.9	16.44	0.86	C	
Arm 3	58.1	209.09	1.11	F	[Arm 3]	30.5	158.82	1.07	F	[Arm 3]

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 19. ARCADY 9 – Roundabout Module

Table 19: Summary of Junction Performance, Junction 19

	AM					PM				
	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020									
Arm 1	0.0	0.00	0.00	A	241 %	0.0	2.26	0.00	A	417 %
Arm 2	0.0	2.88	0.01	A		0.0	0.00	0.00	A	
Arm 3	0.4	2.51	0.28	A	[Arm 3]	0.2	2.09	0.19	A	[Arm 4]
Arm 4	0.3	2.17	0.22	A		0.2	1.98	0.19	A	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 20, PICADY 9 – Priority Intersection Module

Table 20: Summary of Junction Performance, Junction 20

	AM					PM				
	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020									
Stream B-AC	0.6	14.95	0.38	B	40 %	0.3	9.98	0.23	A	94 %
Stream C-AB	0.0	6.95	0.03	A	[Stream B-AC]	0.0	6.17	0.05	A	[Stream B-AC]

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 21. ARCADY 9 – Roundabout Module

Table 21: Summary of Junction Performance, Junction 21

	AM						PM					
	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020											
Arm 1	D1	1.0	3.82	0.51	A	65 %	D2	0.7	3.04	0.42	A	98 %
Arm 2		0.4	2.23	0.29	A			0.4	2.13	0.30	A	
Arm 3		0.6	2.47	0.39	A	[Arm 1]		0.6	2.49	0.39	A	[Arm 1]
Arm 4		0.2	2.30	0.20	A			0.2	2.04	0.14	A	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met

Junction 22, LINSIG

Table 22a: Junction 22 (AM)

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	-	-	-		-	-	-	-	-	-	79.1%	16	115	0	22.6	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	79.1%	16	115	0	22.6	-	-
1/1	Left Ahead	U	B		1	22	-	392	1938	495	79.1%	-	-	-	5.2	48.1	10.9
1/2	Right	U	C		1	22	-	156	1891	483	32.3%	-	-	-	1.4	32.7	3.4
2/1		U	-		-	-	-	499	1940	1940	25.7%	-	-	-	0.2	1.2	0.2
2/2		U	-		-	-	-	390	1940	1940	20.1%	-	-	-	0.1	1.2	0.1
3/2+3/1	Right Left Ahead	U	D M		1	10:38	-	113	2056:1860	374	30.2%	-	-	-	1.1	34.9	1.9
4/1	Ahead	U	N		1	76	-	151	1940	1660	9.1%	-	-	-	0.1	1.2	0.1
5/2+5/1	Ahead Left	U+O	E -		1	23	-	396	1940:1764	541	73.3%	16	115	0	4.1	37.2	9.6
5/3+5/4	Ahead Right	U	E		1	23	-	433	2080:1891	583	74.2%	-	-	-	5.0	41.4	10.8
7/2+7/1	Left Ahead	U	A L		1	8:33	-	325	2080:1774	784	41.5%	-	-	-	2.6	29.1	4.5
7/3	Right	U	A		1	8	-	133	1872	187	71.0%	-	-	-	2.6	71.1	4.4
8/1		U	-		-	-	-	351	1940	1940	18.1%	-	-	-	0.1	1.1	0.1
9/1	Ahead	U	N		1	76	-	113	1940	1660	6.8%	-	-	-	0.1	2.2	0.4
10/1		U	-		-	-	-	151	1940	1940	7.8%	-	-	-	0.0	1.0	0.0

C1 Stream: 1 PRC for Signalled Lanes (%): 13.7 Total Delay for Signalled Lanes (pcuHr): 22.07 Cycle Time (s): 90
C1 Stream: 2 PRC for Signalled Lanes (%): 889.3 Total Delay for Signalled Lanes (pcuHr): 0.12 Cycle Time (s): 90
PRC Over All Lanes (%): 13.7 Total Delay Over All Lanes(pcuHr): 22.64

Table 22b: Junction 22 (PM)

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%**	**31**	**97**	**0**	**27.6**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**91.7%**	**31**	**97**	**0**	**27.6**	-	-
1/1	Left Ahead	U	B		1	32	-	651	1937	710	91.7%	-	-	-	9.7	53.4	20.1
1/2	Right	U	C		1	32	-	186	1891	693	26.8%	-	-	-	1.2	23.6	3.4
2/1		U	-		-	-	-	304	1940	1940	15.7%	-	-	-	0.1	1.1	0.1
2/2		U	-		-	-	-	268	1940	1940	13.8%	-	-	-	0.1	1.1	0.1
3/2+3/1	Right Left Ahead	U	D M		1	10:29	-	185	2057:1860	465	39.8%	-	-	-	1.8	34.7	2.6
4/1	Ahead	U	N		1	76	-	120	1940	1660	7.2%	-	-	-	0.0	1.2	0.0
5/2+5/1	Ahead Left	U+O	E -		1	14	-	297	1940:1764	367	81.0%	31	97	0	4.2	50.4	8.0
5/3+5/4	Ahead Right	U	E		1	14	-	315	2080:1891	387	81.5%	-	-	-	5.2	59.4	9.0
7/2+7/1	Left Ahead	U	A L		1	7:42	-	179	2080:1774	753	23.8%	-	-	-	1.1	22.5	2.0
7/3	Right	U	A		1	7	-	142	1872	166	85.3%	-	-	-	4.0	102.0	5.9
8/1		U	-		-	-	-	399	1940	1940	20.6%	-	-	-	0.1	1.2	0.1
9/1	Ahead	U	N		1	76	-	185	1940	1660	11.1%	-	-	-	0.1	2.3	0.8
10/1		U	-		-	-	-	120	1940	1940	6.2%	-	-	-	0.0	1.0	0.0

C1 Stream: 1 PRC for Signalled Lanes (%): -1.8 Total Delay for Signalled Lanes (pcuHr): 27.15 Cycle Time (s): 90
C1 Stream: 2 PRC for Signalled Lanes (%): 707.5 Total Delay for Signalled Lanes (pcuHr): 0.16 Cycle Time (s): 90
PRC Over All Lanes (%): -1.8 Total Delay Over All Lanes(pcuHr): 27.64

Junction 23. ARCADY 9 – Roundabout Module

Table 23: Summary of Junction Performance, Junction 23

	AM					PM				
	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020									
Arm 1	3.5	10.58	0.78	B	14 %	0.9	4.29	0.48	A	19 %
Arm 2	1.0	3.19	0.50	A		1.0	2.74	0.50	A	
Arm 3	0.9	4.72	0.49	A	[Arm 1]	2.3	8.72	0.70	A	[Arm 3]
Arm 4	0.9	6.97	0.48	A		1.1	9.72	0.52	A	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met

Junction 24. PICADY 9 – Priority Intersection Module

Table 24: Summary of Junction Performance, Junction 24

	AM					PM				
	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020									
Stream B-AC	38.4	464.87	1.59	F	-19 %	4.4	67.32	0.85	F	-7 %
Stream C-AB	121.0	351.09	1.19	F	[Stream C-AB]	15.1	39.47	0.91	E	[Stream B-AC]

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 25. PICADY 9 – Priority Intersection Module

Table 25: Summary of Junction Performance, Junction 25

	AM					PM				
	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020									
Stream B-AC	0.1	7.39	0.09	A	99 %	0.4	10.01	0.27	B	105 %
Stream C-AB	0.6	5.51	0.25	A	[Stream C-AB]	0.2	5.80	0.13	A	[Stream B-AC]

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 26. PICADY 9 – Priority Intersection Module

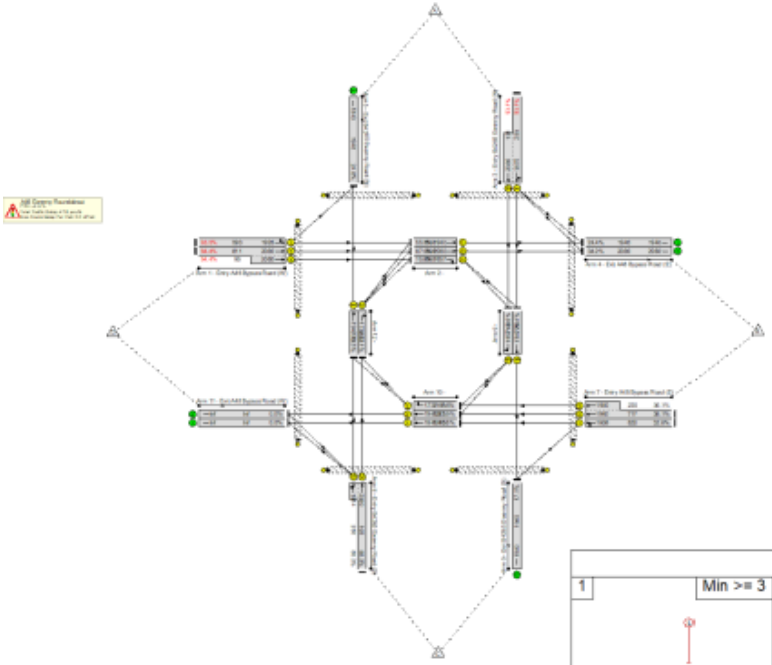
Table 26: Summary of Junction Performance, Junction 26.

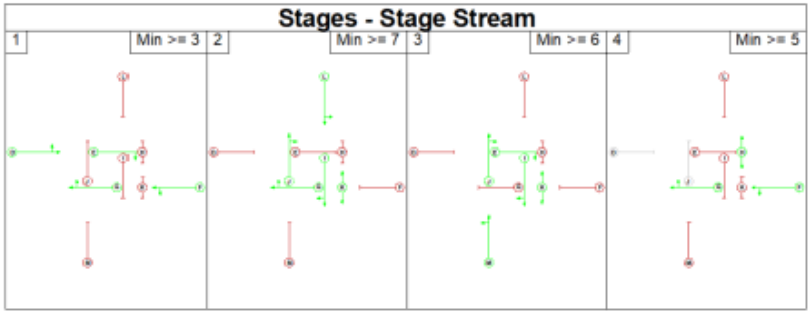
	AM					PM				
	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020									
Stream B-ACD	0.2	8.91	0.17	A	21 %	0.3	10.42	0.22	B	29 %
Stream A-BCD	0.0	4.92	0.02	A		0.1	5.61	0.05	A	
Stream D-AB	0.1	8.68	0.08	A		0.2	9.56	0.13	A	
Stream D-BC	1.3	18.52	0.57	C	[Stream D-BC]	0.9	16.42	0.47	C	[Stream D-BC]
Stream C-ABD	0.2	5.28	0.10	A		0.4	4.48	0.16	A	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Network Diagrams for LINSIG Models of Signalised Junctions

Figure A: Network Layout Diagram, Junction 4





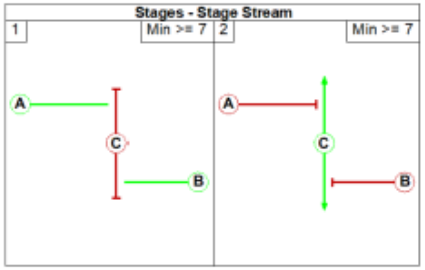


Figure B: Network Layout Diagram, Junction 5

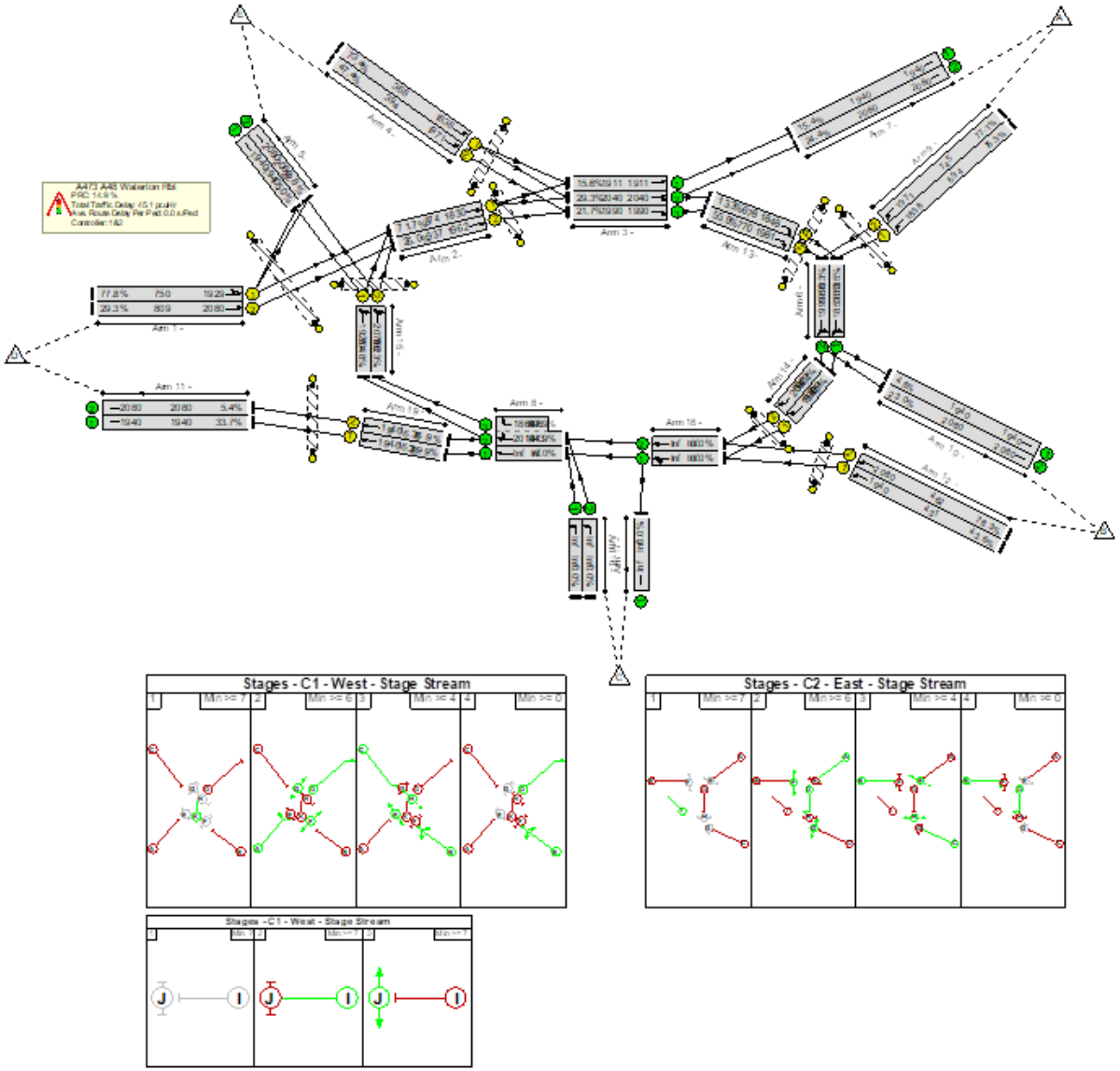
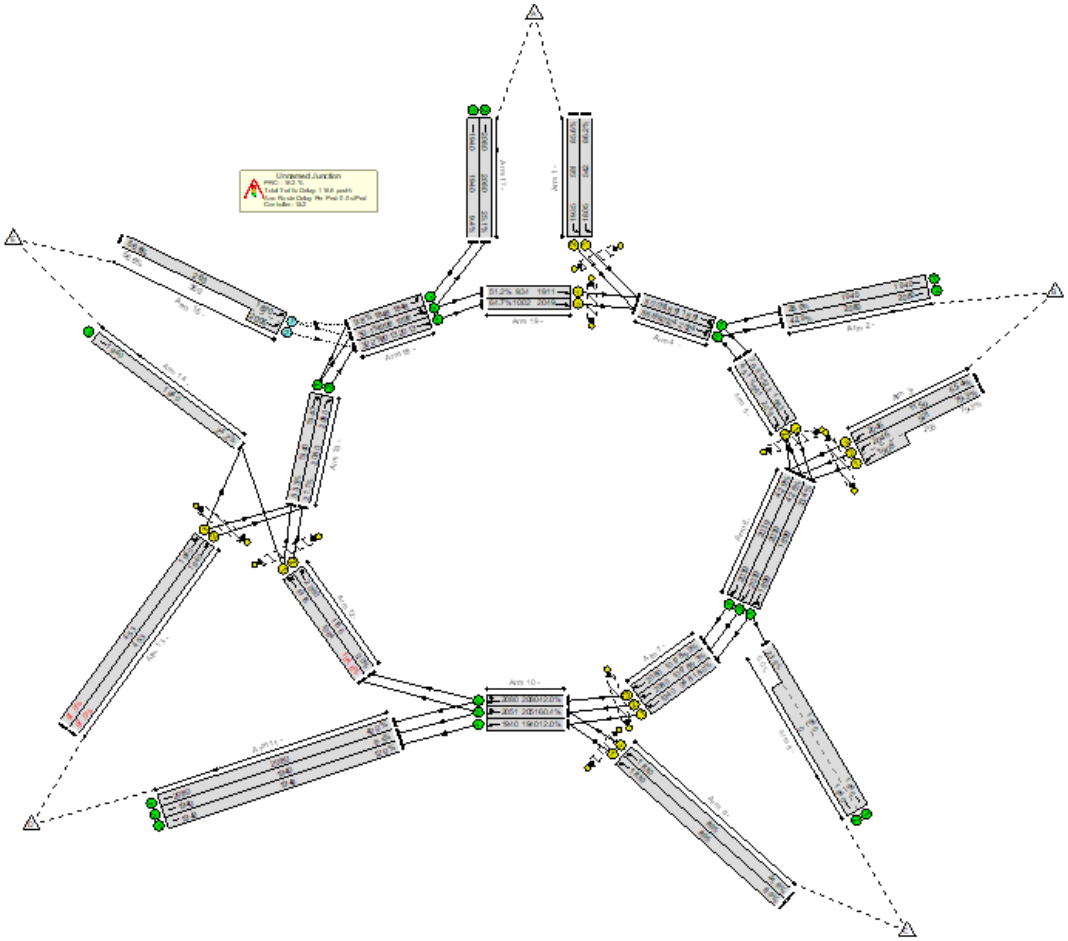


Figure C: Network Layout Diagram, Junction 6



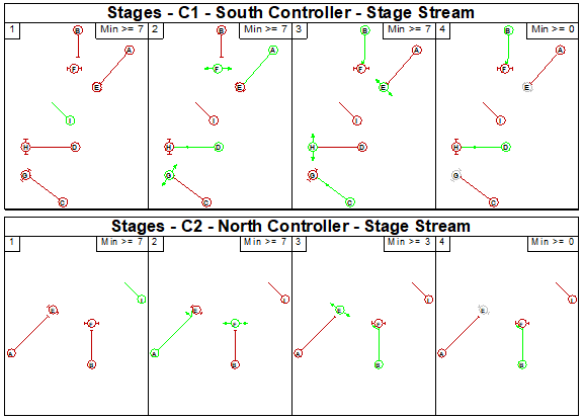


Figure D: Network Layout Diagram, Junction 8

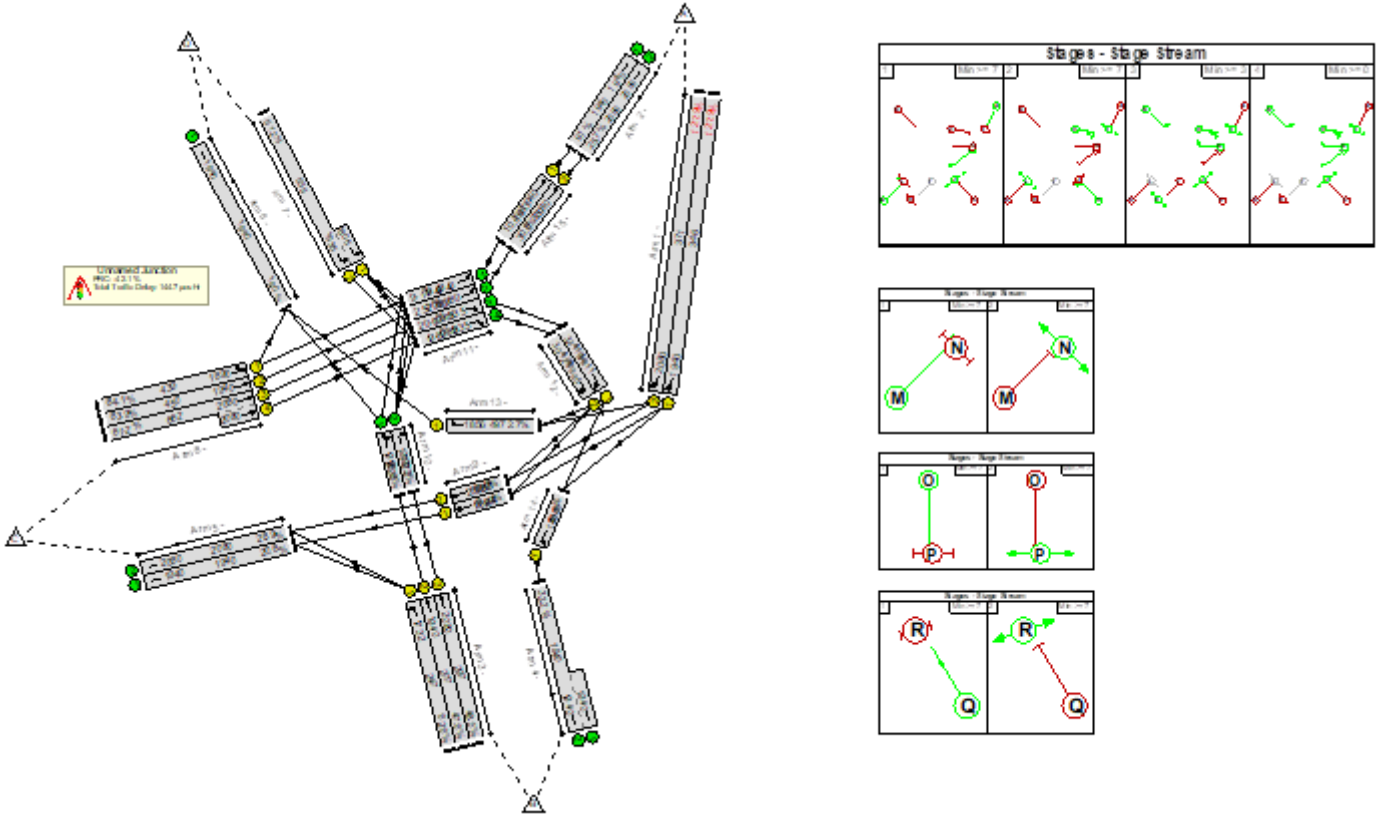


Figure E: Network Layout Diagram, Junction 10

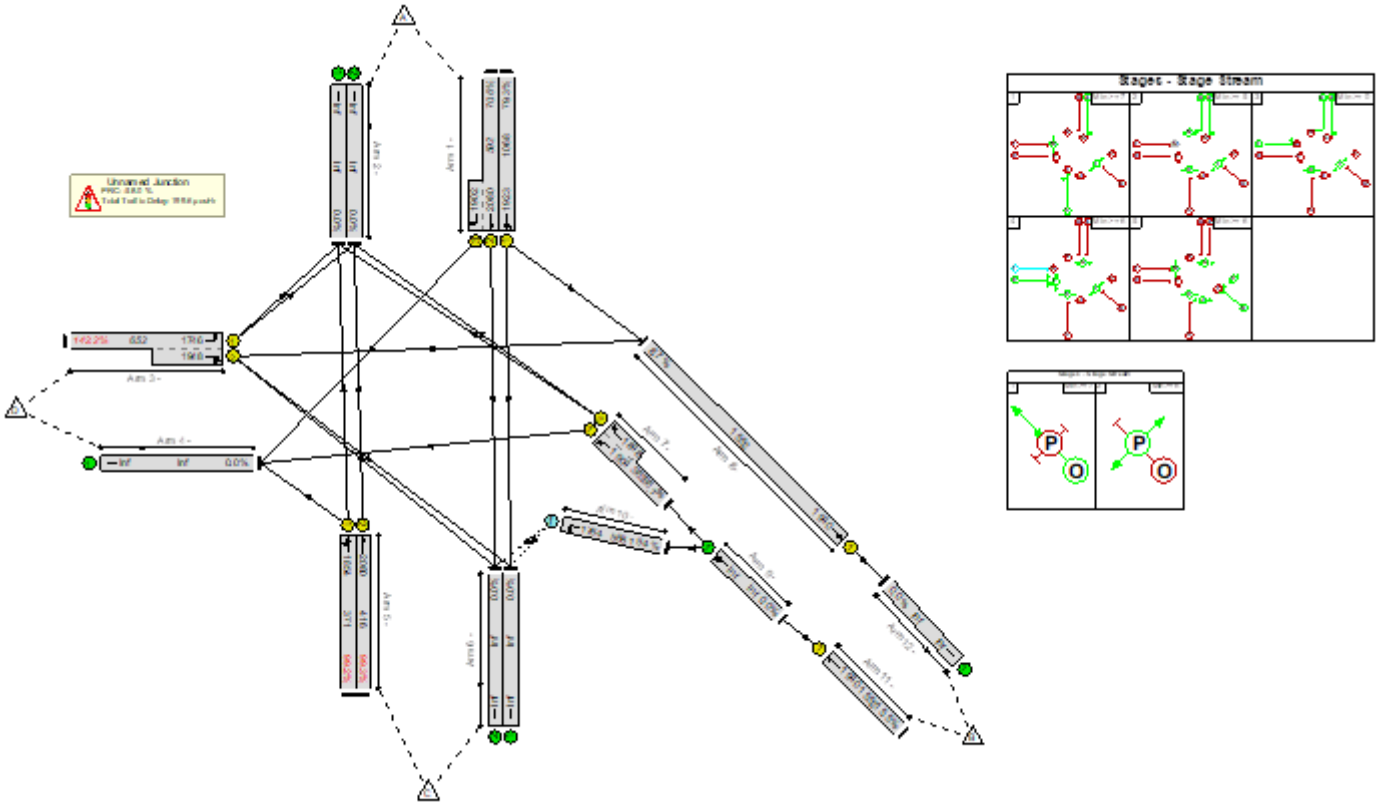
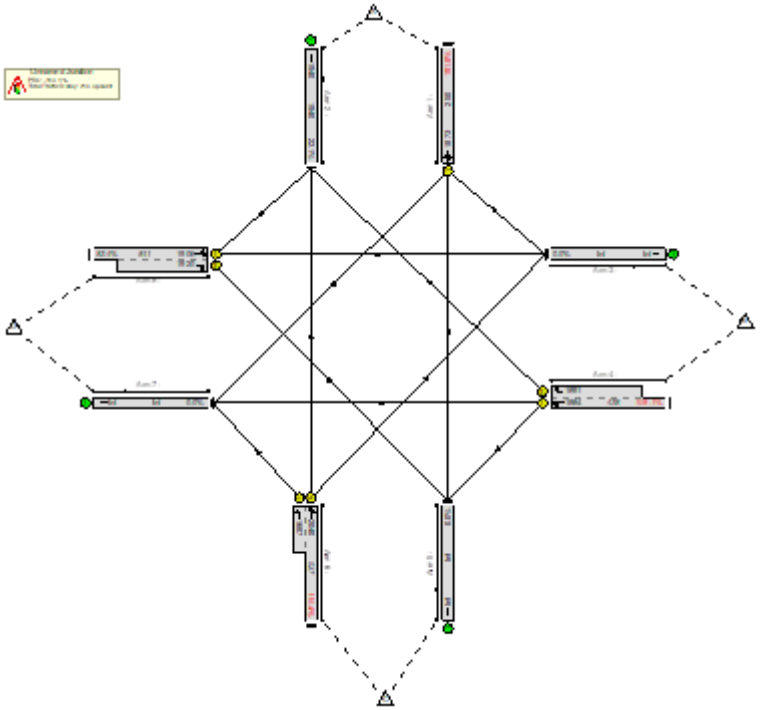


Figure F: Network Layout Diagram, Junction 16



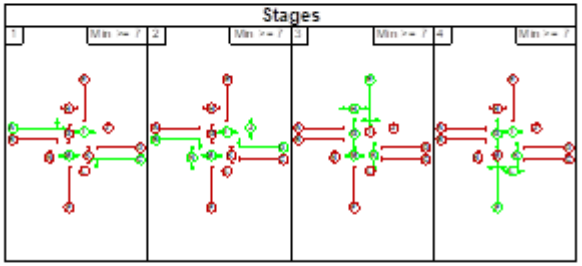
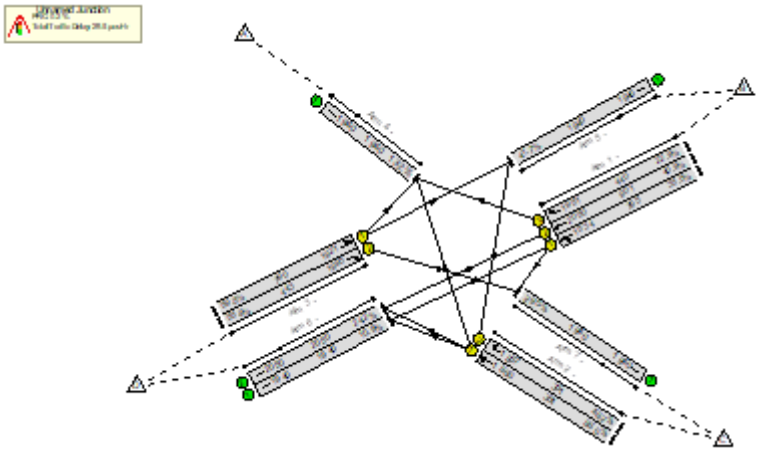


Figure G: Network Layout Diagram, Junction 17



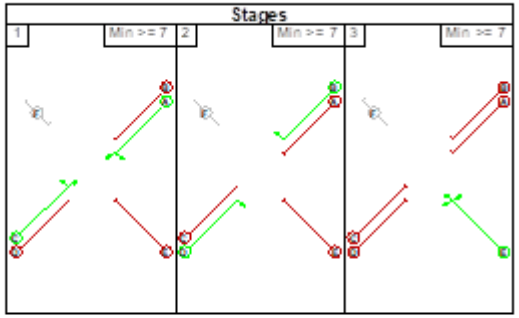
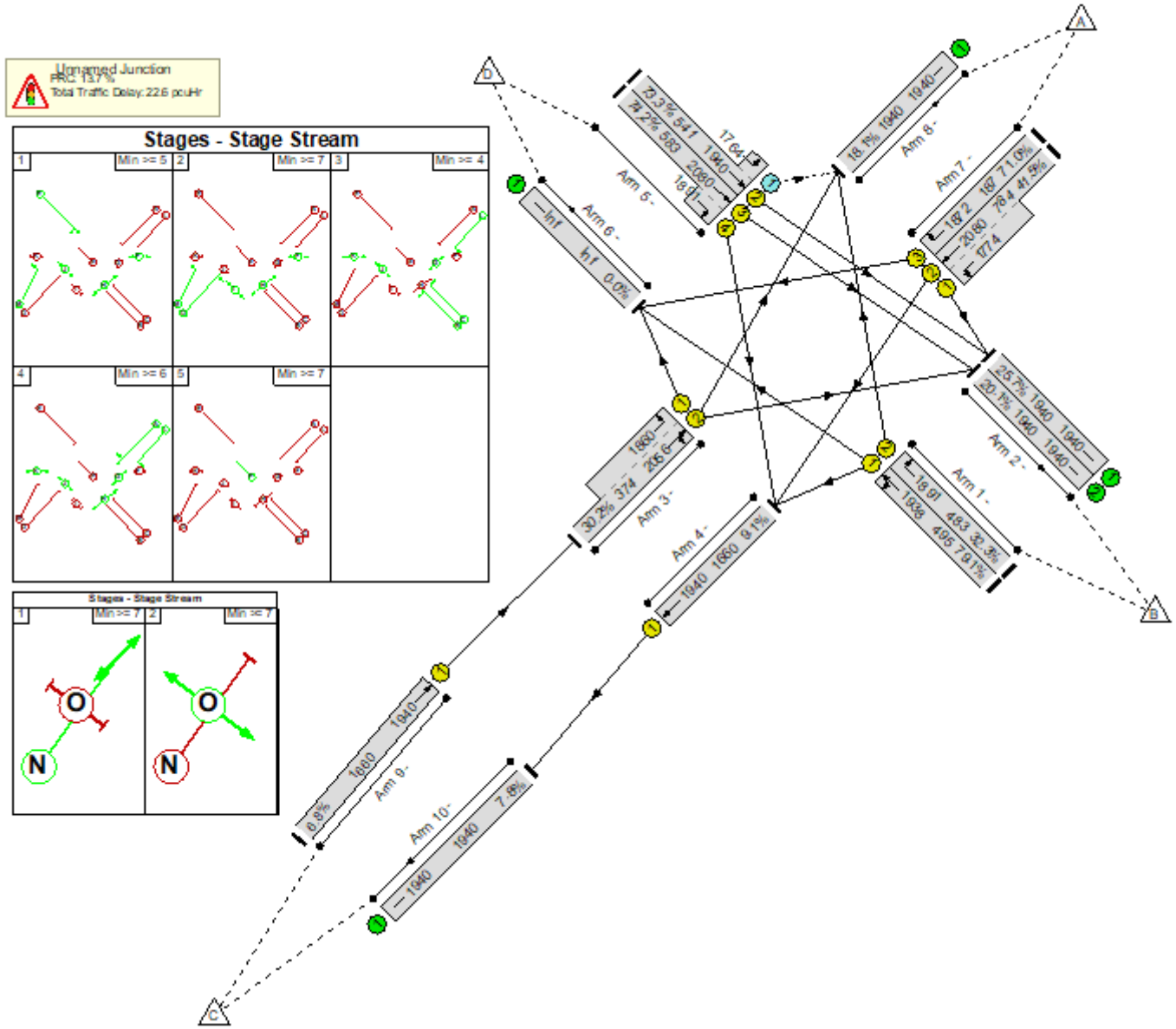


Figure H: Network Layout Diagram, Junction 22



Appendix C – Active Travel Map Summary

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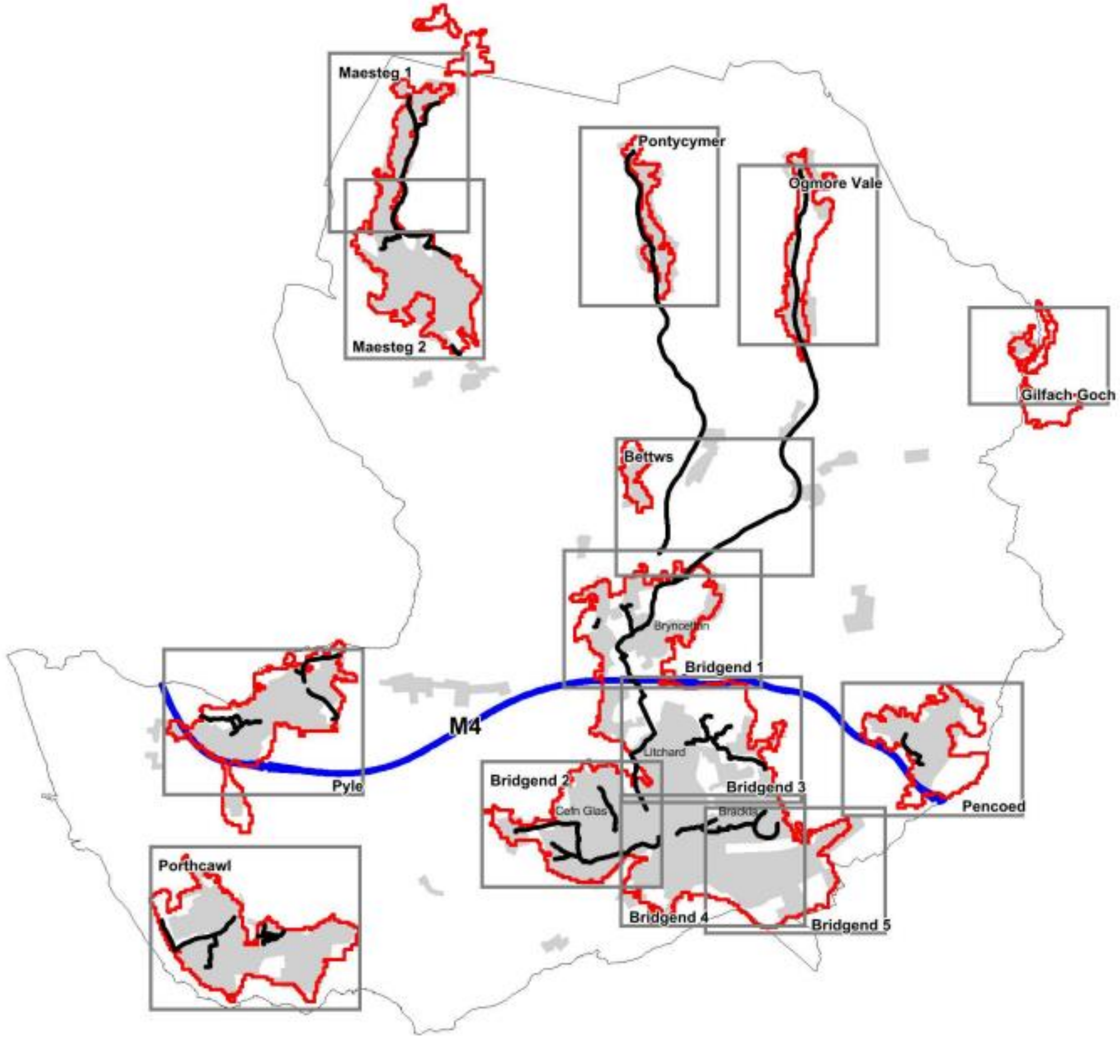
Bridgend County Borough Council

Active Travel
Existing Routes Map Consultation

Settlement	Route ID	Route
Bettws		
Bridgend	BRC1 BRC2a - c BRC3a - b BRC4 BRC5a - h BRC6a - c BRC7a - e BRC8a - d BRC9a -b BRC10 BRP1	Maesteg Road Link Sarn to Coleg Cymunedol y Dderwen Sarn to Abergarw Industrial Estate (NCN4) Brynmenyn to Blackmill (NCN4) Sarn to Bridgend (NCN885) Litchard to Brackla (via Parc Derwen) Bridgend to Brackla Bridgend to Broadlands Broadlands to Laleston Park Street to Cefn Glas Princess Way to Brackla Way
Gilfach Goch		
Maesteg	MAC1a - c MAC2 MAC3a - b MAC4	Caerau to Maesteg School (NCN885) Caerau Park to Caerau Square Maesteg Leisure Centre to Maesteg School (NCN885) Heol Neuadd Domos to Cwmfelin Primary School
Ogmore Vale	OVC1 OVC2 OVC3	Nantymoel to Ogmore Vale Leisure Centre Ogmore Vale to Leisure Centre Ogmore Vale to Blackmill
Pencoed	PEP1	Pencoed Comprehensive School Link
Pontycymer	POC1 POC2	Blaengarw to Pontycymer Pontycymer to Bryngarw Country Park
Porthcawl	PORC1a - d PORC2a - c PORP1	Rest Bay to Nottage Porthcawl Primary School Links Locks Lane to Porthcawl Comprehensive School Link
Pyle	PYC1a - b PYC2a - b PYC3a -d PYC4	Marlas to Pyle Railway Station Marlas to Cornelli Primary School Kenfig Hill to Bridge Street (NCN4) Bridge Street to Cynffig Comprehensive School



BRIDGEND COUNTY BOROUGH COUNCIL
COMMUNITIES DIRECTORATE

Corporate Director
Mark Shephard
Civic Offices
Angel Street
Bridgend CF31 4WB
Telephone (01656) 643643

Bridgend County Borough

Active Travel Overview Map

Not to Scale

Date 16/06/2015

MOTT MACDONALD

Bridgend Replacement Local Development Plan

Technical Note Series

Project:	Bridgend Replacement LDP		
Our reference:	100415574 – TN 004	**Your reference:**	
Prepared by:	Claudia Currie	**Date:**	June 2021
Approved by:	Claudia Currie	**Checked by:**	Margaret Henderson
Subject:	Uncertainty Log Development and Future Year Junction Model Assessment		

1 Introduction

Mott MacDonald was commissioned in January 2020 by Bridgend County Borough Council (BCBC) to develop a series of technical notes to help determine the traffic impact of committed developments and the proposed Candidate Sites on the highway network as part of evidence base supporting the Local Plan development process.

This technical note will report on the development of the uncertainty log and the future year highway situation using junction modelling tests to determine the impact of traffic at key junctions on the Bridgend highway network.

2 Uncertainty Log Development

An uncertainty log has been developed that takes account of all committed development within the BCBC area. Residential developments were reviewed against the BCBC Joint Housing Land Availability Study 2019 to establish the current level of build out which will be generating traffic on the highway and the additional traffic that will be generated once the developments are complete. The level of additional trips was established by extracting the trip generation estimates from the approved transport assessments submitted to BCBC as part of the original planning applications or using the appropriate TRICS database trip rate.

These targeted local growth rates were informed by development control estimates that are classified as “near certain”, “more than likely” and “reasonably foreseeable” in accordance with the Department for Transport DfT TAG Unit M4 - Table A2 Classification of Future Impact.

In addition, the trip generation estimates for each of the candidate sites was extracted from the appropriate transport assessments submitted to BCBC as part of the Local Plan Development.

The total number of trips in the Uncertainty Log were then distributed through each of the junctions for residential, employment and leisure trips using the Gravity Model Methodology below.

Step 1: Trip distribution

Trips were allocated according to the distribution suggested by the 2011 census journey to work data, downloaded from www.nomisweb.co.uk. (Table ID WF01BEW: Location of usual residence and place of work (OA level)). The 2011 census data is the latest available source and is the industry accepted standard used to estimate travel patterns from development sites that are likely to be constructed in the future.

A zoning system was used including the 19 Middle layer Super Output Areas (MSOAs) in Bridgend and surrounding local authority areas where the route may vary according to the start location in Bridgend. The remaining trips were allocated to the M4 westbound (Ceredigion, Pembrokeshire, Carmarthenshire and Swansea) or the M4 eastbound (all other destinations).

For each MSOA, the percentage of trips from that MSOA to work in each of the zones was calculated using the travel to work data. Similarly, the percentage of employment trips to each MSOA from each of the zones was calculated. Generally when looking to distribute future traffic onto a highway network it is accepted practice to use the main trip attractors for the relevant time period. In this case for the AM peak the predominate trip type is Home to Work and this has been used to distribute the Candidate Site trips across the BCBC highway network. This was then reversed for the PM peak, with minor changes to routeing to avoid trips being allocated to junction movements that would attempt to use one way streets in reverse.

An example of the MSOA data is provided below in Table 1, below;

Table 1: Example of a Workplace destinations calculation for residential developments within W02000218

From – Home	To – Workplace	Total trips	%
W02000218 : Bridgend 001	W02000218 : Bridgend 001	219	10%
	W02000219 : Bridgend 002	297	14%
	W02000220 : Bridgend 003	5	0%
	W02000221 : Bridgend 004	17	1%
	W02000222 : Bridgend 005	78	4%
	W02000223 : Bridgend 006	34	2%
	W02000224 : Bridgend 007	68	3%
	W02000225 : Bridgend 008	50	2%
	W02000226 : Bridgend 009	57	3%
	W02000227 : Bridgend 010	23	1%
	W02000228 : Bridgend 011	89	4%
	W02000229 : Bridgend 012	7	0%
	W02000230 : Bridgend 013	59	3%
	W02000231 : Bridgend 014	201	9%

	W02000232 : Bridgend 015	231	11%
	W02000233 : Bridgend 016	4	0%
	W02000234 : Bridgend 017	14	1%
	W02000235 : Bridgend 018	14	1%
	W02000236 : Bridgend 019	16	1%
	Neath Port Talbot	286	13%
	The Vale of Glamorgan	37	2%
	Rhondda Cynon Taf	79	4%
	Merthyr Tydfil	1	0%
	M4 East	179	8%
	M4 West	74	3%
	TOTAL	2,139	100%

Source: Office for National Statistics via www.nomisweb.co.uk. Table ID WF01BEW; Mott MacDonald

Step 2: Routing

For each origin-destination pair, a route was traced between the two points using the fastest route suggested by Google Maps. Where there was more than one likely route between zones, the traffic was assumed to be split equally between these.

For residential sites, it was assumed that the departure trips began at each specific site and ended at the area or areas of the destination zone where employment is most concentrated. Where there are multiple employment zones, the trips were split equally between them.

For employment sites, arrival trips were assumed to begin at the main residential areas of the origin zone and end at the site. Where there are multiple residential areas, the trips were split equally between them.

Step 3: Junction impact

When a route passed through one of the 26 assessed junctions, traffic was allocated to the appropriate movement. If all traffic passed through a junction movement it was scored as 1. Where traffic was split between two or more routes, an appropriate proportion of trips were allocated, for example half the traffic would score 0.5.

These scores were then multiplied by the trip numbers identified in the uncertainty log, to calculate the number of trips through each junction movement. Trip numbers were calculated for AM and PM departures for the residential sites and for the AM and PM arrivals for the employment sites.

The allocations for each of the development sites were then added together, to calculate the combined traffic impact of all the sites each of the 26 junctions modelled.

To obtain routing for residential arrivals and employment departures, the junction movements were reversed and manual adjustment made, where necessary, to account for one-way streets (Nolton

Street at junction 17) and restricted movements into Angel Street at junction 10, both in Bridgend town centre.

The following were then combined to obtain development totals for the AM peak and then transposed to create the equivalent PM peak future year trip numbers:

- residential AM departures
- residential AM arrivals
- employment AM departures
- employment AM arrivals

Step 4: Input future traffic flows into Junction Models

These trips were then added to the COVID uplifted base year 2020 and committed development flows to form the basis for the future year modelling.

3 Future Year Modelling

Future year modelling has been carried out the 26 locations as shown in Appendix A. The traffic flows are based on the base year data collected in October 2020 which have been uplifted to account for the reduced traffic levels resulting from local Welsh lockdowns (see Technical Note 1). The development traffic has been added to the relevant junctions using the gravity model developed from the uncertainty log for the already Committed Developments identified from extant Planning Permission and with the addition of the proposed LDP Candidate Sites (Table 2).

The additional residential numbers within the Candidate Sites that have been included in the future year junction assessments are detailed in, Table 2. These have been selected by Bridgend County Borough Council as the most likely future residential scenario and these include the proposed build out levels expected within the LDP Plan Period. All proposed employment sites have been included in the junction assessments at their full LDP allocation levels.

Table 2: Proposed Residential Candidate Sites Numbers for the LDP Plan Period

Allocated Residential Candidate Sites	Total	Site Capacity	Remaining Post LDP
Porthcawl Waterfront Regeneration Area	1200	1200	0
Island Farm	850	850	0
Land West of Bridgend	850	850	0
Parc Afon Ewenni	675	675	0
Land East of Pencoed	770	770	0
Land East of Pyle	900	2000	1100
Craig y Parcau	110	110	0
Land East of Bridgend Road, Pontyrhydycyf (Jehu)	140	140	0
Llangynwyd Four Seven Service Station (GJP)	102	102	0
Land at Llangynwyd (Persimmon)	117	117	0

The junctions have been modelled using Junctions9 and LINSIG, as appropriate, with the roundabouts and priority junctions being modelled using Junctions9 software and the signal controlled junctions being modelled using LINSIG software.

The operation of priority control junctions and roundabouts is measured in terms of a Ratio to Flow Capacity (RFC) value where a level at or below an RFC of 0.85 is considered to demonstrate a junction is operating well (for the detailed RFC output on each arm see Appendix B). Where junctions are operating with one arm slightly above an RFC of 1.0 there will generally be no noticeable or unacceptable queues and delays seen on the highway network during normal operation and this is indicated for each by a positive network residual capacity.

The operation of signal control junctions is measured in terms of Practical Reserve Capacity (PRC) value where a level at or below 90% is considered to demonstrate a junction is operating well (for the detailed PRC output on each arm see Appendix B). Where junctions are operating with a percentage degree of saturation below 100% on most arms there will generally be no noticeable or unacceptable queues and delays seen on the highway network during normal operation.

However, other external factors such as inappropriately parked or broken down vehicles may cause temporary short lived long queues as can incidents of extreme weather conditions when junctions are operating at or above their theoretical capacity which is measured as an RFC of 1.0 or a percentage degree of saturation of 100% for uncontrolled and signal controlled junctions, respectively.

Tables 3 (A and B) and 4 (A and B) provide an indication of the level of operation of each junction in both the AM and PM peak hour with the full output details shown in Appendix B. Most junctions, with their existing configurations, are showing some issues in both peak hours with all the proposed committed developments completed and all Candidate Sites fully built out, although some of the delays would be likely to be alleviated by local rerouting or retiming of journeys (peak spreading).

Committed Development Scenario

Table 3A: Network Residual Capacity (priority junctions and roundabouts)

Ref No	Survey Location	Junction Type	Network Residual Capacity	
			AM Peak	PM Peak
1	A4229 Pyle Rd/A4106 Newton Nottage Rd/A4106/Fulmar Rd	Roundabout	28%	37%
2	A48/A4106 Bridgend Road roundabout	Roundabout	14%	15%
3	A48/A473 roundabout	Roundabout	17%	76%
7	A4061/Heol Stradling/W Plas Rd roundabout	Roundabout	-4%	-16%
9	A4061/A473/Tondu Road roundabout	Roundabout	-2%	6%
11	A473/Glan-Y-Parc	Priority junction	6%	3%
12	St Leonards Road/A473	Priority junction	8%	-9%
13	Heol-Y-Nant/A473 Park Street	Priority junction	-12%	-28%
14	A4061/McArthur Glen	Roundabout	-14%	-32%
15	A4061/Litchard Hill/Heol Y Groes	Roundabout	-30%	-4%

Ref No	Survey Location	Junction Type	Network Residual Capacity	
			AM Peak	PM Peak
18	A48 Bypass Road/B4622	Roundabout	-55%	-32%
19	A48 Crack Hill/Brocastle Manor	Roundabout	41%	80%
20	A48 Crack Hill/B4524 Corntown Road	Priority junction	29%	76%
21	A4229/A48/Pyle Road	Roundabout	19%	34%
23	A4063/Park Road	Roundabout	-24%	-19%
24	A4061/Heol Canola	Priority junction	-30%	-20%
25	A4093/A4061/Heol Pant-Yr-Arwel	Priority junction	70%	81%
26	Penybont Road/Hendre Road/Coychurch Road/ Heol-Y-Groes	Priority junction	-4%	6%

Table 3B: Network Degree of Saturation (signal controlled junctions)

Ref No	Survey Location	Junction Type	Degree of Saturation	
			AM Peak	PM Peak
4	A48 Bypass Road/ B4265 Ewenny Road roundabout	Signalised roundabout	168.3%	101.4%
5	A473/A48 Roundabout	Signalised roundabout	177.0%	144.6%
6	A473 Waterton Road / Brocastle Avenue/ A473 Waterton Road/ B4181 Coychurch Road	Signalised roundabout	102.9%	181.1%
8	A4061 Rotary International Way/B4181 Tremains Road/Boulevard De Villenave/Coity Road	Signalised gyratory	84.8%	80.2%
10	A473 Tondu Road/Angel Street/Park Street	Signalised junction	188.9%	194.6%
16	A473/B4622/Bright Hill	Signalised junction	256.9%	183.2%
17	A483 Cowbridge Road/B4265 Ewenny Road/ A473 Langenau Strasse/Nolton Street	Signalised junction	111.4%	86.0%
22	*A4063 Maesteg Road/A4065 Bryn Road/Bridgend Road*	*Signalised junction*	*407.5%*	*394.4%*

Committed Development and Candidate Site Scenario

Table 4A: Network Residual Capacity (priority junctions and roundabouts)

Ref No	Survey Location	Junction Type	Network Residual Capacity	
			AM Peak	PM Peak
1	A4229 Pyle Rd/A4106 Newton Nottage Rd/A4106/Fulmar Rd	Roundabout	4%	8%
2	A48/A4106 Bridgend Road roundabout	Roundabout	-16%	-15%
3	A48/A473 roundabout	Roundabout	-12%	23%
7	A4061/Heol Stradling/W Plas Rd roundabout	Roundabout	-7%	-5%

Ref No	Survey Location	Junction Type	Network Residual Capacity	
			AM Peak	PM Peak
9	A4061/A473/Tondu Road roundabout	Roundabout	-11%	6%
11	A473/Glan-Y-Parc	Priority junction	-11%	-14%
12	St Leonards Road/A473	Priority junction	-23%	-24%
13	Heol-Y-Nant/A473 Park Street	Priority junction	-23%	-38%
14	A4061/McArthur Glen	Roundabout	-16%	-34%
15	A4061/Litchard Hill/Heol Y Groes	Roundabout	-32%	-8%
18	A48 Bypass Road/B4622	Roundabout	-66%	-52%
19	A48 Crack Hill/Brocastle Manor	Roundabout	34%	69%
20	A48 Crack Hill/B4524 Corntown Road	Priority junction	19%	61%
21	A4229/A48/Pyle Road	Roundabout	-13%	-3%
23	A4063/Park Road	Roundabout	-28%	-25%
24	A4061/Heol Canola	Priority junction	-35%	-24%
25	A4093/A4061/Heol Pant-Yr-Arwel	Priority junction	67%	77%
26	Penybont Road/Hendre Road/Coychurch Road/ Heol-Y-Groes	Priority junction	-6%	2%

Table 4B: Network Degree of Saturation (signal controlled junction)

Ref No	Survey Location	Junction Type	Degree of Saturation	
			AM Peak	PM Peak
4	A48 Bypass Road/ B4265 Ewenny Road roundabout	Signalised roundabout	191.5%	138.4%
5	A473/A48 Roundabout	Signalised roundabout	239.1%	199.4%
6	A473 Waterton Road / Brocastle Avenue/ A473 Waterton Road/ B4181 Coychurch Road	Signalised roundabout	130.2%	270.6%
8	A4061 Rotary International Way/B4181 Tremains Road/Boulevard De Villenave/Coity Road	Signalised gyratory	88.3%	83.0%
10	A473 Tondu Road/Angel Street/Park Street	Signalised junction	232.8%	253.9%
16	A473/B4622/Bright Hill	Signalised junction	335.9%	258.6%
17	A483 Cowbridge Road/B4265 Ewenny Road/ A473 Langenau Strasse/Nolton Street	Signalised junction	178.5%	114.0%
22	*A4063 Maesteg Road/A4065 Bryn Road/Bridgend Road*	*Signalised junction*	*465.8%*	*476.8%*

The modelling outputs at Junction 22 (above) are included for comparison purposes only using the existing junction layout to demonstrate that the significant highway improvements included in the

Candidate Site development proposals for the Tondu area are necessary as part of a package of mitigation measures. The associated Transport Assessment (Ref: Vectos Report April 2016 - Merthyr Mawr Estate: Land West of Maesteg Road ,Tondu) provides a number of proposed new highway layouts to support these mitigation proposals which are detailed below, and in Technical Note 7. The proposed improvements would be phased over the construction period of the Development and will be discharged through a series of conditions to ensure they match the build out trigger points with an anticipated completion data of 2023. The improvements will include:

- a new roundabout to facilitate access to the site linking Pentre Felin (Lidl) to the proposed link road;
- an improved MOVA signal controlled crossroads covering traffic using Maesteg Road/Bryn Road/Bridgend Road and the A4063 (replacing junction modelled 22 Above); and
- an upgraded roundabout for the A4063/Tondu/B4281

From the tables above, it should be noted that the operation of Junction 17, in the centre of Bridgend, operates significantly differently in the AM and PM as it is affected by Nolton Street being a one-way route allowing traffic to exit the junction, but not enter. Also Junction 8 operates well in all situations as it forms part of the access arrangements to/from the inner bypass route along the A4061.

4 External Factors Influencing the Operational Performance of nearby Junctions

Redstart have published a report in February 2021 entitled Pencoed Level Crossing Draft Traffic Capacity Study (Ref CS/099865/01) which discusses the effects that the level crossing in Pencoed has on the surrounding junctions, including Junction 26 above, the report concludes that the junction generally appears to work well but that the adjacent level crossing regularly creates queues back to Coychurch Road, which has an adverse impact on operation.

5 Conclusion

Technical Note 4 has summarised the future year modelling assessments and has highlighted the junctions where significant highway improvements should be considered. Proposed mitigation measures are discussed in Technical Note 7 for junctions within BCBC. The junctions that have the most congestion are already signalised and the worst delay is on arms where the same lanes are currently used for more than one movement within the existing signal phasing. The junctions that are of most concern, and have been identified in the tables above, are:-

- A48 Bypass Road/ B4265 Ewenny Road roundabout (Site 4)
- A473 / A48 Roundabout (Site 5)
- A473 Waterton Road / Brocastle Avenue/ A473 Waterton Road / B4181 Coychurch Road (Site 6)
- A473 Tondu Road / Angel Street/Park Street (Site10)

- A473 / B4622 / Bright Hill (Site16)
- A483 Cowbridge Road/B4265 Ewenny Road / A473 Langenau Strasse / Nolton Street (Site17)

The need for improvements at Junction 36 has previously been identified by the Welsh Government and a WelTAG Stage 2 Study is being carried out to investigate improvements. Any short listed options identified as a part of that study will then be submitted to the Welsh Ministers for consideration to enable further developments within BCBC to be accommodated north of the M4. However, a moratorium on Strategic Trunk Road improvements was announced by the Deputy Climate Change Minister Lee Waters on Tuesday 22nd June 2021:

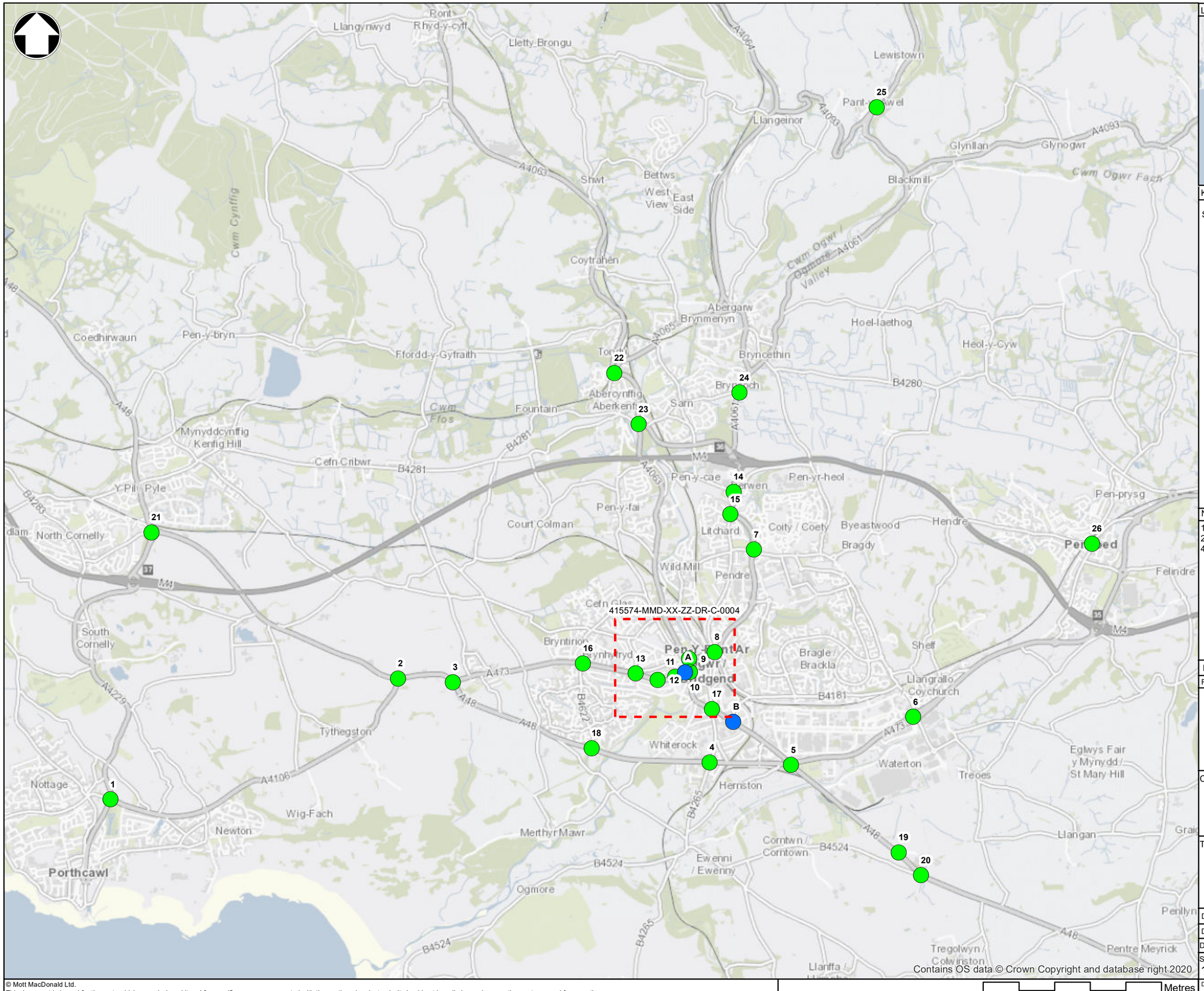
"*All new road-building projects in Wales are being frozen while the Welsh government conducts a review*…….*Officials are in the final stages of establishing a roads review panel that will include some of the UK's leading experts on transport and climate change. The panel will consider setting tests for when new roads are the right solutions for transport problems, in line with the new Wales transport strategy.*

As a result no improvements to Junction 36 are envisaged within the foreseeable future and as such further LDP developments north of the M4 cannot be adequately accommodated on the existing congested highway network without significant financial investment that is beyond the reasonable scope for Developers to deliver.

6 Recommendation

Possible highway and modal shift solutions are discussed in Technical Note 7 with a view to returning the junction operation to a 'nil detriment' position with all the proposed Candidate Site developments in place. Where possible, developments that have had the most significant impact on the highway network will be identified to enable an appropriate planning contribution to highway improvements to be established and charged.

Appendix A – Survey Locations for Junction Modelling



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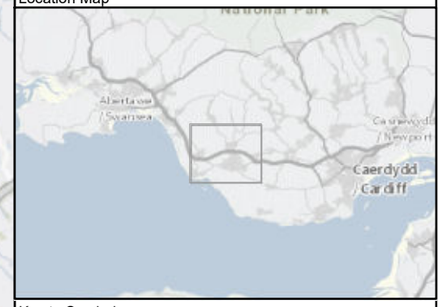
Location Map



Key to Symbols

Survey locations

- ATC
- JTC

Notes

1. For information only.
2. To be read in conjunction with: 415574-MMD-XX-ZZ-DR-C-0004

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	25/01/21	JW	For information	MH	CC

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Title: Bridgend Traffic Survey Scoping Survey Locations

Designed	J Wu	JW	Eng. Check	M Henderson	MH
Drawn	J Wu	JW	Coordination	M Henderson	MH
Dwg Check	J Keane	JK	Approved	C Currie	CC

Scale at A3	Status	Rev	Security
1:50,000	INF	P1	STD

Drawing Number: 415574-MMD-XX-ZZ-DR-C-0003

Metres: 0 500 1,000 1,500 2,000 2,500

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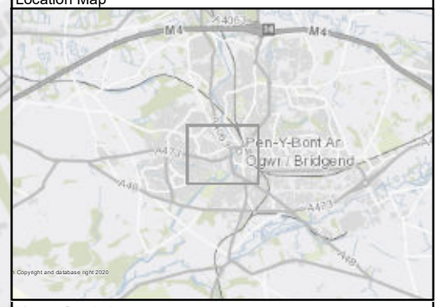
Location Map



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Survey locations

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Notes

1. For information only.
2. To be read in conjunction with: 415574-MMD-XX-ZZ-DR-C-0003

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	25/01/21	JW	For information	MH	CC

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Title: Bridgend Traffic Survey Scoping Survey Locations

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Drawn	J Wu	JW	Coordination	M Henderson	MH
Dwg Check	J Keane	JK	Approved	C Currie	CC

Scale at A3	Status	Rev	Security
1:5,000	INF	P1	STD

Drawing Number: 415574-MMD-XX-ZZ-DR-C-0004

Metres: 0 50 100 150 200 250

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Appendix B – Junction Modelling Output Summary Tables Committed Developments only

This report provides an overview of the junction modelling undertaken to assess the capacity at which junctions are operating in both the AM and PM peak hour. The arms of each junction are labelled clockwise and the corresponding road names are provided below.

Junction Arms- Road Names

Junction	Arm	Description
Junction 1	Arm 1	Pyle Road
	Arm 2	Newton Nottage Road
	Arm 3	A4106
	Arm 4	Fulmar Road
Junction 2	Arm 1	A48 (east)
	Arm 2	Bridgend Road
	Arm 3	A48 (west)
Junction 3	Arm 1	A473
	Arm 2	A48 (south)
	Arm 3	A48 (north)
Junction 4	Arm 1	B4265 (north)
	Arm 2	A48 (east)
	Arm 3	B4265 (south)
	Arm 4	A48 (west)
Junction 5	Arm A	A473 Waterton Road
	Arm B	A48 Cowbridge Road
	Arm C	Shopping Centre Access
	Arm D	A48 Bypass Road
	Arm E	A473 Cowbridge Road
Junction 6	Arm A	B4181 Coychurch Road
	Arm B	A473 Coychurch Road
	Arm C	Brocastle Avenue
	Arm D	A473 Waterton Road
	Arm E	David Street
Junction 7	Arm A	A473 Waterton Road
	Arm B	A48 (east)
	Arm C	Retail Park
	Arm D	A48
	Arm E	A473 Cowbridge Road
Junction 8	Arm A	A4061 Rotary International Way
	Arm B	B4181 Tremains Road
	Arm C	A4061 (west)
	Arm D	Coity Road
Junction 9	Arm 1	Boulevard De Villenave D'Ornon
	Arm 2	Tondu Road (south)
	Arm 3	Tondu Road (north)
Junction 10	Arm A	Tondu Road
	Arm B	Angel Street
	Arm C	A473
	Arm D	Park Street
Junction 11	Arm 1	B473 (east)
	Arm 2	Glan-Y-Parc
	Arm 3	B473 (west)
Junction 12	Arm A	St Leonard's Road
	Arm B	A473 (east)
	Arm C	Unnamed Road
	Arm D	A473 (west)
Junction 13	Arm A	Heol-Y-Nant
	Arm B	Park Street (east)
	Arm C	Park Street (west)
Junction 14	Arm 1	A4061

	Arm 2	Litchard Hill
	Arm 3	Retail Park (east)
	Arm 4	Retail Park (Sainsbury's Entrance)
Junction 15	Arm 1	Litchard Hill (north)
	Arm 2	A4061
	Arm 3	Litchard Hill (south)
	Arm 4	Heol-Y-Groes
Junction 16	Arm A	A473 Waterton Road
	Arm B	A48 (east)
	Arm C	Retail Park
	Arm D	A473 Langenau Strasse
	Arm E	A473 Cowbridge Road
Junction 17	Arm A	Nolton Street
	Arm B	A473 Cowbridge Road
	Arm C	B4265
	Arm D	A473
Junction 18	Arm 1	B4622
	Arm 2	A48 (east)
	Arm 3	A48 (west)
Junction 19	Arm 1	Unnamed access
	Arm 2	Brocastle Manor Care Home
	Arm 3	A48 (east)
	Arm 4	A48 (west)
Junction 20	Arm A	A48 (towards Ewenny)
	Arm B	B4524
	Arm C	A48 (towards Bridgend)
Junction 21	Arm 1	A48 (north)
	Arm 2	A48 (east)
	Arm 3	A4229
	Arm 4	Unnamed road (towards North Cornelly)
Junction 22	Arm A	Bryn Road
	Arm B	A4063
	Arm C	Bridgend Road
	Arm D	Maesteg Road
Junction 23	Arm 1	A4063 (north)
	Arm 2	A4063 (east)
	Arm 3	A4063 (south)
	Arm 4	B4281
Junction 24	Arm A	A4061 (north)
	Arm B	A4061 (south)
	Arm C	Heol Canola
Junction 25	Arm A	Heol Pant-Yr-Awel (leading onto Blackmill Road)
	Arm B	A40461
	Arm C	A4093
	Arm D	Heol Pant-Yr-Awel (leading onto Woodland Terrace)
Junction 26	Arm A	Penybont Road
	Arm B	Heol-Y-Groes
	Arm C	Coychurch Road
	Arm D	Hendre Road

Junction 1, Arcady 9 – Roundabout Module

Table 1: Summary of Junction Performance, Junction 1

	AM						PM					
	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020											
Arm 1	D1	1.6	6.14	0.62	A	28 % [Arm 4]	D2	1.8	6.33	0.64	A	37 % [Arm 1]
Arm 2		1.5	6.41	0.59	A			1.4	6.35	0.59	A	
Arm 3		0.4	2.29	0.29	A			0.4	2.27	0.28	A	
Arm 4		1.7	8.67	0.64	A			0.8	5.26	0.44	A	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 2. Arcady 9 – Roundabout Module

Table 2: Summary of Junction Performance, Junction 2

	AM									PM								
	Set ID	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity	Set ID	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity
	2020																	
Arm 1	D1	1.6	2.7	4.02	0.61	A	7.62	A	14 % [Arm 2]	D2	5.3	24.0	9.65	0.85	A	7.44	A	15 % [Arm 1]
Arm 2		3.1	13.4	12.52	0.76	B					1.0	2.5	6.52	0.51	A			
Arm 3		2.9	7.5	8.07	0.75	A					0.8	2.2	3.12	0.44	A			

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 3, Arcady 9 – Roundabout Module

Table 3: Summary of Junction Performance, Junction 3

	AM									PM								
	Set ID	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity	Set ID	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity
	2020																	
Arm 1	D1	1.5	2.9	8.35	0.61	A	6.98	A	17 % [Arm 3]	D2	0.5	2.4	3.44	0.35	A	3.14	A	76 % [Arm 3]
Arm 2		0.1	0.5	3.48	0.07	A					0.1	0.5	3.31	0.08	A			
Arm 3		4.9	19.3	8.02	0.83	A					1.2	1.6	2.85	0.54	A			

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 4, LINSIG

Table 4a: Junction 4 (AM)

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: A48 Ewenny Roundabout	-	-	-		-	-	-	-	-	-	**168.3%**	**0**	**0**	**0**	**172.2**	-	-
A48 Ewenny Roundabout	-	-	-		-	-	-	-	-	-	**168.3%**	**0**	**0**	**0**	**172.2**	-	-
1/1	Entry A48 Bypass Road (W) Ahead Left	U	D		1	46	-	998	1932	1009	98.9%	-	-	-	19.2	69.2	37.7
1/2+1/3	Entry A48 Bypass Road (W) Ahead	U	D		1	46	-	1093	2080:2080	1028+88	98.0 : 98.0%	-	-	-	18.0	59.4	37.7
2/1	Ahead	U	E		2	49	-	862	1940	1099	75.3%	-	-	-	2.1	9.1	4.0
2/2	Ahead	U	E		2	49	-	1072	2080	1179	88.7%	-	-	-	4.4	15.0	6.4
2/3	Right	U	E		2	49	-	86	1857	1052	8.2%	-	-	-	0.1	3.5	0.2
3/1+3/2	Entry B4265 Ewenny Road (N) Left Ahead	U	L		1	10	-	377	1867:2080	228+113	110.4 : 110.4%	-	-	-	26.9	257.0	29.0
4/1	Exit A48 Bypass Road (E)	U	-		-	-	-	870	1940	1940	43.0%	-	-	-	0.4	1.6	0.4
4/2	Exit A48 Bypass Road (E)	U	-		-	-	-	1195	2080	2080	55.6%	-	-	-	0.6	1.9	0.6
5/1	Exit B4265 Ewenny Road (N)	U	-		-	-	-	506	1940	1940	22.4%	-	-	-	0.1	1.2	0.1
6/1	Ahead	U	I		1	23	-	206	1940	517	37.6%	-	-	-	0.9	15.7	2.2
6/2	Right	U	I		1	23	-	126	1857	495	25.4%	-	-	-	0.2	5.1	1.3
7/1	Entry A48 Bypass Road (E) Left Ahead	U	F		1	54	-	400	1918	1172	34.1%	-	-	-	1.2	10.9	5.1
7/2+7/3	Entry A48 Bypass Road (E) Ahead	U	F		1	54	-	465	1940:1940	974+284	37.0 : 37.0%	-	-	-	1.3	10.4	4.5
8/2+8/1	Entry B4265 Ewenny Road (S) Left Ahead	U	M		1	7	-	397	2080:1914	89+147	168.3 : 168.3%	-	-	-	93.3	845.7	96.7
9/1	Exit B4265 Ewenny Road (S)	U	-		-	-	-	332	1940	1940	16.5%	-	-	-	0.1	1.1	0.1
10/1	Ahead	U	G		1	73	-	274	1940	1595	17.2%	-	-	-	0.1	1.4	0.1
10/2	Ahead	U	G		1	73	-	479	1940	1595	30.0%	-	-	-	0.3	2.5	1.0
10/3	Right	U	G		1	73	-	112	1732	1424	7.9%	-	-	-	0.0	1.6	0.1
12/1	Ahead	U	J		1	23	-	282	1940	517	40.9%	-	-	-	2.3	38.7	4.0
12/2	Right	U	J		1	23	-	153	1732	462	20.0%	-	-	-	0.7	27.0	1.0
Ped Link: P1	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P2	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P3	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P4	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P5	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P6	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P7	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P8	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf

C1 Stream: 1 PRC for Signalled Lanes (%): -87.0 Total Delay for Signalled Lanes (pcuHr): 170.98 Cycle Time (s): 90
C1 Stream: 2 PRC for Signalled Lanes (%): 0.0 Total Delay for Signalled Lanes (pcuHr): 0.00 Cycle Time (s): 90
PRC Over All Lanes (%): -87.0 Total Delay Over All Lanes(pcuHr): 172.23

Table 4b: Junction 4 (PM)

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: A48 Ewenny Roundabout	-	-	-		-	-	-	-	-	-	**101.4%**	**0**	**0**	**0**	**66.0**	-	-
A48 Ewenny Roundabout	-	-	-		-	-	-	-	-	-	**101.4%**	**0**	**0**	**0**	**66.0**	-	-
1/1	Entry A48 Bypass Road (W) Ahead Left	U	D		1	39	-	457	1932	859	53.2%	-	-	-	2.9	22.7	8.8
1/2+1/3	Entry A48 Bypass Road (W) Ahead	U	D		1	39	-	541	2080:2080	833+140	55.6 : 55.6%	-	-	-	3.3	21.7	9.2
2/1	Ahead	U	E		2	47	-	369	1940	1056	34.9%	-	-	-	0.4	4.0	0.9
2/2	Ahead	U	E		2	47	-	580	2080	1132	51.2%	-	-	-	0.9	5.5	1.9
2/3	Right	U	E		2	47	-	78	1857	1011	7.7%	-	-	-	0.1	3.1	0.2
3/1+3/2	Entry B4265 Ewenny Road (N) Left Ahead	U	L		1	12	-	422	1902:2080	275+158	97.5 : 97.5%	-	-	-	12.3	105.2	14.6
4/1	Exit A48 Bypass Road (E)	U	-		-	-	-	370	1940	1940	19.1%	-	-	-	0.1	1.1	0.1
4/2	Exit A48 Bypass Road (E)	U	-		-	-	-	650	2080	2080	31.3%	-	-	-	0.2	1.3	0.2
5/1	Exit B4265 Ewenny Road (N)	U	-		-	-	-	286	1940	1940	14.7%	-	-	-	0.1	1.1	0.1
6/1	Ahead	U	I		1	30	-	274	1940	668	41.0%	-	-	-	0.9	12.1	2.2
6/2	Right	U	I		1	30	-	155	1857	640	24.2%	-	-	-	0.2	3.9	1.8
7/1	Entry A48 Bypass Road (E) Left Ahead	U	F		1	47	-	990	1926	1027	96.4%	-	-	-	14.5	52.8	32.6
7/2+7/3	Entry A48 Bypass Road (E) Ahead	U	F		1	47	-	987	1940:1940	999+51	94.0 : 94.0%	-	-	-	11.8	43.1	29.2
8/2+8/1	Entry B4265 Ewenny Road (S) Left Ahead	U	M		1	12	-	351	2080:1906	131+215	101.4 : 101.4%	-	-	-	14.4	147.2	17.7
9/1	Exit B4265 Ewenny Road (S)	U	-		-	-	-	475	1940	1940	24.5%	-	-	-	0.2	1.2	0.2
10/1	Ahead	U	G		1	68	-	789	1940	1487	53.0%	-	-	-	0.6	2.6	0.6
10/2	Ahead	U	G		1	68	-	1093	1940	1487	73.5%	-	-	-	1.5	5.0	2.0
10/3	Right	U	G		1	68	-	49	1732	1328	3.7%	-	-	-	0.0	1.5	0.0
12/1	Ahead	U	J		1	30	-	182	1940	668	27.0%	-	-	-	1.1	21.7	2.2
12/2	Right	U	J		1	30	-	133	1732	597	22.3%	-	-	-	0.6	17.0	0.9
Ped Link: P1	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P2	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P3	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P4	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P5	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P6	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P7	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P8	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf

C1 Stream: 1 PRC for Signalled Lanes (%): -12.6 Total Delay for Signalled Lanes (pcuHr): 65.43 Cycle Time (s): 90
C1 Stream: 2 PRC for Signalled Lanes (%): 0.0 Total Delay for Signalled Lanes (pcuHr): 0.00 Cycle Time (s): 90
PRC Over All Lanes (%): -12.6 Total Delay Over All Lanes(pcuHr): 66.03

Junction 5, LINSIG

Table 5a: Junction 5 (AM)

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: A473 A48 Waterton Rbt	-	-	-		-	-	-	-	-	-	**177.0%**	**0**	**0**	**0**	**612.5**	-	-
A473 A48 Waterton Rbt	-	-	-		-	-	-	-	-	-	**177.0%**	**0**	**0**	**0**	**612.5**	-	-
1/1	Ahead Left	U	C1:A		1	39	-	1024	1930	858	119.4%	-	-	-	100.0	351.4	115.8
1/2	Ahead	U	C1:A		1	39	-	700	2080	924	75.7%	-	-	-	5.6	28.8	16.1
2/1	Ahead	U	C1:D		2	46	-	1187	1830	976	102.9%	-	-	-	28.0	100.4	46.2
2/2	Ahead	U	C1:D		2	46	-	700	1962	1046	66.9%	-	-	-	1.4	7.3	13.6
3/1	Ahead	U	-		-	-	-	607	1911	1911	24.5%	-	-	-	0.2	1.2	0.2
3/2	Ahead Ahead2	U	-		-	-	-	1050	2013	2013	38.5%	-	-	-	0.3	1.5	0.3
3/3	Ahead	U	-		-	-	-	1055	1990	1990	49.5%	-	-	-	0.5	1.8	0.5
4/1	Ahead	U	C1:C		1	12	-	470	1838	265	177.0%	-	-	-	117.9	903.3	123.4
4/2	Ahead	U	C1:C		1	12	-	355	1971	285	124.7%	-	-	-	43.8	443.9	48.4
5/1		U	-		-	-	-	274	1940	1940	12.3%	-	-	-	0.1	1.1	0.1
5/2		U	-		-	-	-	627	2080	2080	26.5%	-	-	-	0.2	1.2	0.2
6/1	Left Ahead	U	-		-	-	-	1404	1870	1870	61.1%	-	-	-	0.8	2.5	0.8
6/2	Left Ahead	U	-		-	-	-	1886	2005	2005	75.6%	-	-	-	1.5	3.7	1.5
7/1		U	-		-	-	-	607	1940	1940	24.1%	-	-	-	0.2	1.2	0.2
7/2		U	-		-	-	-	424	2080	2080	15.7%	-	-	-	0.1	1.0	0.1
8/2+8/3	Right Ahead	U	-		-	-	-	1274	2019:1860	1108+839	57.5 : 57.9%	-	-	-	0.8	2.4	17.7
9/1	Left	U	C2:A		1	33	-	778	1838	694	112.0%	-	-	-	55.8	258.2	67.6
9/2	Left	U	C2:A		1	33	-	831	1971	745	111.6%	-	-	-	57.9	250.7	70.5
10/1		U	-		-	-	-	880	1940	1940	35.8%	-	-	-	0.3	1.4	0.3
10/2		U	-		-	-	-	1194	2080	2080	43.1%	-	-	-	0.4	1.5	0.4
11/1		U	-		-	-	-	797	1940	1940	38.2%	-	-	-	0.3	1.5	0.3
11/2		U	-		-	-	-	210	2080	2080	8.9%	-	-	-	0.0	1.0	0.0
12/1	Ahead	U	C2:C		1	19	-	346	1940	431	80.3%	-	-	-	5.1	53.4	10.1
12/2	Ahead	U	C2:C		1	19	-	539	2080	462	116.6%	-	-	-	49.5	330.9	57.0
13/1	Right	U	C1:B		1	27	-	626	1848	575	77.9%	-	-	-	4.6	37.3	12.9
13/2	Right	U	C2:B		1	34	-	1055	1981	770	127.8%	-	-	-	125.1	457.5	144.3
14/1	Right	U	C2:D		2	40	-	524	1940	905	49.5%	-	-	-	1.2	9.5	2.3
14/2	Right	U	C2:D		2	40	-	692	2080	971	63.6%	-	-	-	1.9	11.1	3.8
15/1	Right Ahead	U	C1:B		1	27	-	515	1904	592	76.2%	-	-	-	3.7	29.8	12.4
15/2	Right Ahead	U	C1:B		1	27	-	549	2080	647	75.1%	-	-	-	4.8	35.6	12.4
19/1	Ahead	U	C1:I		1	75	-	797	1940	1638	45.3%	-	-	-	0.4	2.2	1.2
19/2	Ahead	U	C1:I		1	75	-	210	1940	1638	11.3%	-	-	-	0.1	1.3	0.1
Ped Link: P1	Unnamed Ped Link	-	C1:E		1	16	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P2	Unnamed Ped Link	-	C1:J		1	7	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P3	Unnamed Ped Link	-	C1:F		1	41	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P4	Unnamed Ped Link	-	C1:H		1	16	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P5	Unnamed Ped Link	-	C1:G		1	41	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P6	Unnamed Ped Link	-	C2:F		1	35	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P7	Unnamed Ped Link	-	C2:E		1	22	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P8	Unnamed Ped Link	-	C2:H		1	22	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P9	Unnamed Ped Link	-	C2:G		1	35	-	0	-	0	0.0%	-	-	-	-	-	-

C1 - West	Stream: 1 PRC for Signalled Lanes (%):	-96.7	Total Delay for Signalled Lanes (pcuHr):	309.90	Cycle Time (s): 90
C1 - West	Stream: 2 PRC for Signalled Lanes (%):	98.9	Total Delay for Signalled Lanes (pcuHr):	0.51	Cycle Time (s): 90
C2 - East	Stream: 1 PRC for Signalled Lanes (%):	-42.0	Total Delay for Signalled Lanes (pcuHr):	296.56	Cycle Time (s): 90
	PRC Over All Lanes (%):	-96.7	Total Delay Over All Lanes(pcuHr):	612.53	

Table 5b: Junction 5 (PM)

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: A473 A48 Waterton Rbt	-	-	-		-	-	-	-	-	-	**144.6%**	**0**	**0**	**0**	**532.5**	-	-
A473 A48 Waterton Rbt	-	-	-		-	-	-	-	-	-	**144.6%**	**0**	**0**	**0**	**532.5**	-	-
1/1	Ahead Left	U	C1:A		1	32	-	585	1928	707	82.8%	-	-	-	6.5	40.1	15.5
1/2	Ahead	U	C1:A		1	32	-	259	2080	763	34.0%	-	-	-	1.7	24.2	4.9
2/1	Ahead	U	C1:D		2	39	-	970	1830	834	101.8%	-	-	-	22.3	94.7	36.5
2/2	Ahead	U	C1:D		2	39	-	264	1962	894	29.5%	-	-	-	0.4	5.2	1.9
3/1	Ahead	U	-		-	-	-	482	1911	1911	23.6%	-	-	-	0.2	1.2	0.2
3/2	Ahead Ahead2	U	-		-	-	-	927	2043	2043	38.8%	-	-	-	0.3	1.4	0.3
3/3	Ahead	U	-		-	-	-	594	1990	1990	29.8%	-	-	-	0.2	1.3	0.2
4/1	Ahead	U	C1:C		1	19	-	439	1838	408	107.5%	-	-	-	25.9	212.0	32.3
4/2	Ahead	U	C1:C		1	19	-	330	1971	438	75.3%	-	-	-	4.5	48.9	9.2
5/1		U	-		-	-	-	180	1940	1940	7.4%	-	-	-	0.0	1.0	0.0
5/2		U	-		-	-	-	708	2080	2080	26.3%	-	-	-	0.2	1.2	0.2
6/1	Left Ahead	U	-		-	-	-	733	1852	1852	33.9%	-	-	-	0.3	1.5	0.3
6/2	Left Ahead	U	-		-	-	-	1269	1999	1999	58.2%	-	-	-	0.7	2.2	0.7
7/1		U	-		-	-	-	482	1940	1940	23.2%	-	-	-	0.2	1.2	0.2
7/2		U	-		-	-	-	825	2080	2080	33.4%	-	-	-	0.3	1.3	0.3
8/2+8/3	Right Ahead	U	-		-	-	-	1718	2029:1860	1206+754	69.1 : 66.2%	-	-	-	1.3	3.6	23.3
9/1	Left	U	C2:A		1	25	-	631	1838	531	118.8%	-	-	-	62.8	358.5	71.3
9/2	Left	U	C2:A		1	25	-	675	1971	569	118.5%	-	-	-	66.3	353.6	75.3
10/1		U	-		-	-	-	101	1940	1940	4.4%	-	-	-	0.0	1.0	0.0
10/2		U	-		-	-	-	589	2080	2080	27.9%	-	-	-	0.2	1.2	0.2
11/1		U	-		-	-	-	1416	1940	1940	55.2%	-	-	-	0.6	2.1	0.6
11/2		U	-		-	-	-	440	2080	2080	18.0%	-	-	-	0.1	1.1	0.1
12/1	Ahead	U	C2:C		1	27	-	873	1940	604	144.6%	-	-	-	156.1	643.5	168.2
12/2	Ahead	U	C2:C		1	27	-	936	2080	647	144.6%	-	-	-	167.2	643.1	180.3
13/1	Right	U	C1:B		1	34	-	102	1848	719	13.5%	-	-	-	0.2	7.9	0.8
13/2	Right	U	C2:B		1	42	-	594	1981	946	62.8%	-	-	-	2.4	14.5	8.5
14/1	Right	U	C2:D		2	32	-	632	1940	733	74.1%	-	-	-	3.1	20.5	6.1
14/2	Right	U	C2:D		2	32	-	680	2080	786	74.3%	-	-	-	3.0	18.8	5.7
15/1	Right Ahead	U	C1:B		1	34	-	617	1886	733	62.7%	-	-	-	2.1	16.7	7.8
15/2	Right Ahead	U	C1:B		1	34	-	661	2079	808	61.7%	-	-	-	2.2	16.2	8.0
19/1	Ahead	U	C1:I		1	75	-	1416	1940	1638	65.3%	-	-	-	1.0	3.3	12.3
19/2	Ahead	U	C1:I		1	75	-	440	1940	1638	22.8%	-	-	-	0.2	1.9	0.5
Ped Link: P1	Unnamed Ped Link	-	C1:E		1	23	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P2	Unnamed Ped Link	-	C1:J		1	7	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P3	Unnamed Ped Link	-	C1:F		1	34	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P4	Unnamed Ped Link	-	C1:H		1	23	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P5	Unnamed Ped Link	-	C1:G		1	34	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P6	Unnamed Ped Link	-	C2:F		1	27	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P7	Unnamed Ped Link	-	C2:E		1	30	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P8	Unnamed Ped Link	-	C2:H		1	30	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P9	Unnamed Ped Link	-	C2:G		1	27	-	0	-	0	0.0%	-	-	-	-	-	-

C1 - West	Stream: 1 PRC for Signalled Lanes (%):	-19.4	Total Delay for Signalled Lanes (pcuHr):	65.92	Cycle Time (s): 90
C1 - West	Stream: 2 PRC for Signalled Lanes (%):	37.8	Total Delay for Signalled Lanes (pcuHr):	1.18	Cycle Time (s): 90
C2 - East	Stream: 1 PRC for Signalled Lanes (%):	-60.7	Total Delay for Signalled Lanes (pcuHr):	460.90	Cycle Time (s): 90
	PRC Over All Lanes (%):	-60.7	Total Delay Over All Lanes(pcuHr):	532.52	

Junction 6, LINSIG

Table 6a: Junction 6 (AM)

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	-	-	-		-	-	-	-	-	-	**120.9%**	**674**	**0**	**0**	**469.7**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**120.9%**	**674**	**0**	**0**	**469.7**	-	-
1/1	Left	U	C2:C		1	32	-	800	1805	662	120.9%	-	-	-	85.0	382.6	97.9
1/2	Left	U	C2:C		1	32	-	858	1935	709	120.9%	-	-	-	91.2	382.5	105.0
2/1		U	-		-	-	-	467	1940	1940	22.7%	-	-	-	0.1	1.2	0.1
2/2		U	-		-	-	-	897	2080	2080	40.4%	-	-	-	0.3	1.5	0.3
3/2+3/1	Ahead	U	C1:A		1	43	-	1361	2046:1908	647+518	116.8 : 116.8%	-	-	-	117.3	310.3	137.4
3/3	Ahead	U	C1:A		1	43	-	604	2046	1000	60.4%	-	-	-	3.6	21.2	11.7
4/1	Ahead Ahead2	U	-		-	-	-	1249	1895	1895	58.3%	-	-	-	0.7	2.3	4.4
4/2	Ahead Ahead2	U	-		-	-	-	1500	2027	2027	66.7%	-	-	-	1.0	2.7	1.6
5/1	Right	U	C1:B		1	31	-	782	1883	670	99.2%	-	-	-	13.6	73.6	28.0
5/2	Right	U	C1:B		1	31	-	603	2019	718	71.1%	-	-	-	2.2	15.8	6.3
6/1	Ahead Left	U	-		-	-	-	1387	1899	1899	62.3%	-	-	-	0.8	2.5	0.8
6/2	Ahead	U	-		-	-	-	923	2039	2039	38.6%	-	-	-	0.3	1.4	0.3
6/3	Ahead	U	-		-	-	-	1040	2039	2039	47.8%	-	-	-	0.5	1.7	5.6
7/1	Ahead	U	C2:D		1	37	-	406	1940	819	42.4%	-	-	-	1.8	19.2	3.3
7/2	Ahead	U	C2:D		1	37	-	923	2080	878	89.6%	-	-	-	8.1	36.9	20.9
7/3	Ahead	U	C2:D		1	37	-	1040	2080	878	110.9%	-	-	-	61.6	227.8	79.4
8/1+8/2		U	-		-	-	-	981	1940:1940	1940+0	43.0 : 0.0%	-	-	-	0.4	1.6	0.4
9/1	Ahead	U	C2:D		1	37	-	75	1830	773	9.7%	-	-	-	0.4	18.3	1.2
9/2	Ahead	U	C2:D		1	37	-	407	1830	773	52.7%	-	-	-	2.7	24.2	8.0
10/1	Ahead	U	-		-	-	-	481	1940	1940	21.8%	-	-	-	0.2	1.4	3.5
10/2	Ahead Right	U	-		-	-	-	1330	2051	2051	58.2%	-	-	-	3.9	11.7	30.0

10/3	Ahead Right	U	-		-	-	-	1040	2080	2080	42.2%	-	-	-	0.4	1.5	6.1
11/1		U	-		-	-	-	481	1940	1940	21.8%	-	-	-	0.1	1.2	0.1
11/2		U	-		-	-	-	138	1940	1940	6.0%	-	-	-	0.0	1.0	0.0
11/3		U	-		-	-	-	1040	2080	2080	42.2%	-	-	-	0.4	1.5	0.4
12/1	Ahead Right	U	C2:B		1	48	-	1192	1915	1043	103.4%	-	-	-	32.6	108.9	56.2
12/2	Right	U	C2:B		1	48	-	0	2080	1132	0.0%	-	-	-	0.0	0.0	0.0
13/1	Left Ahead	U	C2:A		1	21	-	481	1940	474	101.4%	-	-	-	17.7	132.2	25.0
13/2	Ahead	U	C2:A		1	21	-	474	1940	474	100.0%	-	-	-	15.3	116.3	22.5
14/1		U	-		-	-	-	522	1940	1940	22.8%	-	-	-	0.1	1.2	0.1
15/1+15/2	Ahead	O	-		-	-	-	337	1870:2005	362+330	46.7 : 50.9%	674	0	0	1.3	14.4	2.6
16/1	Right	U	-		-	-	-	1151	1940	1940	55.4%	-	-	-	0.6	2.1	0.6
16/2	Right	U	-		-	-	-	474	2080	2080	22.8%	-	-	-	0.1	1.1	0.1
17/1		U	-		-	-	-	376	1940	1940	18.2%	-	-	-	0.1	1.1	0.1
17/2		U	-		-	-	-	495	2080	2080	21.5%	-	-	-	0.1	1.1	0.1
18/1	Left	U	-		-	-	-	376	1848	1848	19.1%	-	-	-	0.1	1.2	0.1
18/2	Left Ahead	U	-		-	-	-	944	1996	1996	44.6%	-	-	-	0.4	1.6	0.4
18/3	Ahead	U	-		-	-	-	642	2013	2013	31.9%	-	-	-	0.2	1.3	0.2
19/1	Ahead	U	C2:D		1	37	-	449	1911	807	54.9%	-	-	-	2.3	18.6	7.0
19/2	Ahead	U	C2:D		1	37	-	642	2049	865	74.2%	-	-	-	1.9	10.8	4.9
Ped Link: P1	Unnamed Ped Link	-	C2:F		1	21	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P2	Unnamed Ped Link	-	C2:E		1	26	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P3	Unnamed Ped Link	-	C1:H		1	35	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P4	Unnamed Ped Link	-	C1:G		1	45	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P5	Unnamed Ped Link	-	C1:F		1	45	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P6	Unnamed Ped Link	-	C1:E		1	35	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P7	Unnamed Ped Link	-	C2:H		1	32	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P8	Unnamed Ped Link	-	C2:G		1	22	-	0	-	0	0.0%	-	-	-	-	-	-

C1 - South Controller	Stream: 1 PRC for Signalled Lanes (%):	-29.8	Total Delay for Signalled Lanes (pcuHr):	136.69	Cycle Time (s): 90
C2 - North Controller	Stream: 1 PRC for Signalled Lanes (%):	-14.9	Total Delay for Signalled Lanes (pcuHr):	65.57	Cycle Time (s): 90
C2 - North Controller	Stream: 2 PRC for Signalled Lanes (%):	-34.4	Total Delay for Signalled Lanes (pcuHr):	255.08	Cycle Time (s): 90
	PRC Over All Lanes (%):	-34.4	Total Delay Over All Lanes(pcuHr):	469.72	

Table 6b: Junction 6 (PM)

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	-	-	-		-	-	-	-	-	-	**181.1%**	**1078**	**0**	**0**	**520.8**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**181.1%**	**1078**	**0**	**0**	**520.8**	-	-
1/1	Left	U	C2:C		1	26	-	404	1805	542	74.6%	-	-	-	4.6	41.2	10.5
1/2	Left	U	C2:C		1	26	-	440	1935	581	75.8%	-	-	-	5.0	41.1	11.4
2/1		U	-		-	-	-	701	1940	1940	28.3%	-	-	-	0.2	1.3	0.2
2/2		U	-		-	-	-	975	2080	2080	46.9%	-	-	-	0.4	1.6	0.4
3/2+3/1	Ahead	U	C1:A		1	48	-	1062	2046:1908	628+675	81.5 : 81.5%	-	-	-	6.1	20.8	16.0
3/3	Ahead	U	C1:A		1	48	-	397	2046	1114	35.6%	-	-	-	1.6	14.1	5.8
4/1	Ahead Ahead2	U	-		-	-	-	1061	1890	1890	48.0%	-	-	-	0.5	1.8	5.2
4/2	Ahead Ahead2	U	-		-	-	-	1313	2024	2024	64.9%	-	-	-	0.9	2.5	7.1
5/1	Right	U	C1:B		1	26	-	360	1883	565	63.2%	-	-	-	2.3	23.1	6.1
5/2	Right	U	C1:B		1	26	-	338	2019	606	55.8%	-	-	-	1.3	14.0	2.4
6/1	Ahead Left	U	-		-	-	-	910	1900	1900	47.7%	-	-	-	0.5	1.8	1.5
6/2	Ahead	U	-		-	-	-	566	2039	2039	27.8%	-	-	-	0.2	1.2	0.2
6/3	Ahead	U	-		-	-	-	681	2039	2039	33.4%	-	-	-	0.3	1.3	0.3
7/1	Ahead	U	C2:D		1	43	-	465	1940	948	49.0%	-	-	-	1.5	11.3	3.5
7/2	Ahead	U	C2:D		1	43	-	566	2080	1017	55.7%	-	-	-	1.8	11.5	3.9
7/3	Ahead	U	C2:D		1	43	-	681	2080	1017	67.0%	-	-	-	3.8	19.9	16.0
8/1+8/2		U	-		-	-	-	445	1940:1940	1940+0	22.8 : 0.0%	-	-	-	0.1	1.2	0.1
9/1	Ahead	U	C2:D		1	43	-	119	1830	895	13.3%	-	-	-	0.5	14.9	1.7
9/2	Ahead	U	C2:D		1	43	-	984	1830	895	110.0%	-	-	-	59.7	218.3	76.5
10/1	Ahead	U	-		-	-	-	584	1940	1940	30.1%	-	-	-	0.3	1.7	4.7
10/2	Ahead Right	U	-		-	-	-	1550	2049	2049	71.3%	-	-	-	5.7	14.0	37.2

10/3	Ahead Right	U	-		-	-	-	681	2080	2080	32.7%	-	-	-	0.2	1.3	0.2
11/1		U	-		-	-	-	584	1940	1940	30.1%	-	-	-	0.2	1.3	0.2
11/2		U	-		-	-	-	43	1940	1940	2.2%	-	-	-	0.0	0.9	0.0
11/3		U	-		-	-	-	681	2080	2080	32.7%	-	-	-	0.2	1.3	0.2
12/1	Ahead Right	U	C2:B		1	36	-	1507	1904	783	181.1%	-	-	-	360.5	915.4	385.5
12/2	Right	U	C2:B		1	36	-	0	2080	855	0.0%	-	-	-	0.0	0.0	0.0
13/1	Left Ahead	U	C2:A		1	33	-	647	1940	733	88.3%	-	-	-	8.2	45.5	18.6
13/2	Ahead	U	C2:A		1	33	-	648	1940	733	88.4%	-	-	-	8.2	45.7	18.6
14/1		U	-		-	-	-	197	1940	1940	6.9%	-	-	-	0.0	1.0	0.0
15/1+15/2	Ahead	O	-		-	-	-	572	1870:2005	314+204	110.5 : 110.5%	1078	0	0	36.0	226.5	55.7
16/1	Right	U	-		-	-	-	1957	1940	1940	66.8%	-	-	-	1.0	2.8	1.0
16/2	Right	U	-		-	-	-	648	2080	2080	31.2%	-	-	-	0.2	1.3	0.2
17/1		U	-		-	-	-	1018	1940	1940	35.1%	-	-	-	0.3	1.4	0.3
17/2		U	-		-	-	-	629	2080	2080	20.5%	-	-	-	0.1	1.1	0.1
18/1	Left	U	-		-	-	-	1018	1848	1848	36.8%	-	-	-	0.3	1.5	0.3
18/2	Left Ahead	U	-		-	-	-	1286	1997	1997	46.6%	-	-	-	0.4	1.7	0.4
18/3	Ahead	U	-		-	-	-	873	2013	2013	43.4%	-	-	-	0.4	1.6	0.4
19/1	Ahead	U	C2:D		1	43	-	657	1911	934	53.8%	-	-	-	2.4	17.4	8.2
19/2	Ahead	U	C2:D		1	43	-	873	2049	1002	87.1%	-	-	-	4.8	19.7	10.7
Ped Link: P1	Unnamed Ped Link	-	C2:F		1	33	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P2	Unnamed Ped Link	-	C2:E		1	14	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P3	Unnamed Ped Link	-	C1:H		1	30	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P4	Unnamed Ped Link	-	C1:G		1	50	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P5	Unnamed Ped Link	-	C1:F		1	50	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P6	Unnamed Ped Link	-	C1:E		1	30	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P7	Unnamed Ped Link	-	C2:H		1	26	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P8	Unnamed Ped Link	-	C2:G		1	25	-	0	-	0	0.0%	-	-	-	-	-	-

C1 - South Controller	Stream: 1 PRC for Signalled Lanes (%):	10.4	Total Delay for Signalled Lanes (pcuHr):	11.31	Cycle Time (s): 90
C2 - North Controller	Stream: 1 PRC for Signalled Lanes (%):	-101.2	Total Delay for Signalled Lanes (pcuHr):	376.89	Cycle Time (s): 90
C2 - North Controller	Stream: 2 PRC for Signalled Lanes (%):	-22.2	Total Delay for Signalled Lanes (pcuHr):	84.05	Cycle Time (s): 90
	PRC Over All Lanes (%):	-101.2	Total Delay Over All Lanes(pcuHr):	520.75	

Junction 7, Arcady 9 – Roundabout Module

Table 7: Summary of Junction Performance, Junction 7

	AM									PM								
	Set ID	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity	Set ID	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity
	2020																	
Arm B	D1	19.0	69.5	78.00	0.99	F	17.78	C	-4 % [Arm B]	D2	1.4	1.8	6.35	0.58	A	13.12	B	-1 % [Arm C]
Arm C		3.7	16.7	14.32	0.80	B					13.5	70.1	36.88	0.95	E			
Arm D		0.5	2.4	2.19	0.35	A					1.5	1.9	4.22	0.60	A			
Arm E		0.4	1.3	6.24	0.29	A					1.5	7.5	22.61	0.60	C			
Arm A		2.4	5.5	3.63	0.70	A					1.2	1.6	2.50	0.55	A			

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 8, LINSIG

Table 8a: Junction 8 (AM)

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	-	-	-		-	-	-	-	-	-	**84.8%**	**0**	**0**	**0**	**45.3**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**84.8%**	**0**	**0**	**0**	**45.3**	-	-
1/1	Right Ahead	U	A		1	31	-	513	1940	690	74.4%	-	-	-	5.0	35.4	12.5
1/2	Right Right2	U	A		1	31	-	531	2080	740	71.8%	-	-	-	5.0	33.6	12.6
2/1		U	-		-	-	-	235	1940	1940	12.1%	-	-	-	0.1	1.1	0.1
2/2		U	-		-	-	-	635	2080	2080	30.5%	-	-	-	0.2	1.2	0.2
3/1	Left	U	C		1	11	-	175	1732	231	75.8%	-	-	-	3.3	68.2	5.7
3/2	Ahead	U	C		1	11	-	160	1940	259	61.9%	-	-	-	2.4	54.8	4.6
3/3	Ahead	U	C		1	11	-	173	2080	277	62.4%	-	-	-	2.6	53.9	4.9
4/2+4/1		U	-		-	-	-	782	1940:1940	1940	40.3%	-	-	-	0.3	1.6	0.3
5/1		U	-		-	-	-	426	1940	1940	22.0%	-	-	-	0.1	1.2	0.1
5/2		U	-		-	-	-	814	2080	2080	39.1%	-	-	-	0.3	1.4	0.3
6/1	Left Ahead	U	B		1	34	-	444	1897	738	60.2%	-	-	-	3.5	28.0	9.5
6/2	Ahead	U	B		1	34	-	439	1940	754	58.2%	-	-	-	3.3	27.4	9.4
6/3+6/4	Ahead	U	B		1	34	-	418	2080:2080	910	45.9%	-	-	-	2.6	22.5	5.2
7/2+7/1	Left	U	D		1	19	-	460	1935:1805	543	84.8%	-	-	-	6.7	52.1	10.0
8/1		U	-		-	-	-	421	1940	1940	21.7%	-	-	-	0.1	1.2	0.1
9/1	Ahead	U	E		1	47	-	375	1940	1035	36.2%	-	-	-	1.7	16.5	4.9
9/2	Ahead	U	E		1	47	-	690	2080	1109	62.2%	-	-	-	1.5	8.0	5.2
10/1	Ahead Right	U	-		-	-	-	160	1939	1939	8.3%	-	-	-	0.0	1.0	0.0
10/2	Right	U	-		-	-	-	173	1972	1972	8.8%	-	-	-	0.0	1.0	1.7
11/1	Ahead	U	-		-	-	-	235	1940	1940	12.1%	-	-	-	0.1	1.1	0.1
11/2	Ahead	U	-		-	-	-	635	2080	2080	30.5%	-	-	-	0.2	1.2	0.2
11/3	Right	U	-		-	-	-	458	1935	1935	23.7%	-	-	-	0.2	1.2	3.4
11/4	Right	U	-		-	-	-	374	1935	1935	19.3%	-	-	-	0.1	1.2	1.2
12/1	Right	U	H		1	46	-	458	1911	998	45.9%	-	-	-	2.8	22.1	7.2
12/2	Right Right2	U	H		1	46	-	374	1995	1042	35.9%	-	-	-	1.8	17.3	4.8
13/1	Right	U	G		1	22	-	29	1856	474	6.1%	-	-	-	0.4	50.0	0.8
14/1	Ahead	U	O		1	81	-	782	1830	1667	46.9%	-	-	-	0.5	2.1	5.6
15/1	Ahead	U	M		1	81	-	235	1940	1768	13.3%	-	-	-	0.1	1.2	0.1
15/2	Ahead	U	M		1	81	-	635	2080	1895	33.5%	-	-	-	0.3	1.4	0.3

C1	Stream: 1 PRC for Signalled Lanes (%):	6.2	Total Delay for Signalled Lanes (pcuHr):	42.68	Cycle Time (s): 90
C1	Stream: 2 PRC for Signalled Lanes (%):	168.6	Total Delay for Signalled Lanes (pcuHr):	0.33	Cycle Time (s): 90
C1	Stream: 3 PRC for Signalled Lanes (%):	91.9	Total Delay for Signalled Lanes (pcuHr):	0.45	Cycle Time (s): 90
C1	Stream: 4 PRC for Signalled Lanes (%):	0.0	Total Delay for Signalled Lanes (pcuHr):	0.00	Cycle Time (s): 90
	PRC Over All Lanes (%):	6.2	Total Delay Over All Lanes(pcuHr):	45.35	

Table 8b: Junction 8 (PM)

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	**80.2%**	**0**	**0**	**0**	**45.4**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**80.2%**	**0**	**0**	**0**	**45.4**	-	-
1/1	Right Ahead	U	A		1	30	-	447	1940	668	66.9%	-	-	-	4.1	33.2	10.4
1/2	Right Right2	U	A		1	30	-	458	2080	716	63.9%	-	-	-	4.0	31.7	10.4
2/1		U	-		-	-	-	244	1940	1940	12.6%	-	-	-	0.1	1.1	0.1
2/2		U	-		-	-	-	690	2080	2080	33.2%	-	-	-	0.2	1.3	0.2
3/1	Left	U	C		1	14	-	215	1732	289	74.5%	-	-	-	3.5	59.2	6.5
3/2	Ahead	U	C		1	14	-	222	1940	323	68.7%	-	-	-	3.2	52.7	6.3
3/3	Ahead	U	C		1	14	-	239	2080	347	68.9%	-	-	-	3.4	51.7	6.7
4/2+4/1		U	-		-	-	-	478	1940:1940	1940	24.6%	-	-	-	0.2	1.2	0.2
5/1		U	-		-	-	-	528	1940	1940	27.2%	-	-	-	0.2	1.3	0.2
5/2		U	-		-	-	-	842	2080	2080	40.5%	-	-	-	0.3	1.5	0.3
6/1	Left Ahead	U	B		1	33	-	439	1896	716	61.3%	-	-	-	3.6	29.1	9.6
6/2	Ahead	U	B		1	33	-	431	1940	733	58.8%	-	-	-	3.4	28.3	9.2
6/3+6/4	Ahead	U	B		1	33	-	409	2080:2080	878	46.6%	-	-	-	2.7	23.4	5.4
7/2+7/1	Left	U	D		1	17	-	391	1935:1805	488	80.2%	-	-	-	5.5	50.7	8.6
8/1		U	-		-	-	-	469	1940	1940	24.2%	-	-	-	0.2	1.2	0.2
9/1	Ahead	U	E		1	44	-	478	1940	970	49.3%	-	-	-	2.5	18.6	7.0
9/2	Ahead	U	E		1	44	-	677	2080	1040	65.1%	-	-	-	2.3	12.4	7.3
10/1	Ahead Right	U	-		-	-	-	222	1931	1931	11.5%	-	-	-	0.1	1.1	0.6
10/2	Right	U	-		-	-	-	239	1972	1972	12.1%	-	-	-	0.1	1.1	3.4
11/1	Ahead	U	-		-	-	-	244	1940	1940	12.6%	-	-	-	0.1	1.1	0.1
11/2	Ahead	U	-		-	-	-	690	2080	2080	33.2%	-	-	-	0.2	1.3	0.2
11/3	Right	U	-		-	-	-	255	1935	1935	13.2%	-	-	-	0.1	1.1	1.2
11/4	Right	U	-		-	-	-	501	1935	1935	25.9%	-	-	-	0.2	1.3	3.4
12/1	Right	U	H		1	47	-	255	1911	1019	25.0%	-	-	-	1.5	20.8	4.2
12/2	Right Right2	U	H		1	47	-	501	1994	1063	47.1%	-	-	-	2.8	20.3	7.4
13/1	Right	U	G		1	20	-	28	1856	433	6.5%	-	-	-	0.4	48.0	0.7
14/1	Ahead	U	O		1	81	-	478	1830	1667	28.7%	-	-	-	0.2	1.5	2.3
15/1	Ahead	U	M		1	81	-	244	1940	1768	13.8%	-	-	-	0.1	1.2	0.1
15/2	Ahead	U	M		1	81	-	690	2080	1895	36.4%	-	-	-	0.3	1.5	0.3

C1	Stream: 1 PRC for Signalled Lanes (%):	12.3	Total Delay for Signalled Lanes (pcuHr):	42.98	Cycle Time (s):	90
C1	Stream: 2 PRC for Signalled Lanes (%):	147.2	Total Delay for Signalled Lanes (pcuHr):	0.37	Cycle Time (s):	90
C1	Stream: 3 PRC for Signalled Lanes (%):	213.9	Total Delay for Signalled Lanes (pcuHr):	0.20	Cycle Time (s):	90
C1	Stream: 4 PRC for Signalled Lanes (%):	0.0	Total Delay for Signalled Lanes (pcuHr):	0.00	Cycle Time (s):	90
	PRC Over All Lanes (%):	12.3	Total Delay Over All Lanes(pcuHr):	45.43		

Junction 9, Arcady 9 – Roundabout Module

Table 9: Summary of Junction Performance, Junction 9

	AM									PM								
	Set ID	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity	Set ID	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity
	2020																	
Arm 1	D1	2.7	6.2	8.57	0.74	A	18.43	C	-2 % [Arm 3]	D2	3.6	11.9	8.52	0.78	A	6.63	A	16 % [Arm 1]
Arm 2		1.7	3.1	3.68	0.63	A					2.6	5.5	5.09	0.72	A			
Arm 3		16.1	75.8	45.93	0.97	E					1.6	1.8	6.58	0.62	A			

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 10, LINSIG

Table 10a: Junction 10 (AM)

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	-	-	-		-	-	-	-	-	-	**188.9%**	**5**	**108**	**0**	**412.8**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**188.9%**	**5**	**108**	**0**	**412.8**	-	-
1/1	Ahead Left	U	A		1	49	-	1070	1926	1070	100.0%	-	-	-	22.3	75.0	42.8
1/2+1/3	Right Ahead	U	A B		1	49:24	-	609	2080:1902	560	108.8%	-	-	-	36.9	218.0	46.4
3/1+3/2	Left Right Ahead	U	E	F	1	21:10	11	1087	1746:1951	575	188.9%	-	-	-	289.9	960.3	301.7
5/1	Ahead Left	U	C		1	20	-	466	1846	431	108.2%	-	-	-	28.8	222.4	35.3
5/2	Ahead	U	C		1	20	-	525	2080	485	108.2%	-	-	-	31.9	218.5	39.2
7/1+7/2	Right Ahead	U	D		1	10	-	171	1904:1848	328	52.1%	-	-	-	2.2	45.7	3.1
8/1	Ahead	U	O		1	71	-	157	1940	1552	8.8%	-	-	-	0.1	2.0	0.6
10/1	Left	O	-		-	-	-	113	1764	573	19.7%	5	108	0	0.5	17.5	1.8
11/1	Ahead	U	O		1	71	-	284	1940	1552	18.3%	-	-	-	0.3	3.5	1.8

C1 Stream: 1 PRC for Signalled Lanes (%): -109.9 — Total Delay for Signalled Lanes (pcuHr): 411.94 — Cycle Time (s): 90
C1 Stream: 2 PRC for Signalled Lanes (%): 391.8 — Total Delay for Signalled Lanes (pcuHr): 0.35 — Cycle Time (s): 90
PRC Over All Lanes (%): -109.9 — Total Delay Over All Lanes(pcuHr): 412.84

Table 10b: Junction 10 (PM)

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	-	-	-		-	-	-	-	-	-	**194.6%**	**3**	**141**	**0**	**573.7**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**194.6%**	**3**	**141**	**0**	**573.7**	-	-
1/1	Ahead Left	U	A		1	49	-	760	1925	1069	71.1%	-	-	-	4.3	20.5	15.2
1/2+1/3	Right Ahead	U	A B		1	49:20	-	779	2080:1902	444	175.5%	-	-	-	189.4	875.5	198.5
3/1+3/2	Left Right Ahead	U	E	F	1	17:10	7	984	1746:1957	506	194.6%	-	-	-	271.1	992.0	280.9
5/1	Ahead Left	U	C		1	24	-	585	1842	512	114.3%	-	-	-	48.8	300.3	56.8
5/2	Ahead	U	C		1	24	-	661	2080	578	114.4%	-	-	-	54.9	298.9	63.9
7/1+7/2	Right Ahead	U	D		1	10	-	261	1904:1848	356	73.3%	-	-	-	3.9	53.5	4.9
8/1	Ahead	U	O		1	71	-	140	1940	1552	7.3%	-	-	-	0.1	2.6	0.5
10/1	Left	O	-		-	-	-	144	1764	575	25.0%	3	141	0	0.8	19.0	2.0
11/1	Ahead	U	O		1	71	-	405	1940	1552	26.1%	-	-	-	0.4	3.8	2.7

C1 Stream: 1 PRC for Signalled Lanes (%): -116.2 — Total Delay for Signalled Lanes (pcuHr): 572.45 — Cycle Time (s): 90
C1 Stream: 2 PRC for Signalled Lanes (%): 244.9 — Total Delay for Signalled Lanes (pcuHr): 0.52 — Cycle Time (s): 90
PRC Over All Lanes (%): -116.2 — Total Delay Over All Lanes(pcuHr): 573.73

Junction 11, PICADY 9 – Priority Intersection Module

Table 11: Summary of Junction Performance, Junction 11

	AM									PM							
	Set ID	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity	Set ID	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity
	2020																	
Stream B-AC	D1	0.4	1.1	18.80	0.28	C	2.87	A	6 %	D2	**0.8**	**3.8**	**25.44**	**0.45**	D	**1.84**	A	3 %
Stream C-AB		5.5	26.5	8.33	0.67	A			[Stream C-AB]		**2.3**	**10.3**	**5.06**	**0.40**	A			[Stream B-AC]

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 12, PICADY 9 – Priority Intersection Module

Table 12: Summary of Junction Performance, Junction 12

	AM						PM					
	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020											
Stream B-ACD	D1	0.0	0.00	0.00	A	8 % [Stream D-ABC]	D2	0.0	0.00	0.00	A	-9 % [Stream A-BCD]
Stream A-BCD		5.1	12.50	0.71	B			57.0	131.77	1.05	F	
Stream D-ABC		1.7	24.97	0.64	C			0.7	17.73	0.41	C	
Stream C-ABD		0.0	0.00	0.00	A			0.0	0.00	0.00	A	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 13, PICADY 9 – Priority Intersection Module

Table 13: Summary of Junction Performance, Junction 13

	AM						PM					
	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020											
Stream B-AC	D1	9.1	84.80	0.94	F	-12 % [Stream B-AC]	D2	4.4	60.84	0.86	F	-28 % [Stream C-AB]
Stream C-AB		3.4	13.13	0.67	B			177.3	679.57	1.32	F	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 14. ARCADY 9 – Roundabout Module

Table 54: Summary of Junction Performance, Junction 14

	AM						PM					
	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020											
Arm 1	D1	191.1	225.32	1.13	F	-14 % [Arm 1]	D2	3.6	5.95	0.79	A	-32 % [Arm 4]
Arm 2		3.2	5.95	0.77	A			90.9	105.20	1.06	F	
Arm 3		0.0	4.82	0.05	A			0.6	11.74	0.38	B	
Arm 4		2.3	38.52	0.72	E			303.4	3332.50	13.56	F	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 15. ARCADY 9 – Roundabout Module

Table 15: Summary of Junction Performance, Junction 15

	AM						PM					
	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020											
Arm 1	D1	1.5	3.76	0.60	A	-30 % [Arm 4]	D2	5.8	10.12	0.86	B	-4 % [Arm 4]
Arm 2		1.2	7.62	0.55	A			7.3	45.32	0.90	E	
Arm 3		0.3	7.25	0.21	A			0.4	20.28	0.31	C	
Arm 4		588.2	946.95	1.40	F			35.6	55.58	1.00	F	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 16, LINSIG

Table 16a: Junction 16 (AM)

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	-	-	-		-	-	-	-	-	-	**256.9%**	**0**	**0**	**0**	**376.7**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**256.9%**	**0**	**0**	**0**	**376.7**	-	-
1/1	Left Ahead Right	U	E		1	9	-	537	1881	209	256.9%	-	-	-	186.3	1249.3	191.2
2/1		U	-		-	-	-	485	1940	1940	18.7%	-	-	-	0.1	1.1	0.1
4/1+4/2	Right Left Ahead	U	C D		1	22:12	-	604	1887:1891	538	112.2%	-	-	-	45.1	269.0	51.9
6/2+6/1	Ahead Right Left	U	F		1	18	-	692	2030:1687	454	152.3%	-	-	-	139.0	723.2	147.6
8/1+8/2	Left Ahead Right	U	A B		1	22:12	-	489	1911:1920	627	78.0%	-	-	-	6.1	44.7	10.5
			C1		PRC for Signalled Lanes (%): -185.5 PRC Over All Lanes (%): -185.5				Total Delay for Signalled Lanes (pcuHr): 376.56 Total Delay Over All Lanes(pcuHr): 376.67			Cycle Time (s): 90					

Table 16b: Junction 16 (PM)

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	-	-	-		-	-	-	-	-	-	**183.2%**	**0**	**0**	**0**	**268.1**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**183.2%**	**0**	**0**	**0**	**268.1**	-	-
1/1	Left Ahead Right	U	E		1	9	-	345	1845	205	168.3%	-	-	-	81.4	849.4	85.4
2/1		U	-		-	-	-	435	1940	1940	17.3%	-	-	-	0.1	1.1	0.1
4/1+4/2	Right Left Ahead	U	C D		1	30:12	-	771	1876:1891	721	106.9%	-	-	-	39.5	184.6	51.3
6/2+6/1	Ahead Right Left	U	F		1	10	-	528	2018:1687	288	183.2%	-	-	-	138.6	944.8	144.3
8/1+8/2	Left Ahead Right	U	A B		1	30:12	-	674	1899:1920	777	86.7%	-	-	-	8.5	45.1	16.0
			C1		PRC for Signalled Lanes (%): -103.6 PRC Over All Lanes (%): -103.6				Total Delay for Signalled Lanes (pcuHr): 267.97 Total Delay Over All Lanes(pcuHr): 268.08			Cycle Time (s): 90					

Junction 17

Table 17a: Junction 17 (AM)

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	-	-	-		-	-	-	-	-	-	**111.4%**	**0**	**0**	**0**	**97.7**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**111.4%**	**0**	**0**	**0**	**97.7**	-	-
1/1	Ahead Left	U	A		1	45	-	384	1856	949	40.5%	-	-	-	1.8	16.8	6.2
1/2	Ahead	U	A		1	45	-	445	2080	1063	41.9%	-	-	-	2.1	16.6	7.2
1/3	Right	U	B		1	15	-	102	1981	352	29.0%	-	-	-	1.1	39.3	2.4
2/1	Ahead Left	U	E		1	13	-	322	1859	289	111.4%	-	-	-	25.4	284.5	29.8
2/2	Right	U	E		1	13	-	169	1857	289	58.5%	-	-	-	2.4	50.2	4.6
3/1	Left Ahead	U	C		1	43	-	977	1925	941	103.8%	-	-	-	34.7	127.9	52.3
3/2	Right	U	D		1	15	-	394	1995	355	111.1%	-	-	-	29.1	265.9	34.6
4/1		U	-		-	-	-	266	1940	1940	13.1%	-	-	-	0.1	1.1	0.1
5/1		U	-		-	-	-	1071	1940	1940	53.5%	-	-	-	0.6	2.0	0.6
6/1		U	-		-	-	-	222	1940	1940	11.4%	-	-	-	0.1	1.0	0.1
6/2		U	-		-	-	-	666	2080	2080	30.9%	-	-	-	0.2	1.3	0.2
7/1		U	-		-	-	-	568	1940	1940	27.3%	-	-	-	0.2	1.3	0.2
			C1		PRC for Signalled Lanes (%): -23.7 PRC Over All Lanes (%): -23.7				Total Delay for Signalled Lanes (pcuHr): 96.57 Total Delay Over All Lanes(pcuHr): 97.70			Cycle Time (s): 90					

Table 17b: Junction 17 (PM)

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%	0	0	0	28.2	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	86.0%	0	0	0	28.2	-	-
1/1	Ahead Left	U	A		1	43	-	546	1902	930	58.7%	-	-	-	3.2	21.2	10.4
1/2	Ahead	U	A		1	43	-	613	2080	1017	60.3%	-	-	-	3.6	21.1	11.8
1/3	Right	U	B		1	16	-	81	1981	374	21.6%	-	-	-	0.8	37.0	1.8
2/1	Ahead Left	U	E		1	14	-	261	1858	310	84.3%	-	-	-	5.1	70.0	8.7
2/2	Right	U	E		1	14	-	115	1857	309	37.2%	-	-	-	1.4	42.5	2.8
3/1	Left Ahead	U	C		1	41	-	761	1921	896	84.9%	-	-	-	7.2	34.0	19.4
3/2	Right	U	D		1	16	-	324	1995	377	86.0%	-	-	-	6.0	66.2	10.6
4/1		U	-		-	-	-	224	1940	1940	11.5%	-	-	-	0.1	1.0	0.1
5/1		U	-		-	-	-	802	1940	1940	41.3%	-	-	-	0.4	1.6	0.4
6/1		U	-		-	-	-	513	1940	1940	26.4%	-	-	-	0.2	1.3	0.2
6/2		U	-		-	-	-	729	2080	2080	35.0%	-	-	-	0.3	1.3	0.3
7/1		U	-		-	-	-	433	1940	1940	22.3%	-	-	-	0.1	1.2	0.1

C1 PRC for Signalled Lanes (%): 4.7 Total Delay for Signalled Lanes (pcuHr): 27.21 Cycle Time (s): 90
PRC Over All Lanes (%): 4.7 Total Delay Over All Lanes(pcuHr): 28.22

Junction 18. ARCADY 9 – Roundabout Module

Table 18: Summary of Junction Performance, Junction 18

	AM						PM					
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020											
Arm 1	D1	87.3	419.01	1.19	F	-55 %	D2	1.5	9.86	0.60	A	-32 %
Arm 2		1.7	6.39	0.62	A			416.5	921.58	1.39	F	
Arm 3		912.6	3725.45	2.15	F	[Arm 3]		116.8	638.08	1.28	F	[Arm 3]

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 19. ARCADY 9 – Roundabout Module

Table 19: Summary of Junction Performance, Junction 19

	AM						PM					
	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020											
Arm 1	D1	0.0	2.66	0.02	A	41 %	D2	0.0	3.33	0.02	A	80 %
Arm 2		0.9	4.91	0.48	A			0.6	4.71	0.36	A	
Arm 3		2.1	5.67	0.68	A	[Arm 3]		0.4	2.41	0.30	A	[Arm 2]
Arm 4		0.1	2.22	0.09	A			0.6	3.11	0.39	A	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 20, PICADY 9 – Priority Intersection Module

Table 20: Summary of Junction Performance, Junction 20

	AM						PM					
	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020											
Stream B-AC	D1	0.7	17.01	0.41	C	29 %	D2	0.3	10.83	0.25	B	76 %
Stream C-AB		0.0	7.15	0.03	A	[Stream B-AC]		0.0	6.39	0.05	A	[Stream B-AC]

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 21. ARCADY 9 – Roundabout Module

Table 21: Summary of Junction Performance, Junction 21

	AM						PM					
	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020											
Arm 1	D1	2.6	8.31	0.73	A	19 %	D2	1.1	4.50	0.53	A	34 %
Arm 2		1.3	3.79	0.56	A			1.2	3.35	0.54	A	
Arm 3		1.7	4.21	0.64	A	[Arm 1]		2.1	4.84	0.67	A	[Arm 3]
Arm 4		0.4	3.31	0.31	A			0.3	2.79	0.21	A	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met

Junction 22, LINSIG

Table 22a: Junction 22 (AM)

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	-	-	-		-	-	-	-	-	-	407.5%	0	175	0	583.5	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	407.5%	0	175	0	583.5	-	-
1/1	Left Ahead	U	B		1	11	-	1053	1938	258	407.5%	-	-	-	449.2	1535.6	458.5
1/2	Right	U	C		1	11	-	258	1891	252	102.3%	-	-	-	12.6	176.0	16.2
2/1		U	-		-	-	-	1015	1940	1940	50.2%	-	-	-	0.5	1.9	0.5
2/2		U	-		-	-	-	855	1940	1940	41.3%	-	-	-	0.4	1.6	0.4
3/2+3/1	Right Left Ahead	U	D M		1	10:50	-	171	2047:1860	379	45.2%	-	-	-	1.7	34.8	3.0
4/1	Ahead	U	N		1	76	-	216	1940	1660	11.8%	-	-	-	0.1	1.2	0.1
5/2+5/1	Ahead Left	U+O	E -		1	35	-	838	1940:1764	785	106.7%	0	175	0	41.1	176.5	86.0
5/3+5/4	Ahead Right	U	E		1	35	-	915	2080:1891	855	107.0%	-	-	-	45.7	179.9	60.7
7/2+7/1	Left Ahead	U	A L		1	7:21	-	477	2080:1774	530	89.9%	-	-	-	8.4	63.5	13.1
7/3	Right	U	A		1	7	-	201	1872	166	120.8%	-	-	-	23.6	422.2	26.2
8/1		U	-		-	-	-	534	1940	1940	26.6%	-	-	-	0.2	1.3	0.2
9/1	Ahead	U	N		1	76	-	171	1940	1660	10.3%	-	-	-	0.1	2.2	0.7
10/1		U	-		-	-	-	216	1940	1940	10.1%	-	-	-	0.1	1.0	0.1

C1 Stream: 1 PRC for Signalled Lanes (%): -352.8 Total Delay for Signalled Lanes (pcuHr): 582.25 Cycle Time (s): 90
C1 Stream: 2 PRC for Signalled Lanes (%): 661.5 Total Delay for Signalled Lanes (pcuHr): 0.17 Cycle Time (s): 90
PRC Over All Lanes (%): -352.8 Total Delay Over All Lanes(pcuHr): 583.51

Table 22b: Junction 22 (PM)

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	-	-	-		-	-	-	-	-	-	394.4%	12	181	0	717.9	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	394.4%	12	181	0	717.9	-	-
1/1	Left Ahead	U	B		1	17	-	1528	1937	387	394.4%	-	-	-	644.2	1517.9	658.1
1/2	Right	U	C		1	17	-	303	1891	378	80.1%	-	-	-	4.8	57.1	9.1
2/1		U	-		-	-	-	698	1940	1940	36.0%	-	-	-	0.3	1.4	0.3
2/2		U	-		-	-	-	659	1940	1940	33.6%	-	-	-	0.3	1.4	0.3
3/2+3/1	Right Left Ahead	U	D M		1	10:44	-	253	2053:1860	488	51.8%	-	-	-	2.2	31.4	3.6
4/1	Ahead	U	N		1	76	-	186	1940	1660	9.8%	-	-	-	0.1	1.2	0.1
5/2+5/1	Ahead Left	U+O	E -		1	29	-	661	1940:1764	663	99.7%	12	181	0	17.4	95.0	28.3
5/3+5/4	Ahead Right	U	E		1	29	-	728	2080:1891	720	101.1%	-	-	-	22.0	108.6	33.8
7/2+7/1	Left Ahead	U	A L		1	7:27	-	293	2080:1774	642	45.7%	-	-	-	2.7	32.7	5.0
7/3	Right	U	A		1	7	-	201	1872	166	120.8%	-	-	-	23.6	422.2	26.2
8/1		U	-		-	-	-	603	1940	1940	31.1%	-	-	-	0.2	1.3	0.2
9/1	Ahead	U	N		1	76	-	253	1940	1660	15.2%	-	-	-	0.2	2.4	1.1
10/1		U	-		-	-	-	186	1940	1940	8.3%	-	-	-	0.0	1.0	0.0

C1 Stream: 1 PRC for Signalled Lanes (%): -338.2 Total Delay for Signalled Lanes (pcuHr): 716.90 Cycle Time (s): 90
C1 Stream: 2 PRC for Signalled Lanes (%): 490.4 Total Delay for Signalled Lanes (pcuHr): 0.22 Cycle Time (s): 90
PRC Over All Lanes (%): -338.2 Total Delay Over All Lanes(pcuHr): 717.93

Junction 23. ARCADY 9 – Roundabout Module

Table 23: Summary of Junction Performance, Junction 23

	AM						PM					
	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020											
Arm 1	D1	325.5	701.72	1.37	F	-24 % [Arm 1]	D2	7.6	19.33	0.89	C	-19 % [Arm 3]
Arm 2		3.1	6.92	0.76	A			3.6	6.96	0.79	A	
Arm 3		5.5	20.60	0.86	C			202.4	583.30	1.40	F	
Arm 4		10.3	74.50	0.95	F			15.3	134.77	1.01	F	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met

Junction 24. PICADY 9 – Priority Intersection Module

Table 24: Summary of Junction Performance, Junction 24

	AM						PM					
	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020											
Stream B-AC	D1	255.0	59999940.00	9999999999.00	F	-30 % [Stream C-AB]	D2	104.4	1378.04	9999999999.00	F	-20 % [Stream B-AC]
Stream C-AB		344.5	970.89	1.43	F			81.2	225.77	1.13	F	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 25. PICADY 9 – Priority Intersection Module

Table 25: Summary of Junction Performance, Junction 25

	AM						PM					
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020											
Stream B-AC	D1	0.1	7.96	0.10	A	70 %	D2	0.4	11.00	0.29	B	81 %
Stream C-AB		0.8	5.35	0.29	A	[Stream C-AB]		0.3	5.69	0.14	A	[Stream B-AC]

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 26. PICADY 9 – Priority Intersection Module

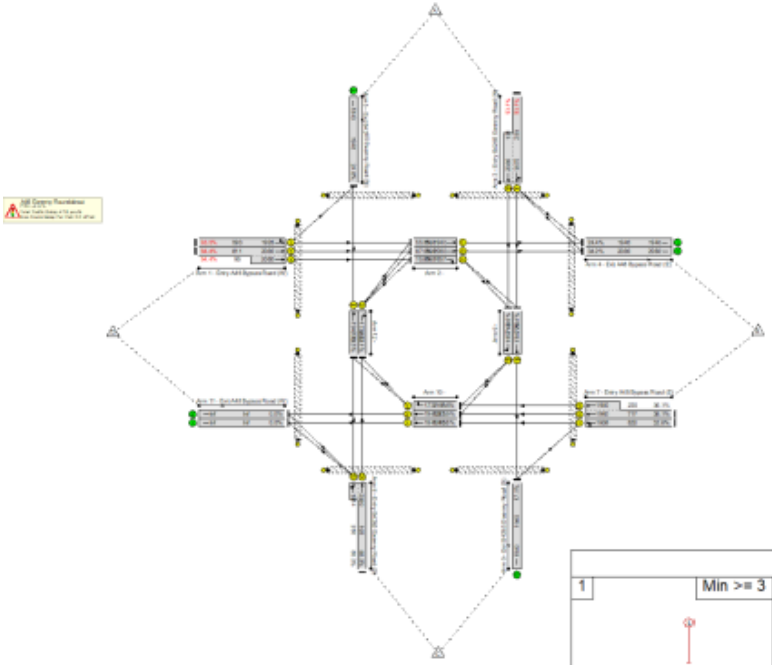
Table 26: Summary of Junction Performance, Junction 26.

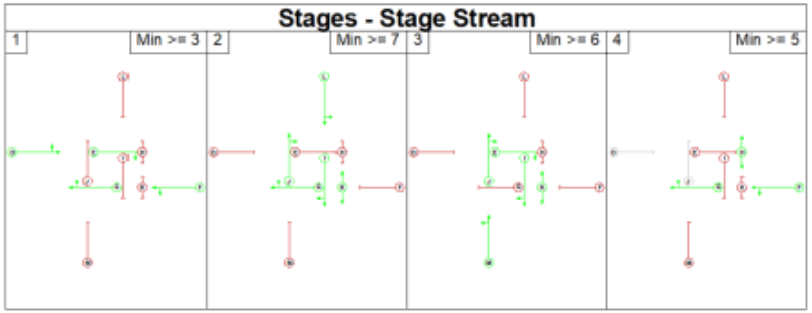
	AM						PM					
	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020											
Stream B-ACD	D1	0.2	9.77	0.18	A	-4 %	D2	0.3	11.34	0.22	B	6 %
Stream A-BCD		0.2	4.85	0.09	A			0.2	5.60	0.10	A	
Stream D-AB		0.2	15.62	0.14	C	[Stream D-BC]		0.2	12.30	0.18	B	[Stream D-BC]
Stream D-BC		3.7	42.78	0.81	E			1.8	27.22	0.65	D	
Stream C-ABD		0.3	5.19	0.12	A			0.5	4.37	0.18	A	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Network Diagrams for LINSIG Models of Signalised Junctions

Figure A: Network Layout Diagram, Junction 4





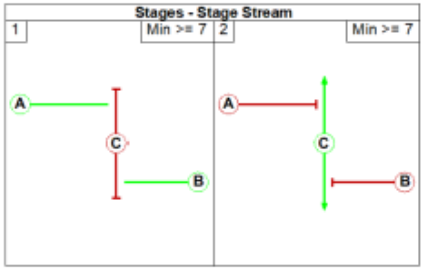


Figure B: Network Layout Diagram, Junction 5

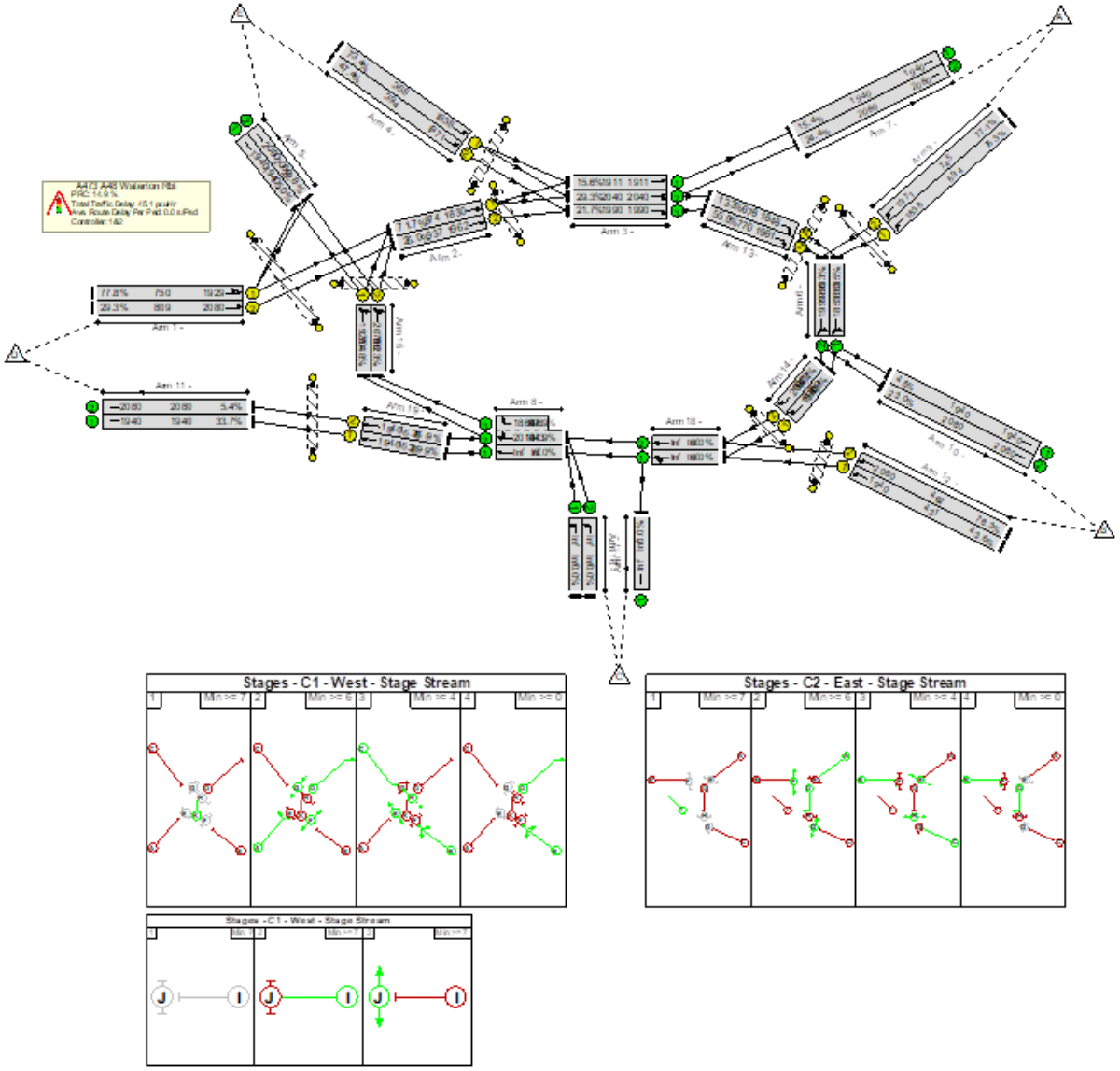
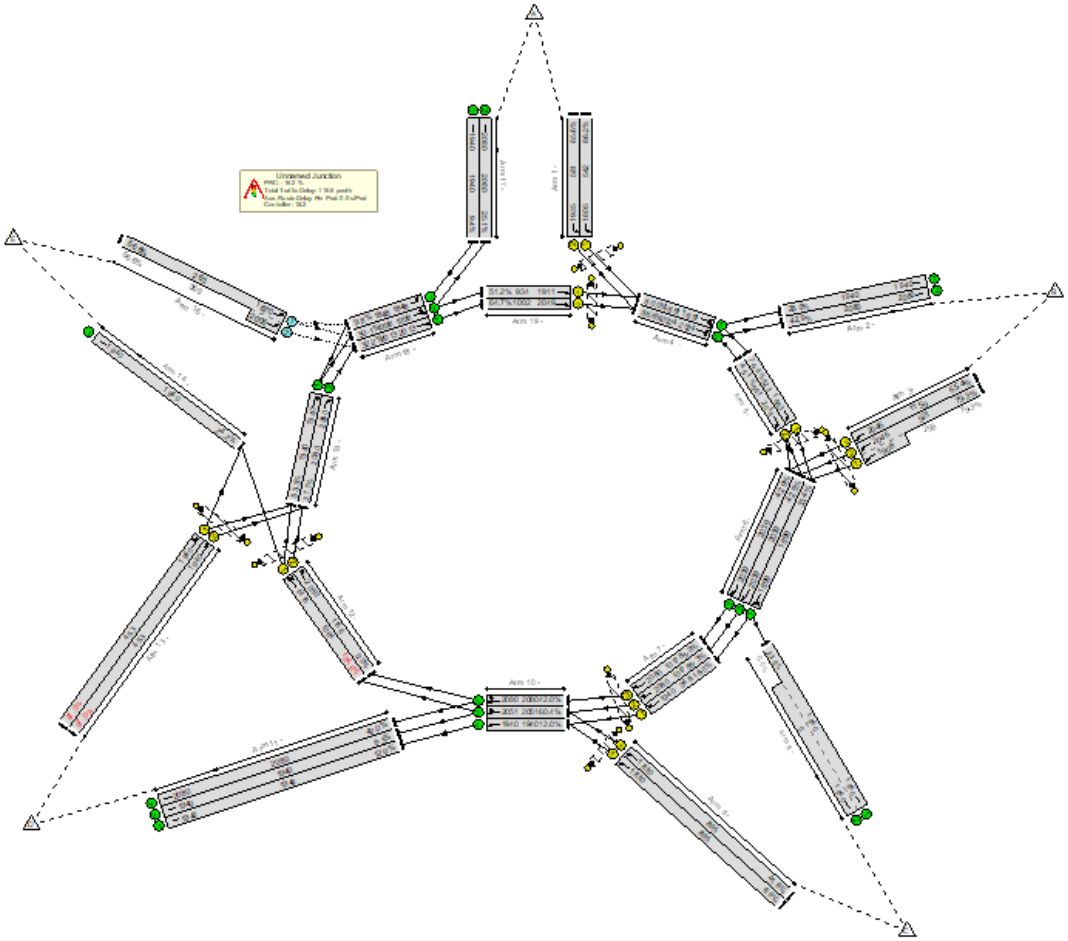


Figure C: Network Layout Diagram, Junction 6



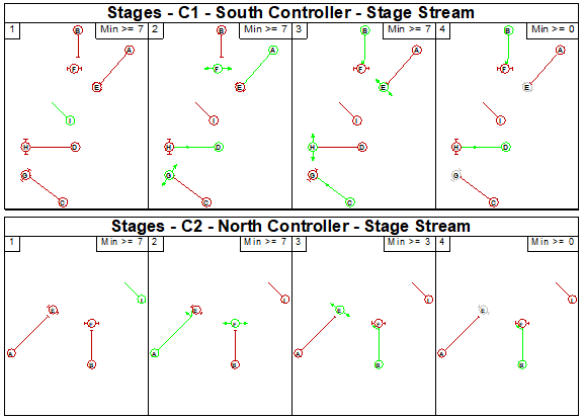


Figure D: Network Layout Diagram, Junction 8

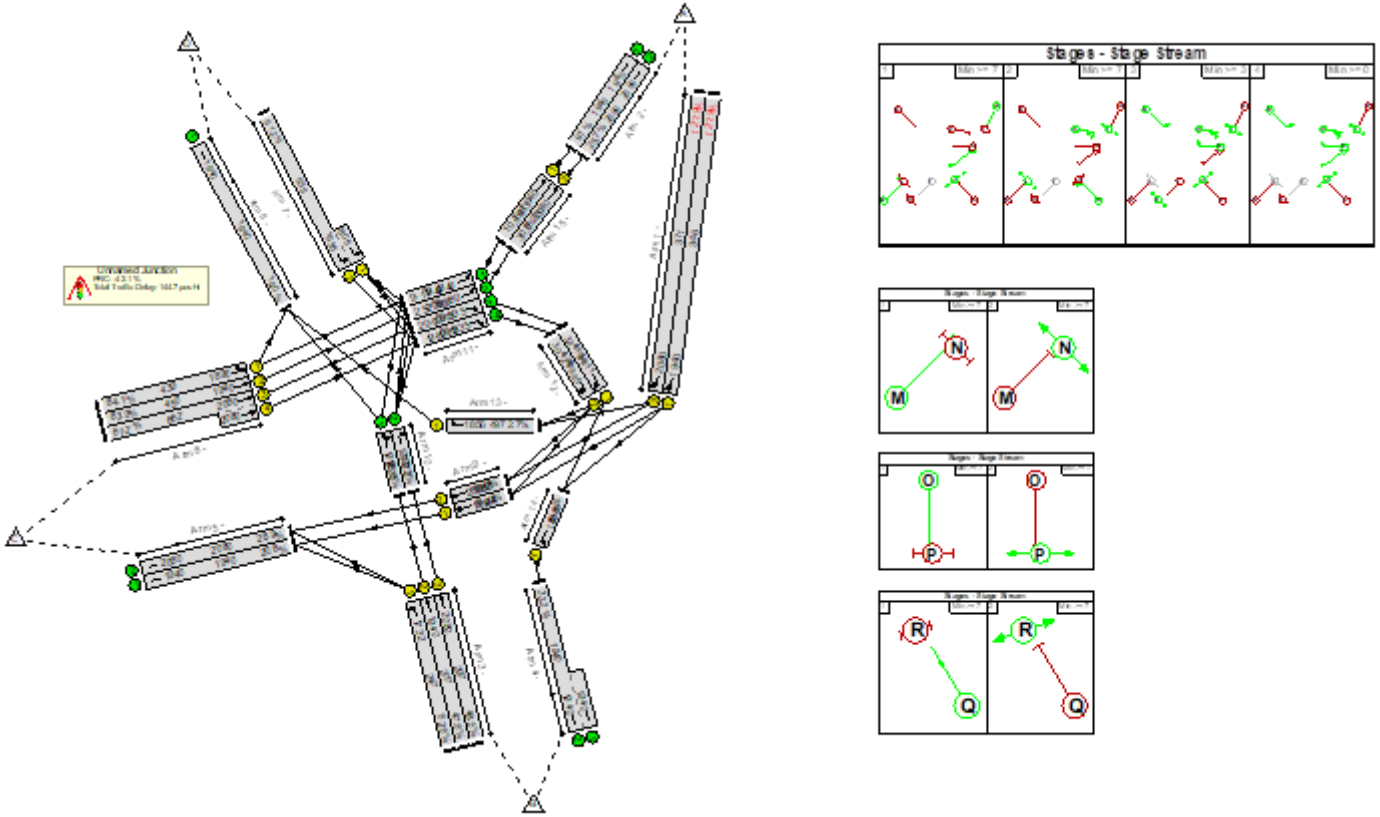


Figure E: Network Layout Diagram, Junction 10

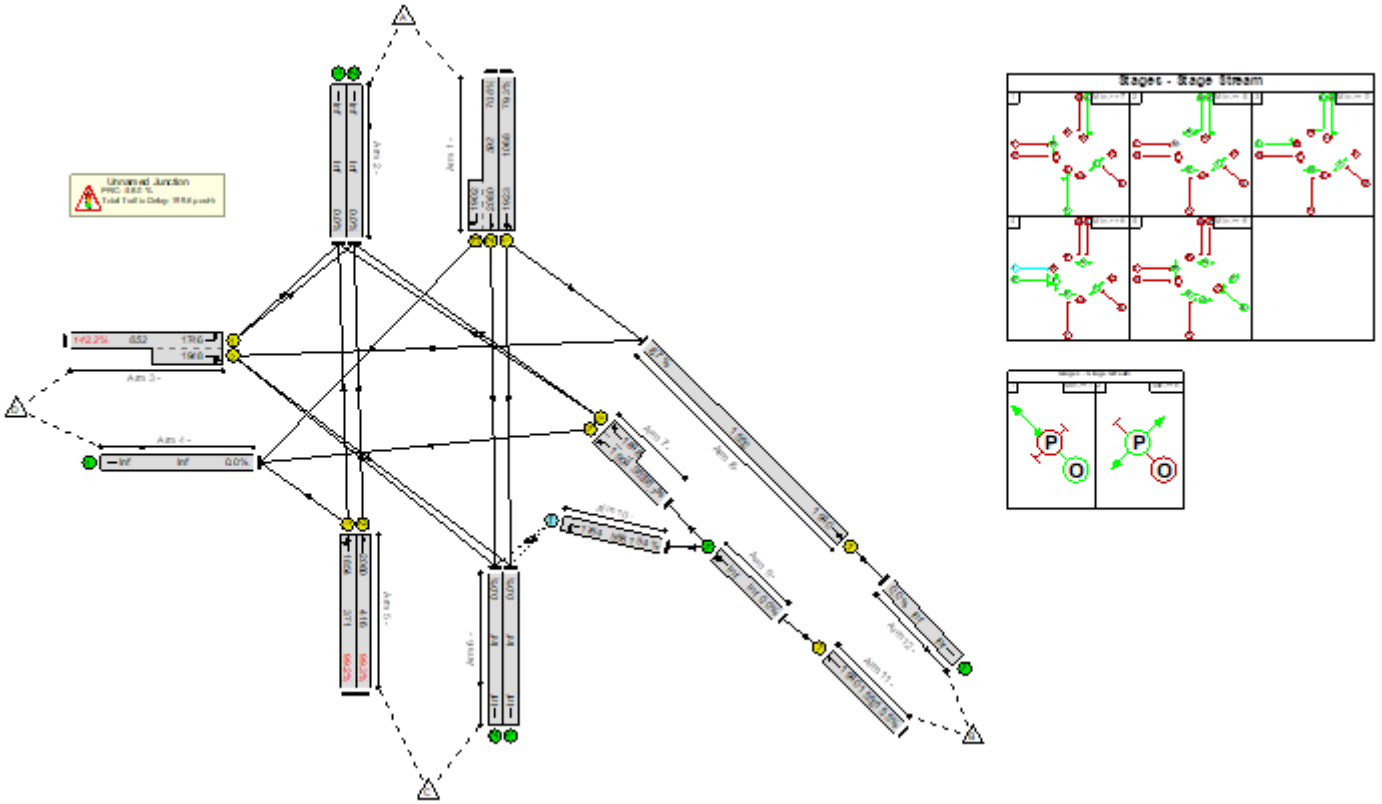
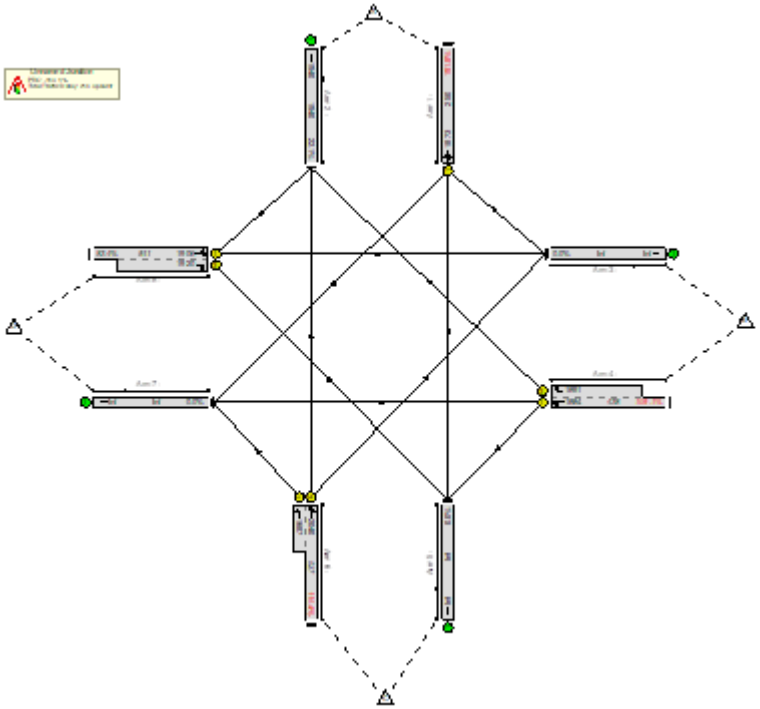


Figure F: Network Layout Diagram, Junction 16



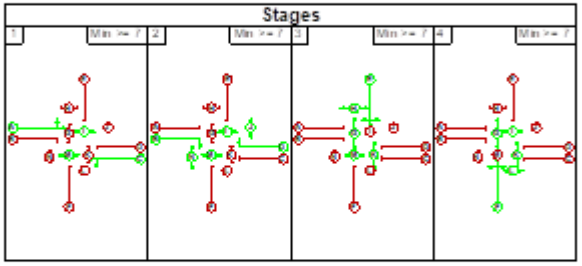
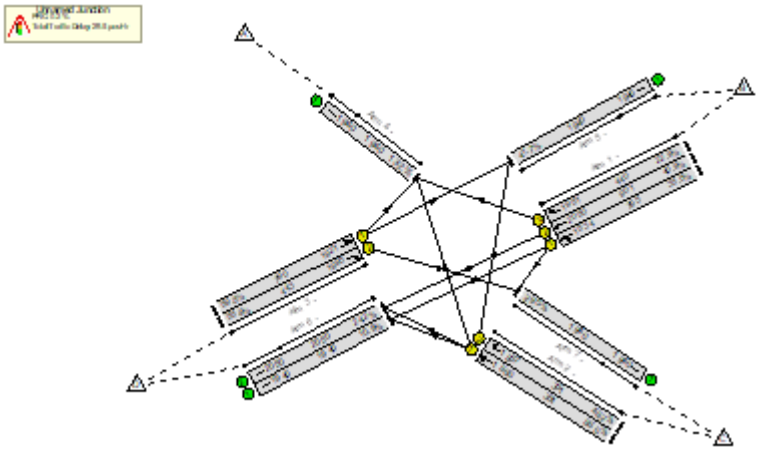


Figure G: Network Layout Diagram, Junction 17



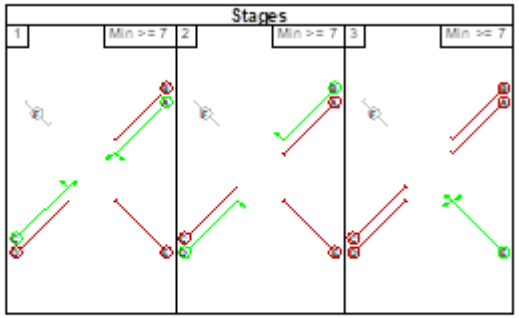
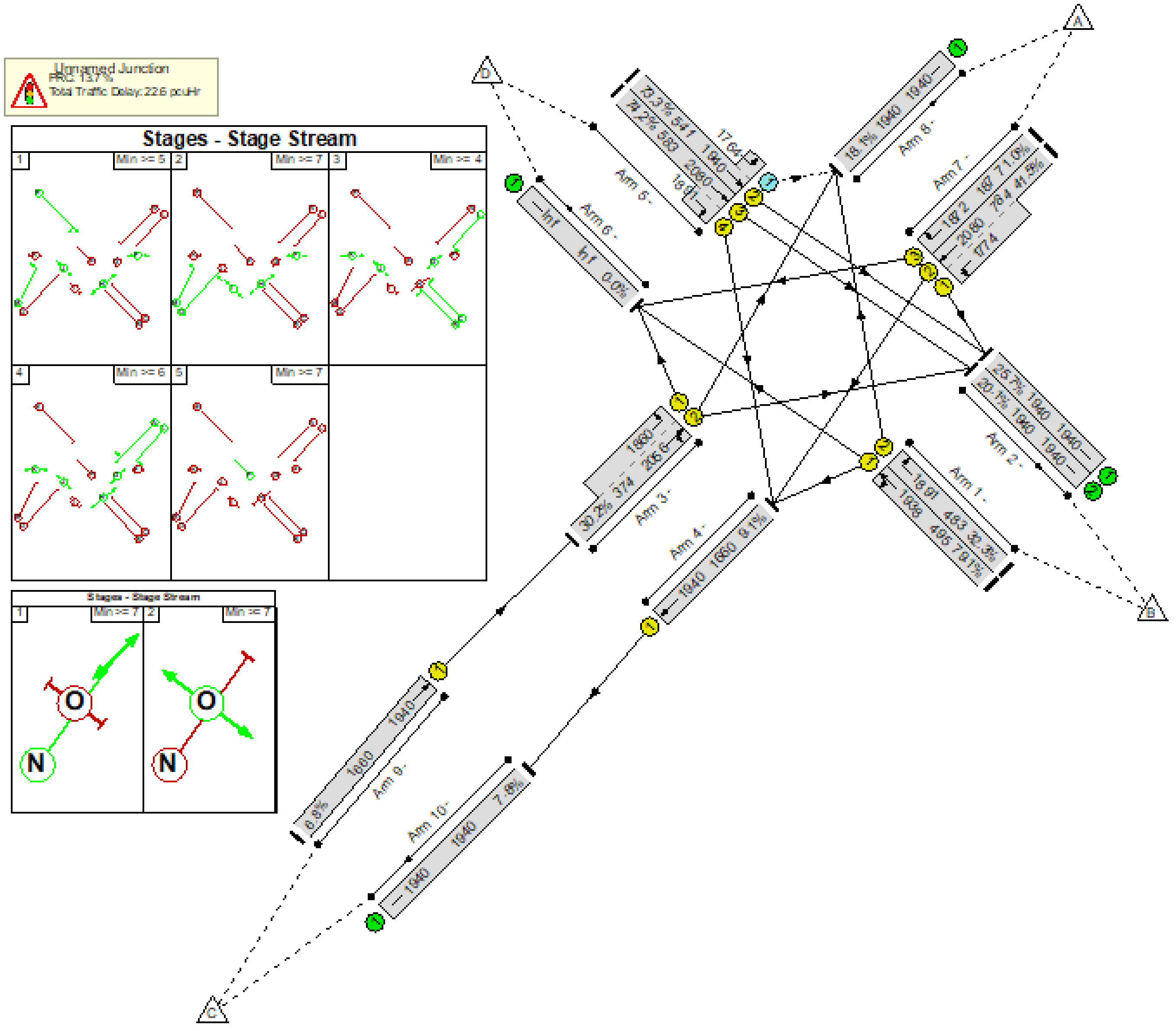


Figure H: Network Layout Diagram, Junction 22



Junction Modelling Output Summary Tables
Committed and candidate Sites

Junction 1, Arcady 9 – Roundabout Module

Table 1: Summary of Junction Performance, Junction 1

	AM						PM					
	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020											
Arm 1	D1	5.0	14.55	0.84	B	4 % [Arm 4]	D2	6.0	16.60	0.86	C	8 % [Arm 1]
Arm 2		4.1	14.36	0.81	B			4.3	15.66	0.82	C	
Arm 3		0.7	3.03	0.42	A			0.6	2.88	0.38	A	
Arm 4		5.0	23.39	0.85	C			1.2	7.40	0.56	A	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 2. Arcady 9 – Roundabout Module

Table 2: Summary of Junction Performance, Junction 2

	AM									PM								
	Set ID	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity	Set ID	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity
	2020																	
Arm 1	D1	9.1	46.4	16.38	0.91	C	115.08	F	-16 % [Arm 2]	D2	176.9	200.0	236.21	1.14	F	136.01	F	-15 % [Arm 1]
Arm 2		104.3	159.7	301.46	1.21	F					3.5	17.5	17.51	0.79	C			
Arm 3		63.4	139.9	112.14	1.06	F					2.6	4.9	6.65	0.73	A			

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 3, Arcady 9 – Roundabout Module

Table 3: Summary of Junction Performance, Junction 3

	AM									PM								
	Set ID	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity	Set ID	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity
	2020																	
Arm 1	D1	10.7	55.0	46.09	0.94	E	111.88	F	-12 % [Arm 3]	D2	1.3	1.5	5.99	0.56	A	5.12	A	23 % [Arm 3]
Arm 2		0.1	0.5	3.92	0.09	A					0.1	0.5	3.68	0.09	A			
Arm 3		165.6	200.0	181.22	1.11	F					3.7	8.5	6.20	0.79	A			

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 4, LINSIG

Table 4a: Junction 4 (AM)

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: A48 Ewenny Roundabout	-	-	-		-	-	-	-	-	-	**191.5%**	**0**	**0**	**0**	**480.8**	-	-
A48 Ewenny Roundabout	-	-	-		-	-	-	-	-	-	**191.5%**	**0**	**0**	**0**	**480.8**	-	-
1/1	Entry A48 Bypass Road (W) Ahead Left	U	D		1	49	-	1258	1930	1072	117.3%	-	-	-	111.0	317.6	132.3
1/2+1/3	Entry A48 Bypass Road (W) Ahead	U	D		1	49	-	1390	2080:2080	1085+102	117.1 : 117.1%	-	-	-	120.8	312.9	145.6
2/1	Ahead	U	E		2	52	-	1058	1940	1164	73.7%	-	-	-	2.0	8.2	4.2
2/2	Ahead	U	E		2	52	-	1288	2080	1248	87.7%	-	-	-	3.9	13.0	6.3
2/3	Right	U	E		2	52	-	120	1857	1114	9.2%	-	-	-	0.1	3.3	0.3
3/1+3/2	Entry B4265 Ewenny Road (N) Left Ahead	U	L		1	7	-	545	1866:2080	166+185	162.8 : 148.7%	-	-	-	111.4	736.1	110.3
4/1	Exit A48 Bypass Road (E)	U	-		-	-	-	1157	1940	1940	47.3%	-	-	-	0.4	1.8	0.4
4/2	Exit A48 Bypass Road (E)	U	-		-	-	-	1331	2080	2080	53.9%	-	-	-	0.6	1.9	0.6
5/1	Exit B4265 Ewenny Road (N)	U	-		-	-	-	639	1940	1940	25.7%	-	-	-	0.2	1.2	0.2
6/1	Ahead	U	I		1	20	-	247	1940	453	39.8%	-	-	-	1.0	20.4	2.6
6/2	Right	U	I		1	20	-	276	1857	433	42.9%	-	-	-	0.4	7.5	3.5
7/1	Entry A48 Bypass Road (E) Left Ahead	U	F		1	57	-	645	1926	1241	52.0%	-	-	-	2.1	11.6	9.1
7/2+7/3	Entry A48 Bypass Road (E) Ahead	U	F		1	57	-	691	1940:1940	1087+213	53.2 : 53.2%	-	-	-	2.1	10.8	8.3
8/2+8/1	Entry B4265 Ewenny Road (S) Left Ahead	U	M		1	7	-	438	2080:1909	80+148	191.5 : 191.5%	-	-	-	120.1	987.3	124.1
9/1	Exit B4265 Ewenny Road (S)	U	-		-	-	-	380	1940	1940	16.1%	-	-	-	0.1	1.1	0.1
10/1	Ahead	U	G		1	73	-	512	1940	1595	32.1%	-	-	-	0.2	1.7	0.2
10/2	Ahead	U	G		1	73	-	847	1940	1595	47.6%	-	-	-	1.1	5.1	4.3
10/3	Right	U	G		1	73	-	120	1732	1424	8.3%	-	-	-	0.1	1.8	0.1
12/1	Ahead	U	J		1	20	-	298	1940	453	46.0%	-	-	-	2.5	42.9	4.2
12/2	Right	U	J		1	20	-	159	1732	404	21.1%	-	-	-	0.7	29.1	0.9
Ped Link: P1	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P2	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P3	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P4	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P5	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P6	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P7	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P8	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf

C1	Stream: 1 PRC for Signalled Lanes (%):	-112.7	Total Delay for Signalled Lanes (pcuHr):	479.46	Cycle Time (s):	90
C1	Stream: 2 PRC for Signalled Lanes (%):	0.0	Total Delay for Signalled Lanes (pcuHr):	0.00	Cycle Time (s):	90
	PRC Over All Lanes (%):	-112.7	Total Delay Over All Lanes(pcuHr):	480.76		

Table 4b: Junction 4 (PM)

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: A48 Ewenny Roundabout	-	-	-		-	-	-	-	-	-	**138.4%**	**0**	**0**	**0**	**188.4**	-	-
A48 Ewenny Roundabout	-	-	-		-	-	-	-	-	-	**138.4%**	**0**	**0**	**0**	**188.4**	-	-
1/1	Entry A48 Bypass Road (W) Ahead Left	U	D		1	42	-	767	1927	921	83.3%	-	-	-	6.8	31.7	19.0
1/2+1/3	Entry A48 Bypass Road (W) Ahead	U	D		1	42	-	852	2080:2080	920+111	82.6 : 82.6%	-	-	-	6.9	29.3	19.6
2/1	Ahead	U	E		2	46	-	575	1940	1035	53.4%	-	-	-	0.9	5.5	1.8
2/2	Ahead	U	E		2	46	-	810	2080	1109	71.8%	-	-	-	1.6	7.1	2.7
2/3	Right	U	E		2	46	-	92	1857	990	9.3%	-	-	-	0.1	3.0	0.2
3/1+3/2	Entry B4265 Ewenny Road (N) Left Ahead	U	L		1	9	-	502	1902:2080	211+189	128.7 : 121.4%	-	-	-	60.6	434.9	61.8
4/1	Exit A48 Bypass Road (E)	U	-		-	-	-	578	1940	1940	28.6%	-	-	-	0.2	1.3	0.2
4/2	Exit A48 Bypass Road (E)	U	-		-	-	-	880	2080	2080	40.9%	-	-	-	0.3	1.5	0.3
5/1	Exit B4265 Ewenny Road (N)	U	-		-	-	-	458	1940	1940	21.7%	-	-	-	0.1	1.2	0.1
6/1	Ahead	U	I		1	23	-	290	1940	517	47.5%	-	-	-	1.1	15.7	2.6
6/2	Right	U	I		1	23	-	231	1857	495	46.6%	-	-	-	0.5	7.1	4.7
7/1	Entry A48 Bypass Road (E) Left Ahead	U	F		1	54	-	1181	1928	1178	100.2%	-	-	-	23.8	72.4	47.5
7/2+7/3	Entry A48 Bypass Road (E) Ahead	U	F		1	54	-	1188	1940:1940	1149+50	99.1 : 99.1%	-	-	-	20.3	61.5	43.5
8/2+8/1	Entry B4265 Ewenny Road (S) Left Ahead	U	M		1	8	-	355	2080:1905	95+161	138.4 : 138.4%	-	-	-	58.4	592.4	61.5
9/1	Exit B4265 Ewenny Road (S)	U	-		-	-	-	491	1940	1940	23.0%	-	-	-	0.1	1.2	0.1
10/1	Ahead	U	G		1	72	-	980	1940	1574	62.1%	-	-	-	0.8	3.0	0.8
10/2	Ahead	U	G		1	72	-	1368	1940	1574	86.9%	-	-	-	4.0	10.4	15.6
10/3	Right	U	G		1	72	-	51	1732	1405	3.6%	-	-	-	0.0	1.5	0.0
12/1	Ahead	U	J		1	23	-	184	1940	517	28.4%	-	-	-	1.3	30.6	2.3
12/2	Right	U	J		1	23	-	132	1732	462	20.7%	-	-	-	0.7	25.8	0.9
Ped Link: P1	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P2	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P3	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P4	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P5	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P6	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P7	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf
Ped Link: P8	Unnamed Ped Link	-			0	0	-	0	-	0	0.0%	-	-	-	Inf	Inf	Inf

C1	Stream: 1 PRC for Signalled Lanes (%):	-53.7	Total Delay for Signalled Lanes (pcuHr):	187.57	Cycle Time (s): 90
C1	Stream: 2 PRC for Signalled Lanes (%):	0.0	Total Delay for Signalled Lanes (pcuHr):	0.00	Cycle Time (s): 90
	PRC Over All Lanes (%):	-53.7	Total Delay Over All Lanes(pcuHr):	188.40	

Junction 5, LINSIG

Table 5a: Junction 5 (AM)

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: A473 A48 Waterton Rbt	-	-	-		-	-	-	-	-	-	**239.1%**	**0**	**0**	**0**	**1528.5**	-	-
A473 A48 Waterton Rbt	-	-	-		-	-	-	-	-	-	**239.1%**	**0**	**0**	**0**	**1528.5**	-	-
1/1	Ahead Left	U	C1:A		1	35	-	1090	1929	772	141.3%	-	-	-	184.6	609.7	197.1
1/2	Ahead	U	C1:A		1	35	-	1100	2080	832	132.2%	-	-	-	157.3	514.9	170.2
2/1	Ahead	U	C1:D		2	47	-	1604	1830	996	115.1%	-	-	-	90.5	284.1	104.6
2/2	Ahead	U	C1:D		2	47	-	1100	1962	1068	77.9%	-	-	-	3.2	14.0	17.3
3/1	Ahead	U	-		-	-	-	1098	1911	1911	33.3%	-	-	-	0.2	1.4	0.2
3/2	Ahead Ahead2	U	-		-	-	-	1092	2031	2031	29.8%	-	-	-	0.2	1.3	0.2
3/3	Ahead	U	-		-	-	-	1479	1990	1990	55.0%	-	-	-	0.6	2.0	0.6
4/1	Ahead	U	C1:C		1	11	-	586	1838	245	239.1%	-	-	-	192.1	1180.3	196.9
4/2	Ahead	U	C1:C		1	11	-	379	1971	263	144.2%	-	-	-	68.4	649.9	72.1
5/1		U	-		-	-	-	111	1940	1940	4.7%	-	-	-	0.0	1.0	0.0
5/2		U	-		-	-	-	878	2080	2080	29.3%	-	-	-	0.2	1.2	0.2
6/1	Left Ahead	U	-		-	-	-	1485	1862	1862	42.5%	-	-	-	0.4	1.7	0.4
6/2	Left Ahead	U	-		-	-	-	2714	2003	2003	75.7%	-	-	-	1.5	3.7	1.5
7/1		U	-		-	-	-	1098	1940	1940	32.8%	-	-	-	0.2	1.4	0.2
7/2		U	-		-	-	-	763	2080	2080	21.5%	-	-	-	0.1	1.1	0.1
8/2+8/3	Right Ahead	U	-		-	-	-	1804	2019:1860	1104+843	64.4 : 64.3%	-	-	-	1.1	3.1	20.0
9/1	Left	U	C2:A		1	30	-	1156	1838	633	182.6%	-	-	-	299.3	932.2	315.0
9/2	Left	U	C2:A		1	30	-	1235	1971	679	181.9%	-	-	-	318.3	927.9	335.1
10/1		U	-		-	-	-	603	1940	1940	16.2%	-	-	-	0.1	1.1	0.1
10/2		U	-		-	-	-	1580	2080	2080	42.5%	-	-	-	0.4	1.5	0.4
11/1		U	-		-	-	-	1215	1940	1940	44.3%	-	-	-	0.4	1.7	0.4
11/2		U	-		-	-	-	301	2080	2080	8.5%	-	-	-	0.0	0.9	0.0
12/1	Ahead	U	C2:C		1	22	-	454	1940	496	91.6%	-	-	-	8.6	68.0	15.4
12/2	Ahead	U	C2:C		1	22	-	580	2080	532	109.1%	-	-	-	36.7	227.5	44.9
13/1	Right	U	C1:B		1	31	-	329	1848	657	24.0%	-	-	-	0.5	11.5	1.3
13/2	Right	U	C2:B		1	37	-	1479	1981	836	130.9%	-	-	-	149.6	491.8	167.5
14/1	Right	U	C2:D		2	37	-	882	1940	841	56.8%	-	-	-	1.5	11.7	3.4
14/2	Right	U	C2:D		2	37	-	1134	2080	901	70.0%	-	-	-	2.5	14.2	4.6
15/1	Right Ahead	U	C1:B		1	31	-	722	1877	667	80.1%	-	-	-	4.9	32.8	14.3
15/2	Right Ahead	U	C1:B		1	31	-	781	2080	740	73.3%	-	-	-	4.2	28.0	13.7
19/1	Ahead	U	C1:I		1	75	-	1215	1940	1638	52.4%	-	-	-	0.6	2.4	0.8
19/2	Ahead	U	C1:I		1	75	-	301	1940	1638	10.7%	-	-	-	0.1	1.5	0.2
Ped Link: P1	Unnamed Ped Link	-	C1:E		1	15	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P2	Unnamed Ped Link	-	C1:J		1	7	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P3	Unnamed Ped Link	-	C1:F		1	37	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P4	Unnamed Ped Link	-	C1:H		1	15	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P5	Unnamed Ped Link	-	C1:G		1	37	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P6	Unnamed Ped Link	-	C2:F		1	32	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P7	Unnamed Ped Link	-	C2:E		1	25	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P8	Unnamed Ped Link	-	C2:H		1	25	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P9	Unnamed Ped Link	-	C2:G		1	32	-	0	-	0	0.0%	-	-	-	-	-	-

C1 - West	Stream: 1 PRC for Signalled Lanes (%):	-165.7	Total Delay for Signalled Lanes (pcuHr):	705.78	Cycle Time (s): 90
C1 - West	Stream: 2 PRC for Signalled Lanes (%):	71.7	Total Delay for Signalled Lanes (pcuHr):	0.64	Cycle Time (s): 90
C2 - East	Stream: 1 PRC for Signalled Lanes (%):	-102.9	Total Delay for Signalled Lanes (pcuHr):	816.48	Cycle Time (s): 90
	PRC Over All Lanes (%):	-165.7	Total Delay Over All Lanes(pcuHr):	1528.48	

Table 5b: Junction 5 (PM)

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: A473 A48 Waterton Rbt	-	-	-		-	-	-	-	-	-	**199.4%**	**0**	**0**	**0**	**1365.2**	-	-
A473 A48 Waterton Rbt	-	-	-		-	-	-	-	-	-	**199.4%**	**0**	**0**	**0**	**1365.2**	-	-
1/1	Ahead Left	U	C1:A		1	36	-	1021	1928	793	128.8%	-	-	-	133.3	470.0	147.6
1/2	Ahead	U	C1:A		1	36	-	351	2080	855	41.0%	-	-	-	2.2	22.3	6.5
2/1	Ahead	U	C1:D		2	43	-	1663	1830	915	129.0%	-	-	-	151.5	462.0	167.2
2/2	Ahead	U	C1:D		2	43	-	380	1962	981	38.7%	-	-	-	0.6	5.6	3.7
3/1	Ahead	U	-		-	-	-	1058	1911	1911	31.8%	-	-	-	0.2	1.4	0.2
3/2	Ahead Ahead2	U	-		-	-	-	1104	2044	2044	31.1%	-	-	-	0.2	1.3	0.2
3/3	Ahead	U	-		-	-	-	733	1990	1990	36.7%	-	-	-	0.3	1.4	0.3
4/1	Ahead	U	C1:C		1	15	-	499	1838	327	152.7%	-	-	-	100.3	723.8	106.6
4/2	Ahead	U	C1:C		1	15	-	353	1971	350	100.7%	-	-	-	13.8	140.5	19.0
5/1		U	-		-	-	-	96	1940	1940	3.0%	-	-	-	0.0	1.0	0.0
5/2		U	-		-	-	-	942	2080	2080	29.2%	-	-	-	0.2	1.2	0.2
6/1	Left Ahead	U	-		-	-	-	1120	1851	1851	30.9%	-	-	-	0.2	1.4	0.2
6/2	Left Ahead	U	-		-	-	-	1823	1996	1996	64.0%	-	-	-	0.9	2.5	0.9
7/1		U	-		-	-	-	1058	1940	1940	31.3%	-	-	-	0.2	1.3	0.2
7/2		U	-		-	-	-	1002	2080	2080	27.5%	-	-	-	0.2	1.2	0.2
8/2+8/3	Right Ahead	U	-		-	-	-	2197	2026:1860	1149+805	70.0 : 72.6%	-	-	-	1.6	4.1	24.4
9/1	Left	U	C2:A		1	24	-	1018	1838	511	199.4%	-	-	-	285.6	1010.0	294.5
9/2	Left	U	C2:A		1	24	-	1090	1971	547	199.1%	-	-	-	305.3	1008.3	314.8
10/1		U	-		-	-	-	109	1940	1940	2.8%	-	-	-	0.0	1.0	0.0
10/2		U	-		-	-	-	739	2080	2080	33.3%	-	-	-	0.2	1.3	0.2
11/1		U	-		-	-	-	1828	1940	1940	57.2%	-	-	-	0.7	2.2	0.7
11/2		U	-		-	-	-	488	2080	2080	14.8%	-	-	-	0.1	1.0	0.1
12/1	Ahead	U	C2:C		1	28	-	916	1940	625	146.5%	-	-	-	167.9	659.9	180.6
12/2	Ahead	U	C2:C		1	28	-	981	2080	670	146.4%	-	-	-	179.3	658.0	192.9
13/1	Right	U	C1:B		1	30	-	102	1848	637	9.8%	-	-	-	0.2	10.8	0.4
13/2	Right	U	C2:B		1	43	-	733	1981	968	75.4%	-	-	-	3.9	19.1	11.1
14/1	Right	U	C2:D		2	31	-	1011	1940	711	72.8%	-	-	-	2.8	19.4	5.3
14/2	Right	U	C2:D		2	31	-	1084	2080	763	76.9%	-	-	-	3.3	20.1	6.4
15/1	Right Ahead	U	C1:B		1	30	-	804	1872	645	77.1%	-	-	-	4.2	30.6	12.7
15/2	Right Ahead	U	C1:B		1	30	-	905	2077	715	81.7%	-	-	-	4.7	29.1	14.9
19/1	Ahead	U	C1:I		1	75	-	1828	1940	1638	67.7%	-	-	-	1.1	3.5	12.4
19/2	Ahead	U	C1:I		1	75	-	488	1940	1638	18.8%	-	-	-	0.2	1.9	0.7
Ped Link: P1	Unnamed Ped Link	-	C1:E		1	19	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P2	Unnamed Ped Link	-	C1:J		1	7	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P3	Unnamed Ped Link	-	C1:F		1	38	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P4	Unnamed Ped Link	-	C1:H		1	19	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P5	Unnamed Ped Link	-	C1:G		1	38	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P6	Unnamed Ped Link	-	C2:F		1	26	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P7	Unnamed Ped Link	-	C2:E		1	31	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P8	Unnamed Ped Link	-	C2:H		1	31	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P9	Unnamed Ped Link	-	C2:G		1	26	-	0	-	0	0.0%	-	-	-	-	-	-

C1 - West	Stream: 1 PRC for Signalled Lanes (%):	-89.7	Total Delay for Signalled Lanes (pcuHr):	410.82	Cycle Time (s): 90
C1 - West	Stream: 2 PRC for Signalled Lanes (%):	32.9	Total Delay for Signalled Lanes (pcuHr):	1.25	Cycle Time (s): 90
C2 - East	Stream: 1 PRC for Signalled Lanes (%):	-121.5	Total Delay for Signalled Lanes (pcuHr):	948.08	Cycle Time (s): 90
	PRC Over All Lanes (%):	-121.5	Total Delay Over All Lanes(pcuHr):	1365.24	

Junction 6, LINSIG

Table 6a: Junction 6 (AM)

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	-	-	-		-	-	-	-	-	-	**130.2%**	**876**	**0**	**0**	**818.2**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**130.2%**	**876**	**0**	**0**	**818.2**	-	-
1/1	Left	U	C2:C		1	31	-	829	1805	642	129.2%	-	-	-	112.6	488.8	125.4
1/2	Left	U	C2:C		1	31	-	896	1935	688	130.2%	-	-	-	124.6	500.5	138.4
2/1		U	-		-	-	-	634	1940	1940	29.1%	-	-	-	0.2	1.3	0.2
2/2		U	-		-	-	-	1136	2080	2080	49.4%	-	-	-	0.5	1.7	0.5
3/2+3/1	Ahead	U	C1:A		1	39	-	1344	2046:1908	617+439	127.2 : 127.2%	-	-	-	166.7	446.6	184.4
3/3	Ahead	U	C1:A		1	39	-	1020	2046	909	112.2%	-	-	-	71.4	251.8	87.9
4/1	Ahead Ahead2	U	-		-	-	-	1567	1894	1894	69.8%	-	-	-	1.2	3.2	12.3
4/2	Ahead Ahead2	U	-		-	-	-	1756	2026	2026	75.5%	-	-	-	1.5	3.6	5.5
5/1	Right	U	C1:B		1	35	-	933	1883	753	100.6%	-	-	-	18.6	88.6	34.0
5/2	Right	U	C1:B		1	35	-	620	2019	808	62.2%	-	-	-	3.0	21.7	5.9
6/1	Ahead Left	U	-		-	-	-	1492	1899	1899	62.8%	-	-	-	0.8	2.5	0.8
6/2	Ahead	U	-		-	-	-	1305	2039	2039	51.0%	-	-	-	0.5	1.8	0.5
6/3	Ahead	U	-		-	-	-	1120	2039	2039	48.5%	-	-	-	0.5	1.7	17.5
7/1	Ahead	U	C2:D		1	38	-	446	1940	841	42.6%	-	-	-	1.6	15.8	4.4
7/2	Ahead	U	C2:D		1	38	-	1305	2080	901	115.4%	-	-	-	84.9	293.9	102.3
7/3	Ahead	U	C2:D		1	38	-	1120	2080	901	109.7%	-	-	-	55.5	202.3	75.6
8/1+8/2		U	-		-	-	-	1046	1940:1940	1940+0	43.0 : 0.0%	-	-	-	0.4	1.6	0.4
9/1	Ahead	U	C2:D		1	38	-	105	1830	793	13.2%	-	-	-	0.5	18.0	1.7
9/2	Ahead	U	C2:D		1	38	-	475	1830	793	59.9%	-	-	-	3.3	25.2	9.7
10/1	Ahead	U	-		-	-	-	551	1940	1940	23.9%	-	-	-	0.3	2.0	6.9
10/2	Ahead Right	U	-		-	-	-	1780	2056	2056	66.9%	-	-	-	5.5	14.4	34.9

10/3	Ahead Right	U	-		-	-	-	1120	2080	2080	43.3%	-	-	-	0.4	1.5	1.5
11/1		U	-		-	-	-	551	1940	1940	23.9%	-	-	-	0.2	1.2	0.2
11/2		U	-		-	-	-	491	1940	1940	20.7%	-	-	-	0.1	1.2	0.1
11/3		U	-		-	-	-	1120	2080	2080	43.3%	-	-	-	0.4	1.5	0.4
12/1	Ahead Right	U	C2:B		1	38	-	1289	1914	829	117.4%	-	-	-	88.1	325.5	107.0
12/2	Right	U	C2:B		1	38	-	0	2080	901	0.0%	-	-	-	0.0	0.0	0.0
13/1	Left Ahead	U	C2:A		1	31	-	715	1940	690	103.7%	-	-	-	28.0	140.8	39.6
13/2	Ahead	U	C2:A		1	31	-	709	1940	690	102.8%	-	-	-	25.5	129.6	37.2
14/1		U	-		-	-	-	567	1940	1940	18.5%	-	-	-	0.1	1.1	0.1
15/1+15/2	Ahead	O	-		-	-	-	438	1870:2005	324+170	88.6 : 88.6%	876	0	0	4.9	40.4	10.3
16/1	Right	U	-		-	-	-	1437	1940	1940	59.8%	-	-	-	0.7	2.3	0.7
16/2	Right	U	-		-	-	-	709	2080	2080	33.2%	-	-	-	0.2	1.3	0.2
17/1		U	-		-	-	-	589	1940	1940	23.7%	-	-	-	0.2	1.2	0.2
17/2		U	-		-	-	-	397	2080	2080	14.7%	-	-	-	0.1	1.0	0.1
18/1	Left	U	-		-	-	-	589	1848	1848	24.9%	-	-	-	0.2	1.3	0.2
18/2	Left Ahead	U	-		-	-	-	1135	2002	2002	49.3%	-	-	-	0.5	1.8	0.5
18/3	Ahead	U	-		-	-	-	860	2013	2013	41.8%	-	-	-	0.4	1.5	0.4
19/1	Ahead	U	C2:D		1	38	-	738	1911	828	82.2%	-	-	-	5.6	29.4	15.8
19/2	Ahead	U	C2:D		1	38	-	860	2049	888	94.7%	-	-	-	8.6	37.0	13.2
Ped Link: P1	Unnamed Ped Link	-	C2:F		1	31	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P2	Unnamed Ped Link	-	C2:E		1	17	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P3	Unnamed Ped Link	-	C1:H		1	39	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P4	Unnamed Ped Link	-	C1:G		1	41	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P5	Unnamed Ped Link	-	C1:F		1	41	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P6	Unnamed Ped Link	-	C1:E		1	39	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P7	Unnamed Ped Link	-	C2:H		1	31	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P8	Unnamed Ped Link	-	C2:G		1	22	-	0	-	0	0.0%	-	-	-	-	-	-

C1 - South Controller	Stream: 1 PRC for Signalled Lanes (%):	-41.4	Total Delay for Signalled Lanes (pcuHr):	259.76	Cycle Time (s): 90
C2 - North Controller	Stream: 1 PRC for Signalled Lanes (%):	-30.6	Total Delay for Signalled Lanes (pcuHr):	141.55	Cycle Time (s): 90
C2 - North Controller	Stream: 2 PRC for Signalled Lanes (%):	-44.7	Total Delay for Signalled Lanes (pcuHr):	397.19	Cycle Time (s): 90
	PRC Over All Lanes (%):	-44.7	Total Delay Over All Lanes(pcuHr):	818.18	

Table 6b: Junction 6 (PM)

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	-	-	-		-	-	-	-	-	-	**270.6%**	**626**	**0**	**0**	**861.8**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**270.6%**	**626**	**0**	**0**	**861.8**	-	-
1/1	Left	U	C2:C		1	25	-	443	1805	521	85.0%	-	-	-	6.4	51.7	13.0
1/2	Left	U	C2:C		1	25	-	476	1935	559	85.2%	-	-	-	6.7	50.5	13.8
2/1		U	-		-	-	-	1042	1940	1940	35.5%	-	-	-	0.3	1.4	0.3
2/2		U	-		-	-	-	998	2080	2080	47.0%	-	-	-	0.4	1.6	0.4
3/2+3/1	Ahead	U	C1:A		1	49	-	1173	2046:1908	635+688	88.7 : 88.7%	-	-	-	8.3	25.5	21.9
3/3	Ahead	U	C1:A		1	49	-	592	2046	1137	52.1%	-	-	-	2.6	15.8	9.8
4/1	Ahead Ahead2	U	-		-	-	-	1526	1889	1889	60.6%	-	-	-	0.8	2.5	10.8
4/2	Ahead Ahead2	U	-		-	-	-	1439	2025	2025	69.8%	-	-	-	1.2	2.9	1.2
5/1	Right	U	C1:B		1	25	-	484	1883	544	83.9%	-	-	-	5.3	42.1	13.8
5/2	Right	U	C1:B		1	25	-	441	2019	583	74.8%	-	-	-	3.9	32.4	12.3
6/1	Ahead Left	U	-		-	-	-	1094	1900	1900	56.1%	-	-	-	0.6	2.2	1.7
6/2	Ahead	U	-		-	-	-	714	2039	2039	34.9%	-	-	-	0.3	1.4	0.3
6/3	Ahead	U	-		-	-	-	882	2039	2039	43.1%	-	-	-	0.4	1.6	3.8
7/1	Ahead	U	C2:D		1	44	-	595	1940	970	60.0%	-	-	-	2.7	16.5	7.9
7/2	Ahead	U	C2:D		1	44	-	714	2080	1040	68.5%	-	-	-	3.6	18.2	9.5
7/3	Ahead	U	C2:D		1	44	-	882	2080	1040	84.5%	-	-	-	5.6	22.9	14.8
8/1+8/2		U	-		-	-	-	499	1940:1940	1940+0	24.9 : 0.0%	-	-	-	0.2	1.2	0.2
9/1	Ahead	U	C2:D		1	44	-	132	1830	915	14.4%	-	-	-	0.5	14.4	1.8
9/2	Ahead	U	C2:D		1	44	-	1011	1830	915	110.5%	-	-	-	63.4	225.9	80.5
10/1	Ahead	U	-		-	-	-	727	1940	1940	36.8%	-	-	-	0.5	2.4	9.1
10/2	Ahead Right	U	-		-	-	-	1725	2050	2050	79.4%	-	-	-	8.1	17.9	42.1

10/3	Ahead Right	U	-		-	-	-	882	2080	2080	42.2%	-	-	-	0.4	1.5	0.4
11/1		U	-		-	-	-	727	1940	1940	36.8%	-	-	-	0.3	1.5	0.3
11/2		U	-		-	-	-	140	1940	1940	7.1%	-	-	-	0.0	1.0	0.0
11/3		U	-		-	-	-	882	2080	2080	42.2%	-	-	-	0.4	1.5	0.4
12/1	Ahead Right	U	C2:B		1	25	-	1585	1905	550	270.6%	-	-	-	530.8	1283.3	548.2
12/2	Right	U	C2:B		1	25	-	0	2080	601	0.0%	-	-	-	0.0	0.0	0.0
13/1	Left Ahead	U	C2:A		1	44	-	933	1940	970	96.2%	-	-	-	14.2	54.9	30.9
13/2	Ahead	U	C2:A		1	44	-	911	1940	970	93.9%	-	-	-	11.7	46.3	27.6
14/1		U	-		-	-	-	298	1940	1940	8.6%	-	-	-	0.0	1.0	0.0
15/1+15/2	Ahead	O	-		-	-	-	611	1870:2005	286+27	195.2 : 195.2%	626	0	0	169.5	998.7	194.9
16/1	Right	U	-		-	-	-	2220	1940	1940	67.9%	-	-	-	1.1	2.9	1.1
16/2	Right	U	-		-	-	-	911	2080	2080	43.8%	-	-	-	0.4	1.5	0.4
17/1		U	-		-	-	-	1170	1940	1940	31.7%	-	-	-	0.2	1.4	0.2
17/2		U	-		-	-	-	526	2080	2080	13.7%	-	-	-	0.1	1.0	0.1
18/1	Left	U	-		-	-	-	1170	1848	1848	33.3%	-	-	-	0.2	1.5	0.2
18/2	Left Ahead	U	-		-	-	-	1609	2002	2002	49.3%	-	-	-	0.5	1.8	0.5
18/3	Ahead	U	-		-	-	-	963	2013	2013	46.6%	-	-	-	0.4	1.7	0.4
19/1	Ahead	U	C2:D		1	44	-	1083	1911	955	73.5%	-	-	-	4.1	20.8	13.8
19/2	Ahead	U	C2:D		1	44	-	963	2049	1025	91.5%	-	-	-	5.8	22.4	7.3
Ped Link: P1	Unnamed Ped Link	-	C2:F		1	44	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P2	Unnamed Ped Link	-	C2:E		1	7	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P3	Unnamed Ped Link	-	C1:H		1	29	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P4	Unnamed Ped Link	-	C1:G		1	51	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P5	Unnamed Ped Link	-	C1:F		1	51	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P6	Unnamed Ped Link	-	C1:E		1	29	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P7	Unnamed Ped Link	-	C2:H		1	25	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P8	Unnamed Ped Link	-	C2:G		1	26	-	0	-	0	0.0%	-	-	-	-	-	-

C1 - South Controller	Stream: 1 PRC for Signalled Lanes (%):	1.5	Total Delay for Signalled Lanes (pcuHr):	20.17	Cycle Time (s): 90
C2 - North Controller	Stream: 1 PRC for Signalled Lanes (%):	-200.6	Total Delay for Signalled Lanes (pcuHr):	556.72	Cycle Time (s): 90
C2 - North Controller	Stream: 2 PRC for Signalled Lanes (%):	-22.8	Total Delay for Signalled Lanes (pcuHr):	98.73	Cycle Time (s): 90
	PRC Over All Lanes (%):	-200.6	Total Delay Over All Lanes(pcuHr):	861.84	

Junction 7, Arcady 9 – Roundabout Module

Table 7: Summary of Junction Performance, Junction 7

	AM									PM								
	Set ID	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity	Set ID	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity
	2020																	
Arm B	D1	39.7	89.5	146.11	1.07	F	30.28	D	-7 % [Arm B]	D2	1.7	2.2	7.62	0.63	A	22.52	C	-5 % [Arm C]
Arm C		6.7	35.8	24.06	0.88	C					29.6	97.8	71.55	1.01	F			
Arm D		0.6	2.9	2.34	0.38	A					1.8	2.6	4.74	0.64	A			
Arm E		0.4	1.7	6.87	0.31	A					2.0	10.5	31.46	0.68	D			
Arm A		2.8	6.5	4.10	0.74	A					1.4	2.3	2.78	0.59	A			

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 8, LINSIG

Table 8a: Junction 8 (AM)

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	-	-	-		-	-	-	-	-	-	**88.3%**	**0**	**0**	**0**	**50.2**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**88.3%**	**0**	**0**	**0**	**50.2**	-	-
1/1	Right Ahead	U	A		1	31	-	547	1940	690	79.3%	-	-	-	5.8	38.3	14.0
1/2	Right Right2	U	A		1	31	-	570	2080	740	77.1%	-	-	-	5.7	36.2	14.2
2/1		U	-		-	-	-	251	1940	1940	12.9%	-	-	-	0.1	1.1	0.1
2/2		U	-		-	-	-	682	2080	2080	32.8%	-	-	-	0.2	1.3	0.2
3/1	Left	U	C		1	11	-	178	1732	231	77.1%	-	-	-	3.4	69.8	5.8
3/2	Ahead	U	C		1	11	-	167	1940	259	64.6%	-	-	-	2.6	56.3	4.8
3/3	Ahead	U	C		1	11	-	175	2080	277	63.1%	-	-	-	2.6	54.2	5.0
4/2+4/1		U	-		-	-	-	790	1940:1940	1940	40.7%	-	-	-	0.3	1.6	0.3
5/1		U	-		-	-	-	449	1940	1940	23.1%	-	-	-	0.2	1.2	0.2
5/2		U	-		-	-	-	895	2080	2080	43.0%	-	-	-	0.4	1.5	0.4
6/1	Left Ahead	U	B		1	34	-	484	1897	738	65.6%	-	-	-	4.0	29.6	10.8
6/2	Ahead	U	B		1	34	-	479	1940	754	63.5%	-	-	-	3.8	28.8	10.6
6/3+6/4	Ahead	U	B		1	34	-	425	2080:2080	912	46.6%	-	-	-	2.7	22.6	5.3
7/2+7/1	Left	U	D		1	19	-	492	1935:1805	557	88.3%	-	-	-	7.8	56.9	11.3
8/1		U	-		-	-	-	450	1940	1940	23.2%	-	-	-	0.2	1.2	0.2
9/1	Ahead	U	E		1	47	-	443	1940	1035	42.8%	-	-	-	1.8	15.0	6.0
9/2	Ahead	U	E		1	47	-	723	2080	1109	65.2%	-	-	-	1.7	8.7	5.2
10/1	Ahead Right	U	-		-	-	-	167	1940	1940	8.6%	-	-	-	0.0	1.0	0.0
10/2	Right	U	-		-	-	-	175	1972	1972	8.9%	-	-	-	0.0	1.0	1.7
11/1	Ahead	U	-		-	-	-	251	1940	1940	12.9%	-	-	-	0.1	1.1	0.1
11/2	Ahead	U	-		-	-	-	682	2080	2080	32.8%	-	-	-	0.2	1.3	0.2
11/3	Right	U	-		-	-	-	463	1935	1935	23.9%	-	-	-	0.2	1.2	3.4
11/4	Right	U	-		-	-	-	405	1935	1935	20.9%	-	-	-	0.1	1.2	1.2
12/1	Right	U	H		1	46	-	463	1911	998	46.4%	-	-	-	2.9	22.5	7.4
12/2	Right Right2	U	H		1	46	-	405	1995	1042	38.9%	-	-	-	1.9	17.1	5.0
13/1	Right	U	G		1	22	-	29	1856	474	6.1%	-	-	-	0.4	49.4	0.8
14/1	Ahead	U	O		1	81	-	790	1830	1667	47.4%	-	-	-	0.5	2.1	5.7
15/1	Ahead	U	M		1	81	-	251	1940	1768	14.2%	-	-	-	0.1	1.2	0.2
15/2	Ahead	U	M		1	81	-	682	2080	1895	36.0%	-	-	-	0.3	1.5	0.5

C1	Stream: 1 PRC for Signalled Lanes (%):	2.0	Total Delay for Signalled Lanes (pcuHr):	47.31	Cycle Time (s):	90
C1	Stream: 2 PRC for Signalled Lanes (%):	150.1	Total Delay for Signalled Lanes (pcuHr):	0.37	Cycle Time (s):	90
C1	Stream: 3 PRC for Signalled Lanes (%):	89.9	Total Delay for Signalled Lanes (pcuHr):	0.46	Cycle Time (s):	90
C1	Stream: 4 PRC for Signalled Lanes (%):	0.0	Total Delay for Signalled Lanes (pcuHr):	0.00	Cycle Time (s):	90
	PRC Over All Lanes (%):	2.0	Total Delay Over All Lanes(pcuHr):	50.19		

Table 8b: Junction 8 (PM)

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	-	-	-		-	-	-	-	-	-	83.0%	0	0	0	49.3	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	83.0%	0	0	0	49.3	-	-
1/1	Right Ahead	U	A		1	29	-	466	1940	647	72.1%	-	-	-	4.7	36.1	11.4
1/2	Right Right2	U	A		1	29	-	482	2080	693	69.5%	-	-	-	4.6	34.5	11.6
2/1		U	-		-	-	-	260	1940	1940	13.4%	-	-	-	0.1	1.1	0.1
2/2		U	-		-	-	-	736	2080	2080	35.4%	-	-	-	0.3	1.3	0.3
3/1	Left	U	C		1	14	-	218	1732	289	75.5%	-	-	-	3.6	60.2	6.6
3/2	Ahead	U	C		1	14	-	222	1940	323	68.7%	-	-	-	3.2	52.7	6.3
3/3	Ahead	U	C		1	14	-	240	2080	347	69.2%	-	-	-	3.5	51.9	6.7
4/2+4/1		U	-		-	-	-	489	1940:1940	1940	25.2%	-	-	-	0.2	1.2	0.2
5/1		U	-		-	-	-	540	1940	1940	27.8%	-	-	-	0.2	1.3	0.2
5/2		U	-		-	-	-	897	2080	2080	43.1%	-	-	-	0.4	1.5	0.4
6/1	Left Ahead	U	B		1	32	-	476	1896	695	68.5%	-	-	-	4.3	32.2	11.1
6/2	Ahead	U	B		1	32	-	472	1940	711	66.4%	-	-	-	4.1	31.3	10.8
6/3+6/4	Ahead	U	B		1	32	-	414	2080:2080	857	48.3%	-	-	-	2.8	24.4	5.7
7/2+7/1	Left	U	D		1	18	-	421	1935:1805	507	83.0%	-	-	-	6.1	52.3	9.7
8/1		U	-		-	-	-	489	1940	1940	25.2%	-	-	-	0.2	1.2	0.2
9/1	Ahead	U	E		1	44	-	514	1940	970	53.0%	-	-	-	2.6	17.9	7.5
9/2	Ahead	U	E		1	44	-	705	2080	1040	67.8%	-	-	-	2.5	12.8	7.5
10/1	Ahead Right	U	-		-	-	-	222	1932	1932	11.5%	-	-	-	0.1	1.1	0.6
10/2	Right	U	-		-	-	-	240	1972	1972	12.2%	-	-	-	0.1	1.1	3.4
11/1	Ahead	U	-		-	-	-	260	1940	1940	13.4%	-	-	-	0.1	1.1	0.1
11/2	Ahead	U	-		-	-	-	736	2080	2080	35.4%	-	-	-	0.3	1.3	0.3
11/3	Right	U	-		-	-	-	266	1935	1935	13.7%	-	-	-	0.1	1.1	1.2
11/4	Right	U	-		-	-	-	522	1935	1935	27.0%	-	-	-	0.2	1.3	3.4
12/1	Right	U	H		1	48	-	266	1911	1040	25.6%	-	-	-	1.5	20.4	4.3
12/2	Right Right2	U	H		1	48	-	522	1994	1086	48.1%	-	-	-	2.8	19.6	7.5
13/1	Right	U	G		1	21	-	28	1856	454	6.2%	-	-	-	0.4	46.7	0.7
14/1	Ahead	U	O		1	81	-	489	1830	1667	29.3%	-	-	-	0.2	1.5	2.8
15/1	Ahead	U	M		1	81	-	260	1940	1768	14.7%	-	-	-	0.1	1.2	0.1
15/2	Ahead	U	M		1	81	-	736	2080	1895	38.8%	-	-	-	0.3	1.6	0.3

C1	Stream: 1 PRC for Signalled Lanes (%):	8.5	Total Delay for Signalled Lanes (pcuHr):	46.71	Cycle Time (s):	90
C1	Stream: 2 PRC for Signalled Lanes (%):	131.7	Total Delay for Signalled Lanes (pcuHr):	0.40	Cycle Time (s):	90
C1	Stream: 3 PRC for Signalled Lanes (%):	206.9	Total Delay for Signalled Lanes (pcuHr):	0.21	Cycle Time (s):	90
C1	Stream: 4 PRC for Signalled Lanes (%):	0.0	Total Delay for Signalled Lanes (pcuHr):	0.00	Cycle Time (s):	90
	PRC Over All Lanes (%):	8.5	Total Delay Over All Lanes(pcuHr):	49.35		

Junction 9, Arcady 9 – Roundabout Module

Table 9: Summary of Junction Performance, Junction 9

	AM									PM								
	Set ID	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity	Set ID	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity
	2020																	
Arm 1	D1	5.5	28.0	15.07	0.85	C	72.61	F	-11 % [Arm 3]	D2	6.9	35.1	15.63	0.88	C	12.36	B	6 % [Arm 1]
Arm 2		2.7	5.8	5.15	0.73	A					5.2	22.7	9.16	0.84	A			
Arm 3		98.1	161.8	214.72	1.14	F					3.8	17.6	13.69	0.80	B			

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 10, LINSIG

Table 10a: Junction 10 (AM)

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	-	-	-		-	-	-	-	-	-	**232.8%**	**5**	**127**	**0**	**783.5**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**232.8%**	**5**	**127**	**0**	**783.5**	-	-
1/1	Ahead Left	U	A		1	49	-	1275	1928	1071	119.0%	-	-	-	120.3	339.7	142.0
1/2+1/3	Right Ahead	U	A B		1	49:22	-	736	2080:1902	511	144.1%	-	-	-	129.2	631.9	138.7
3/1+3/2	Left Right Ahead	U	E	F	1	19:10	9	1278	1746:1961	549	232.8%	-	-	-	411.7	1159.6	424.7
5/1	Ahead Left	U	C		1	22	-	558	1844	471	118.4%	-	-	-	55.4	357.5	62.5
5/2	Ahead	U	C		1	22	-	629	2080	532	118.3%	-	-	-	61.9	354.4	69.9
7/1+7/2	Right Ahead	U	D		1	10	-	229	1904:1848	294	77.9%	-	-	-	3.9	61.6	5.7
8/1	Ahead	U	O		1	71	-	198	1940	1552	8.5%	-	-	-	0.1	2.0	0.5
10/1	Left	O	-		-	-	-	132	1764	574	23.0%	5	127	0	0.6	17.6	2.5
11/1	Ahead	U	O		1	71	-	361	1940	1552	23.3%	-	-	-	0.4	3.7	2.4

C1 Stream: 1 PRC for Signalled Lanes (%): -158.6 Total Delay for Signalled Lanes (pcuHr): 782.40 Cycle Time (s): 90
C1 Stream: 2 PRC for Signalled Lanes (%): 286.9 Total Delay for Signalled Lanes (pcuHr): 0.45 Cycle Time (s): 90
PRC Over All Lanes (%): -158.6 Total Delay Over All Lanes(pcuHr): 783.49

Table 10b: Junction 10 (PM)

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	-	-	-		-	-	-	-	-	-	**253.9%**	**12**	**141**	**0**	**879.0**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**253.9%**	**12**	**141**	**0**	**879.0**	-	-
1/1	Ahead Left	U	A		1	49	-	855	1927	1071	79.9%	-	-	-	5.7	24.2	18.8
1/2+1/3	Right Ahead	U	A B		1	49:18	-	866	2080:1902	402	215.7%	-	-	-	261.9	1088.8	270.8
3/1+3/2	Left Right Ahead	U	E	F	1	15:10	5	1226	1746:1968	483	253.9%	-	-	-	419.5	1231.8	431.0
5/1	Ahead Left	U	C		1	26	-	698	1846	554	126.0%	-	-	-	86.8	447.9	95.5
5/2	Ahead	U	C		1	26	-	787	2080	624	126.1%	-	-	-	97.8	447.6	107.6
7/1+7/2	Right Ahead	U	D		1	10	-	290	1904:1848	334	86.8%	-	-	-	5.8	71.6	7.4
8/1	Ahead	U	O		1	71	-	194	1940	1552	8.2%	-	-	-	0.1	2.0	0.5
10/1	Left	O	-		-	-	-	153	1764	580	26.4%	12	141	0	0.8	18.8	3.0
11/1	Ahead	U	O		1	71	-	443	1940	1552	28.5%	-	-	-	0.5	4.0	3.0

C1 Stream: 1 PRC for Signalled Lanes (%): -182.1 Total Delay for Signalled Lanes (pcuHr): 877.61 Cycle Time (s): 90
C1 Stream: 2 PRC for Signalled Lanes (%): 215.3 Total Delay for Signalled Lanes (pcuHr): 0.56 Cycle Time (s): 90
PRC Over All Lanes (%): -182.1 Total Delay Over All Lanes(pcuHr): 878.96

Junction 11, PICADY 9 – Priority Intersection Module

Table 11: Summary of Junction Performance, Junction 11

	AM									PM								
	Set ID	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity	Set ID	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity
2020																		
Stream B-AC	D1	37.7	37.7	1593.32	9999999999.00	F	107.87	F	-11 % [Stream B-AC]	D2	58.3	58.3	1578.93	9999999999.00	F	66.14	F	-14 % [Stream B-AC]
Stream C-AB		78.2	132.5	158.81	1.07	F					21.3	49.1	26.84	0.89	D			

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 12, PICADY 9 – Priority Intersection Module

Table 12: Summary of Junction Performance, Junction 12

	AM						PM					
	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020											
Stream B-ACD	D1	23.0	62075.81	61.40	F	-23 % [Stream B-ACD]	D2	18.9	2577.14	9999999999.00	F	-24 % [Stream B-ACD]
Stream A-BCD		52.7	130.71	1.04	F			143.7	359.98	1.20	F	
Stream D-ABC		3.3	50.74	0.80	F			38.0	775.39	9999999999.00	F	
Stream C-ABD		0.0	0.00	0.00	A			0.0	0.00	0.00	A	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 13, PICADY 9 – Priority Intersection Module

Table 13: Summary of Junction Performance, Junction 13

	AM						PM					
	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020											
Stream B-AC	D1	45.7	340.62	1.21	F	-23 % [Stream B-AC]	D2	228.3	59999940.00	9999999999.00	F	-38 % [Stream C-AB]
Stream C-AB		24.0	73.54	0.97	F			388.1	1539.11	1.62	F	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 14. ARCADY 9 – Roundabout Module

Table 54: Summary of Junction Performance, Junction 14

	AM						PM					
	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020											
Arm 1	D1	241.4	307.53	1.17	F	-16 % [Arm 1]	D2	4.7	7.44	0.83	A	-34 % [Arm 4]
Arm 2		4.2	7.42	0.81	A			136.5	151.04	1.10	F	
Arm 3		0.1	5.25	0.05	A			0.6	11.90	0.38	B	
Arm 4		5.6	96.20	0.90	F			339.3	5103.31	20.08	F	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 15. ARCADY 9 – Roundabout Module

Table 15: Summary of Junction Performance, Junction 15

	AM						PM					
	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020											
Arm 1	D1	1.8	4.18	0.64	A	-32 % [Arm 4]	D2	6.9	11.83	0.88	B	-8 % [Arm 4]
Arm 2		1.4	8.77	0.58	A			11.5	69.30	0.96	F	
Arm 3		0.3	8.24	0.23	A			0.5	25.33	0.36	D	
Arm 4		658.9	1073.93	1.43	F			78.3	105.41	1.06	F	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 16, LINSIG

Table 16a: Junction 16 (AM)

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	-	-	-		-	-	-	-	-	-	**335.9%**	**0**	**0**	**0**	**625.3**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**335.9%**	**0**	**0**	**0**	**625.3**	-	-
1/1	Left Ahead Right	U	E		1	9	-	699	1873	208	335.9%	-	-	-	278.4	1433.9	285.5
2/1		U	-		-	-	-	578	1940	1940	16.6%	-	-	-	0.1	1.1	0.1
4/1+4/2	Right Left Ahead	U	C D		1	31:12	-	835	1902:1891	732	114.0%	-	-	-	66.0	284.5	80.4
6/2+6/1	Ahead Right Left	U	F		1	9	-	738	2032:1687	258	286.1%	-	-	-	272.8	1330.6	281.4
8/1+8/2	Left Ahead Right	U	A B		1	31:12	-	677	1904:1920	793	85.3%	-	-	-	8.0	42.7	15.7

C1 PRC for Signalled Lanes (%): -273.2 PRC Over All Lanes (%): -273.2 Total Delay for Signalled Lanes (pcuHr): 625.20 Total Delay Over All Lanes(pcuHr): 625.30 Cycle Time (s): 90

Table 16b: Junction 16 (PM)

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	-	-	-		-	-	-	-	-	-	**258.6%**	**0**	**0**	**0**	**543.2**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**258.6%**	**0**	**0**	**0**	**543.2**	-	-
1/1	Left Ahead Right	U	E		1	9	-	441	1844	205	215.2%	-	-	-	135.3	1104.6	140.2
2/1		U	-		-	-	-	583	1940	1940	18.3%	-	-	-	0.1	1.1	0.1
4/1+4/2	Right Left Ahead	U	C D		1	32:12	-	889	1885:1891	755	117.7%	-	-	-	82.4	333.8	97.7
6/2+6/1	Ahead Right Left	U	F		1	8	-	604	2026:1687	234	258.6%	-	-	-	211.0	1257.6	217.9
8/1+8/2	Left Ahead Right	U	A B		1	32:12	-	973	1899:1920	780	124.7%	-	-	-	114.4	423.2	129.5

C1 PRC for Signalled Lanes (%): -187.4 PRC Over All Lanes (%): -187.4 Total Delay for Signalled Lanes (pcuHr): 543.13 Total Delay Over All Lanes(pcuHr): 543.25 Cycle Time (s): 90

Junction 17

Table 17a: Junction 17 (AM)

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	-	-	-		-	-	-	-	-	-	**178.5%**	**0**	**0**	**0**	**301.7**	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	**178.5%**	**0**	**0**	**0**	**301.7**	-	-
1/1	Ahead Left	U	A		1	44	-	458	1865	933	49.1%	-	-	-	2.4	18.7	8.0
1/2	Ahead	U	A		1	44	-	522	2080	1040	50.2%	-	-	-	2.7	18.5	9.2
1/3	Right	U	B		1	18	-	105	1981	418	25.1%	-	-	-	1.0	35.3	2.3
2/1	Ahead Left	U	E		1	11	-	443	1861	248	178.5%	-	-	-	113.3	920.6	119.0
2/2	Right	U	E		1	11	-	179	1857	248	72.3%	-	-	-	3.1	62.7	5.5
3/1	Left Ahead	U	C		1	42	-	1130	1927	921	122.7%	-	-	-	123.3	392.9	140.8
3/2	Right	U	D		1	18	-	509	1995	421	120.9%	-	-	-	54.7	386.6	61.8
4/1		U	-		-	-	-	307	1940	1940	12.2%	-	-	-	0.1	1.1	0.1
5/1		U	-		-	-	-	1235	1940	1940	53.6%	-	-	-	0.6	2.0	0.6
6/1		U	-		-	-	-	286	1940	1940	14.5%	-	-	-	0.1	1.1	0.1
6/2		U	-		-	-	-	825	2080	2080	33.3%	-	-	-	0.2	1.3	0.2
7/1		U	-		-	-	-	693	1940	1940	31.2%	-	-	-	0.2	1.3	0.2

C1 PRC for Signalled Lanes (%): -98.4 PRC Over All Lanes (%): -98.4 Total Delay for Signalled Lanes (pcuHr): 300.49 Total Delay Over All Lanes(pcuHr): 301.70 Cycle Time (s): 90

Table 17b: Junction 17 (PM)

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	-	-	-		-	-	-	-	-	-	114.0%	0	0	0	117.3	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	114.0%	0	0	0	117.3	-	-
1/1	Ahead Left	U	A		1	41	-	619	1904	889	69.7%	-	-	-	4.4	25.6	13.3
1/2	Ahead	U	A		1	41	-	686	2080	971	70.7%	-	-	-	4.8	25.4	14.7
1/3	Right	U	B		1	14	-	79	1981	330	23.9%	-	-	-	0.9	39.7	1.9
2/1	Ahead Left	U	E		1	18	-	436	1864	394	110.8%	-	-	-	32.0	264.4	38.2
2/2	Right	U	E		1	18	-	122	1857	392	31.1%	-	-	-	1.2	36.6	2.8
3/1	Left Ahead	U	C		1	39	-	905	1924	855	105.8%	-	-	-	40.4	160.6	55.9
3/2	Right	U	D		1	14	-	379	1995	332	114.0%	-	-	-	32.3	306.5	37.4
4/1		U	-		-	-	-	291	1940	1940	14.1%	-	-	-	0.1	1.1	0.1
5/1		U	-		-	-	-	954	1940	1940	46.8%	-	-	-	0.4	1.7	0.4
6/1		U	-		-	-	-	514	1940	1940	26.4%	-	-	-	0.2	1.3	0.2
6/2		U	-		-	-	-	972	2080	2080	45.4%	-	-	-	0.4	1.6	0.4
7/1		U	-		-	-	-	495	1940	1940	23.1%	-	-	-	0.2	1.2	0.2

C1 PRC for Signalled Lanes (%): -26.6 PRC Over All Lanes (%): -26.6 Total Delay for Signalled Lanes (pcuHr): 116.03 Total Delay Over All Lanes(pcuHr): 117.29 Cycle Time (s): 90

Junction 18. ARCADY 9 – Roundabout Module

Table 18: Summary of Junction Performance, Junction 18

	AM						PM					
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020											
Arm 1	D1	159.9	704.38	1.29	F	-66 %	D2	4.2	21.63	0.81	C	-52 %
Arm 2		28.6	67.53	1.00	F	[Arm 3]		1102.1	2448.97	1.78	F	[Arm 3]
Arm 3		1646.8	7097.59	3.07	F			578.7	2963.51	1.87	F	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 19. ARCADY 9 – Roundabout Module

Table 19: Summary of Junction Performance, Junction 19

	AM						PM					
	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020											
Arm 1	D1	0.0	2.75	0.02	A	34 %	D2	0.0	3.51	0.02	A	69 %
Arm 2		1.2	5.57	0.54	A	[Arm 3]		0.7	5.10	0.41	A	[Arm 2]
Arm 3		2.5	6.43	0.72	A			0.5	2.57	0.34	A	
Arm 4		0.1	2.29	0.09	A			0.7	3.29	0.40	A	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 20, PICADY 9 – Priority Intersection Module

Table 20: Summary of Junction Performance, Junction 20

	AM						PM					
	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020											
Stream B-AC	D1	0.8	20.08	0.45	C	19 %	D2	0.4	11.78	0.26	B	61 %
Stream C-AB		0.0	7.48	0.03	A	[Stream B-AC]		0.0	6.54	0.05	A	[Stream B-AC]

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 21. ARCADY 9 – Roundabout Module

Table 21: Summary of Junction Performance, Junction 21

	AM						PM					
	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020											
Arm 1	D1	99.3	253.09	1.18	F	-13 %	D2	2.4	8.98	0.71	A	-3 %
Arm 2		7.0	13.81	0.88	B			24.7	40.47	0.98	E	
Arm 3		46.6	67.67	1.02	F	[Arm 1]		30.9	50.51	1.00	F	[Arm 3]
Arm 4		1.4	8.30	0.59	A			0.6	4.53	0.36	A	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met

Junction 22, LINSIG

Table 22a: Junction 22 (AM)

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	-	-	-		-	-	-	-	-	-	465.8%	0	178	0	745.7	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	465.8%	0	178	0	745.7	-	-
1/1	Left Ahead	U	B		1	11	-	1203	1937	258	465.8%	-	-	-	533.6	1596.9	544.0
1/2	Right	U	C		1	11	-	274	1891	252	108.7%	-	-	-	19.1	250.4	22.8
2/1		U	-		-	-	-	1083	1940	1940	51.4%	-	-	-	0.5	1.9	0.5
2/2		U	-		-	-	-	922	1940	1940	41.8%	-	-	-	0.4	1.6	0.4
3/2+3/1	Right Left Ahead	U	D M		1	10:50	-	199	2040:1860	385	51.7%	-	-	-	2.0	35.7	3.5
4/1	Ahead	U	N		1	76	-	235	1940	1660	12.2%	-	-	-	0.1	1.3	0.1
5/2+5/1	Ahead Left	U+O	E -		1	35	-	897	1940:1764	785	114.2%	0	178	0	70.9	284.7	116.7
5/3+5/4	Ahead Right	U	E		1	35	-	977	2080:1891	855	114.3%	-	-	-	77.4	285.2	92.3
7/2+7/1	Left Ahead	U	A L		1	7:21	-	508	2080:1774	529	96.0%	-	-	-	12.1	85.5	17.5
7/3	Right	U	A		1	7	-	212	1872	166	127.4%	-	-	-	29.4	498.5	32.1
8/1		U	-		-	-	-	572	1940	1940	27.1%	-	-	-	0.2	1.3	0.2
9/1	Ahead	U	N		1	76	-	199	1940	1660	12.0%	-	-	-	0.1	2.3	0.8
10/1		U	-		-	-	-	235	1940	1940	10.4%	-	-	-	0.1	1.0	0.1

C1 Stream: 1 PRC for Signalled Lanes (%): -417.6 Total Delay for Signalled Lanes (pcuHr): 744.41 Cycle Time (s): 90
C1 Stream: 2 PRC for Signalled Lanes (%): 637.0 Total Delay for Signalled Lanes (pcuHr): 0.20 Cycle Time (s): 90
PRC Over All Lanes (%): -417.6 Total Delay Over All Lanes(pcuHr): 745.74

Table 22b: Junction 22 (PM)

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	-	-	-		-	-	-	-	-	-	476.8%	1	190	0	827.1	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	476.8%	1	190	0	827.1	-	-
1/1	Left Ahead	U	B		1	15	-	1642	1937	344	476.8%	-	-	-	732.5	1605.9	746.8
1/2	Right	U	C		1	15	-	322	1891	336	95.8%	-	-	-	9.4	104.9	14.1
2/1		U	-		-	-	-	763	1940	1940	38.7%	-	-	-	0.3	1.5	0.3
2/2		U	-		-	-	-	723	1940	1940	36.1%	-	-	-	0.3	1.5	0.3
3/2+3/1	Right Left Ahead	U	D M		1	10:46	-	267	2047:1860	484	55.2%	-	-	-	2.4	31.7	3.8
4/1	Ahead	U	N		1	76	-	206	1940	1660	10.2%	-	-	-	0.1	1.2	0.1
5/2+5/1	Ahead Left	U+O	E -		1	31	-	719	1940:1764	703	102.2%	1	190	0	23.9	119.8	36.2
5/3+5/4	Ahead Right	U	E		1	31	-	791	2080:1891	766	103.3%	-	-	-	29.2	133.0	42.1
7/2+7/1	Left Ahead	U	A L		1	7:25	-	305	2080:1774	602	50.7%	-	-	-	3.0	35.0	5.4
7/3	Right	U	A		1	7	-	205	1872	166	123.2%	-	-	-	25.7	450.5	28.3
8/1		U	-		-	-	-	625	1940	1940	32.0%	-	-	-	0.2	1.4	0.2
9/1	Ahead	U	N		1	76	-	267	1940	1660	16.1%	-	-	-	0.2	2.4	1.2
10/1		U	-		-	-	-	206	1940	1940	8.7%	-	-	-	0.0	1.0	0.0

C1 Stream: 1 PRC for Signalled Lanes (%): -429.8 Total Delay for Signalled Lanes (pcuHr): 825.96 Cycle Time (s): 90
C1 Stream: 2 PRC for Signalled Lanes (%): 459.5 Total Delay for Signalled Lanes (pcuHr): 0.23 Cycle Time (s): 90
PRC Over All Lanes (%): -429.8 Total Delay Over All Lanes(pcuHr): 827.08

Junction 23. ARCADY 9 – Roundabout Module

Table 23: Summary of Junction Performance, Junction 23

	AM						PM					
	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020											
Arm 1	D1	447.7	1006.73	1.42	F	-28 % [Arm 1]	D2	18.4	42.50	0.97	E	-25 % [Arm 3]
Arm 2		4.2	8.73	0.81	A			5.8	10.85	0.86	B	
Arm 3		30.7	91.83	1.02	F			319.6	983.90	1.60	F	
Arm 4		44.5	277.87	1.19	F			24.0	199.83	1.08	F	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met

Junction 24. PICADY 9 – Priority Intersection Module

Table 24: Summary of Junction Performance, Junction 24

	AM						PM					
	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020											
Stream B-AC	D1	267.9	59999940.00	9999999999.00	F	-35 % [Stream C-AB]	D2	193.6	2795.58	9999999999.00	F	-24 % [Stream B-AC]
Stream C-AB		469.4	1374.84	1.56	F			138.2	409.20	1.24	F	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 25. PICADY 9 – Priority Intersection Module

Table 25: Summary of Junction Performance, Junction 25

	AM						PM					
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020											
Stream B-AC	D1	0.1	8.06	0.10	A	67 %	D2	0.4	11.16	0.29	B	77 %
Stream C-AB		0.9	5.36	0.30	A	[Stream C-AB]		0.3	5.61	0.15	A	[Stream B-AC]

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Junction 26. PICADY 9 – Priority Intersection Module

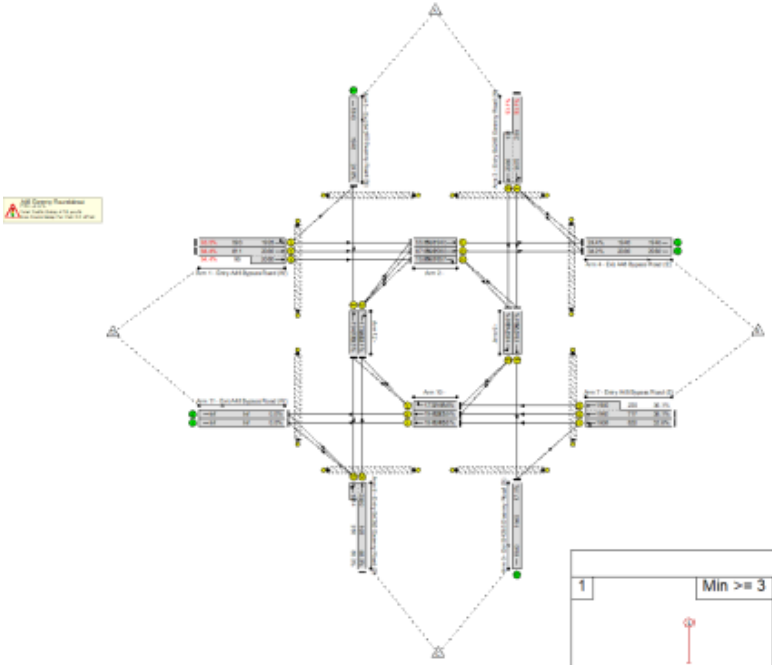
Table 26: Summary of Junction Performance, Junction 26.

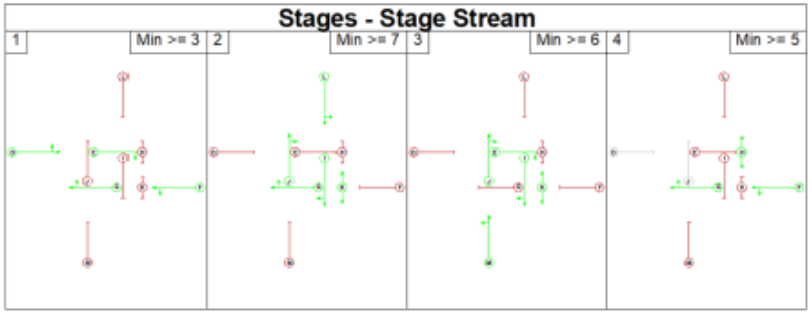
	AM						PM					
	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
	2020											
Stream B-ACD	D1	0.2	10.16	0.19	B	-6 %	D2	0.3	11.68	0.23	B	2 %
Stream A-BCD		0.2	4.81	0.09	A			0.2	5.60	0.10	A	
Stream D-AB		0.2	20.43	0.18	C	[Stream D-BC]		0.3	14.20	0.20	B	[Stream D-BC]
Stream D-BC		4.6	52.22	0.84	F			2.3	32.60	0.71	D	
Stream C-ABD		0.3	5.13	0.12	A			0.6	4.31	0.18	A	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Network Diagrams for LINSIG Models of Signalised Junctions

Figure A: Network Layout Diagram, Junction 4





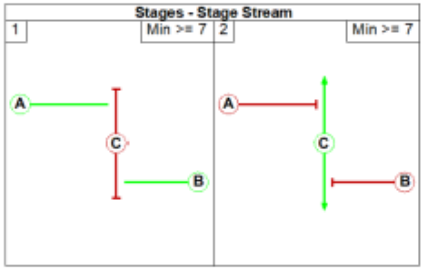


Figure B: Network Layout Diagram, Junction 5

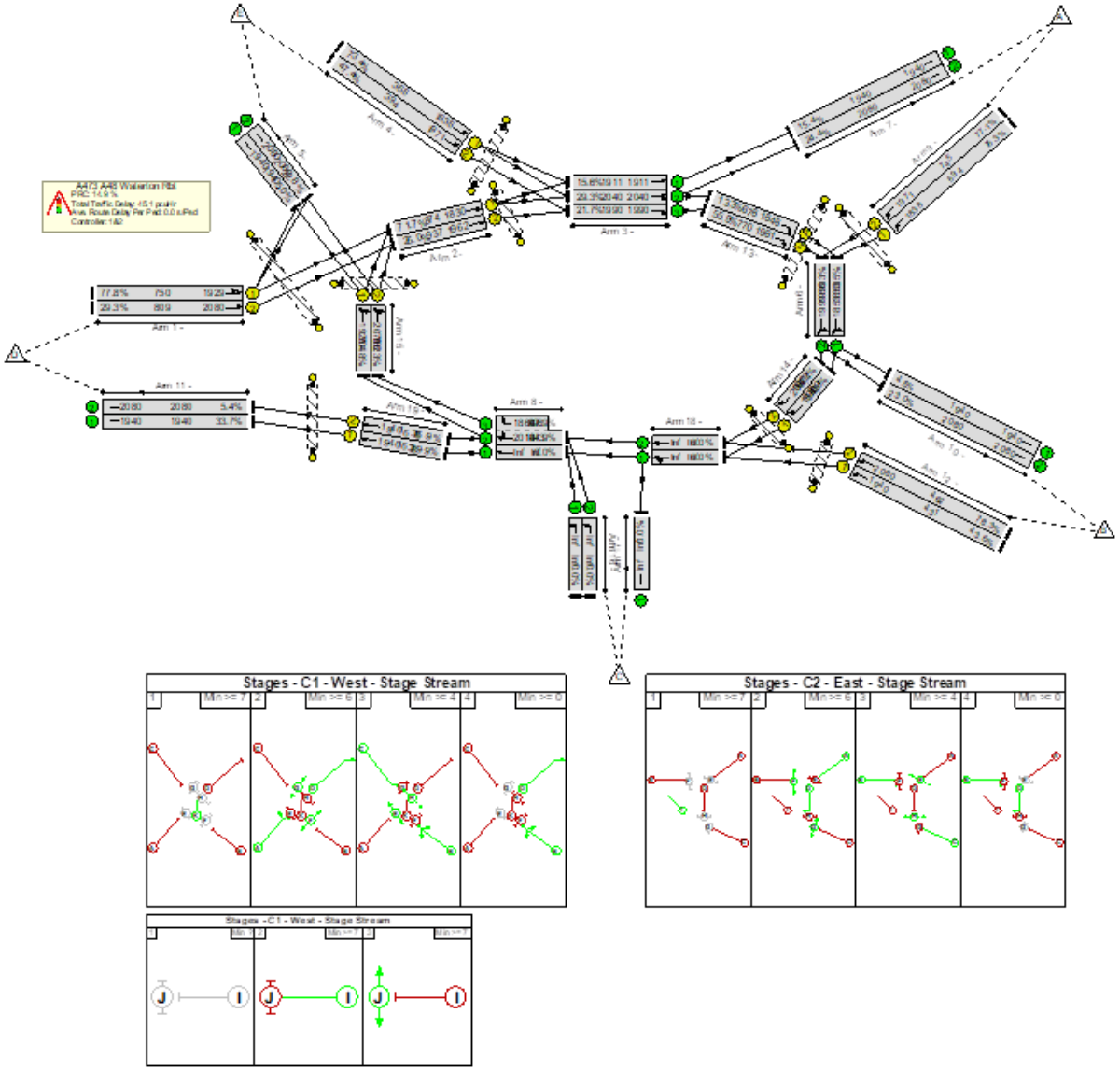
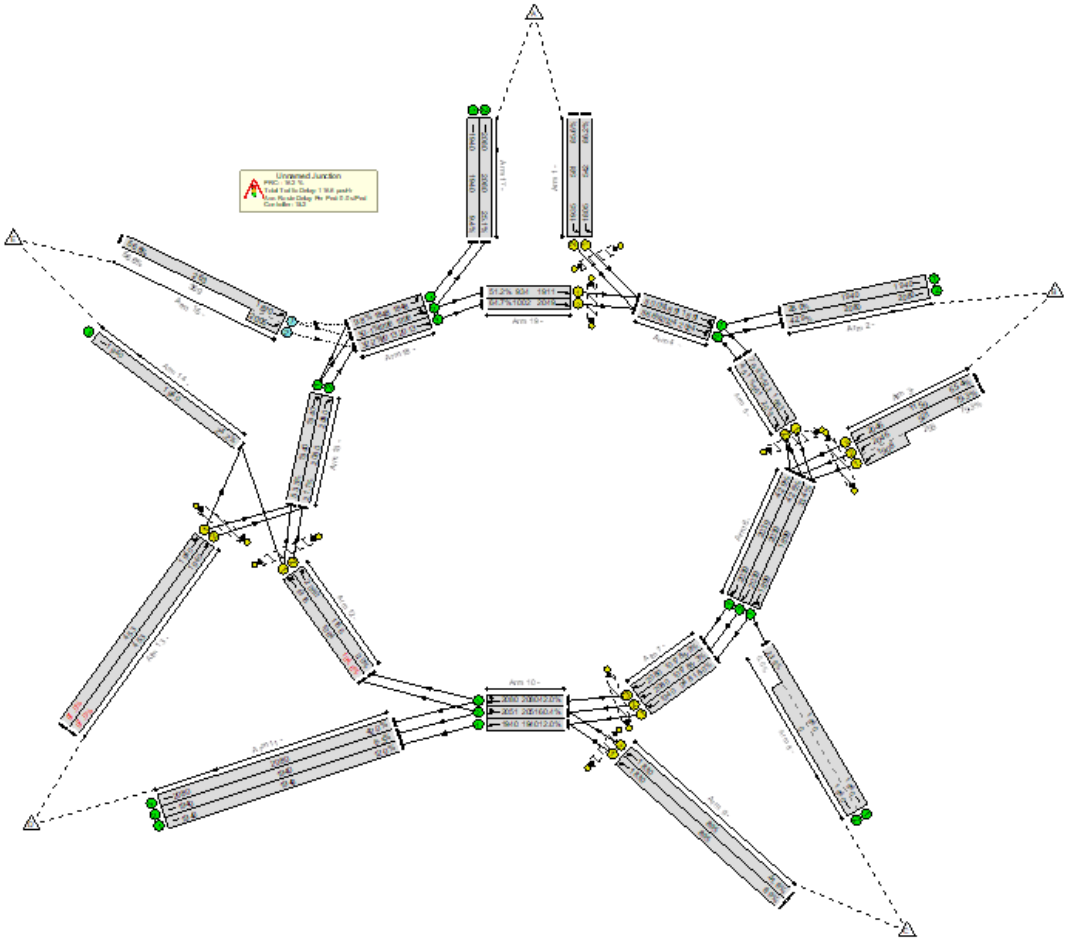


Figure C: Network Layout Diagram, Junction 6



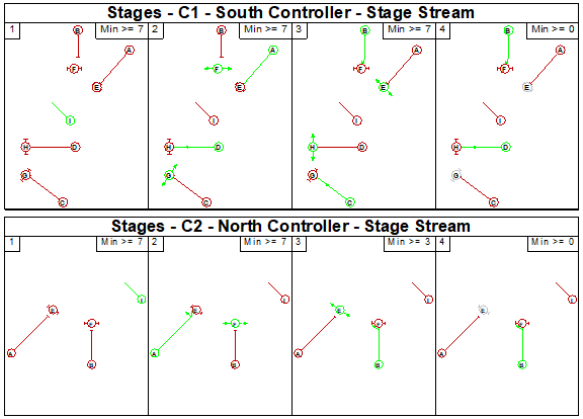


Figure D: Network Layout Diagram, Junction 8

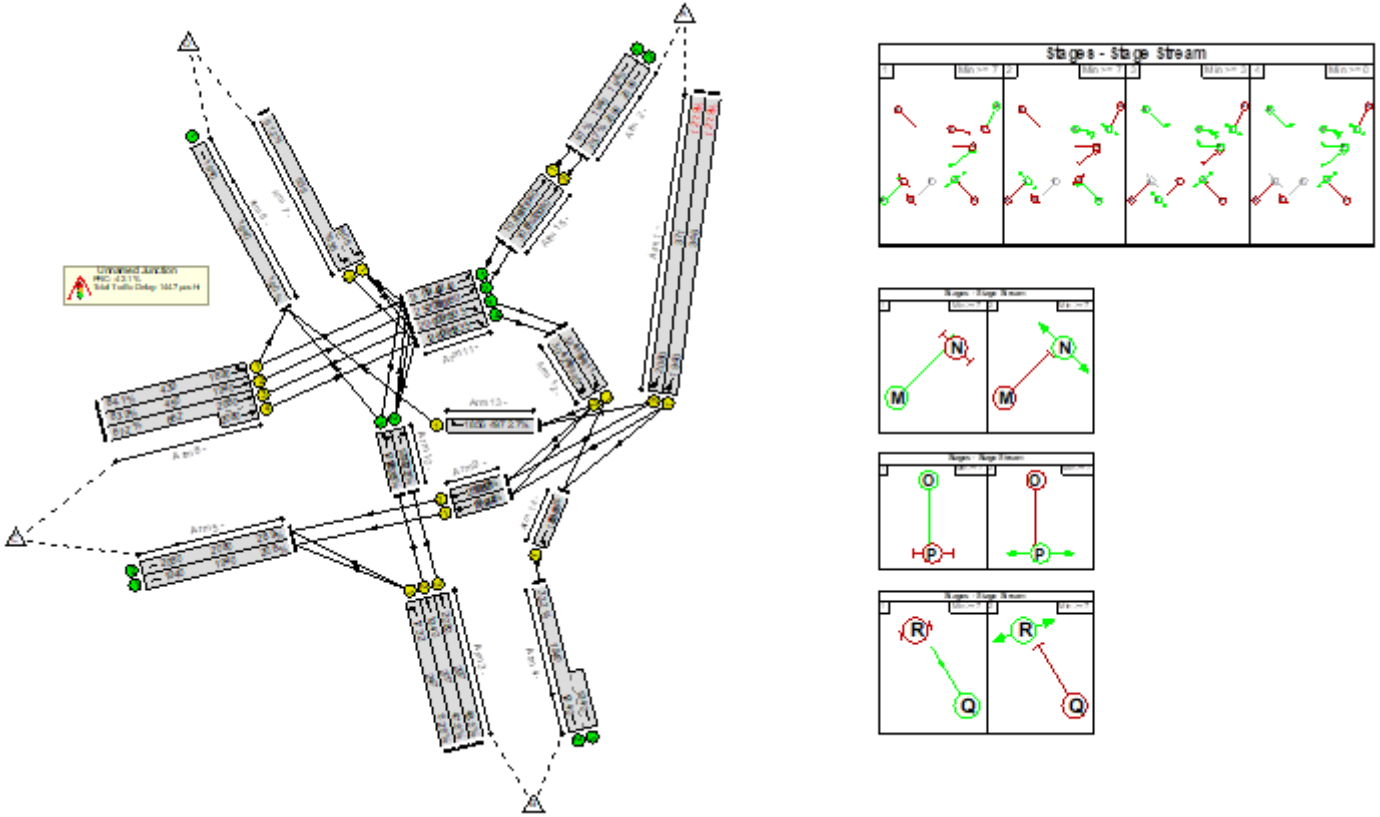


Figure E: Network Layout Diagram, Junction 10

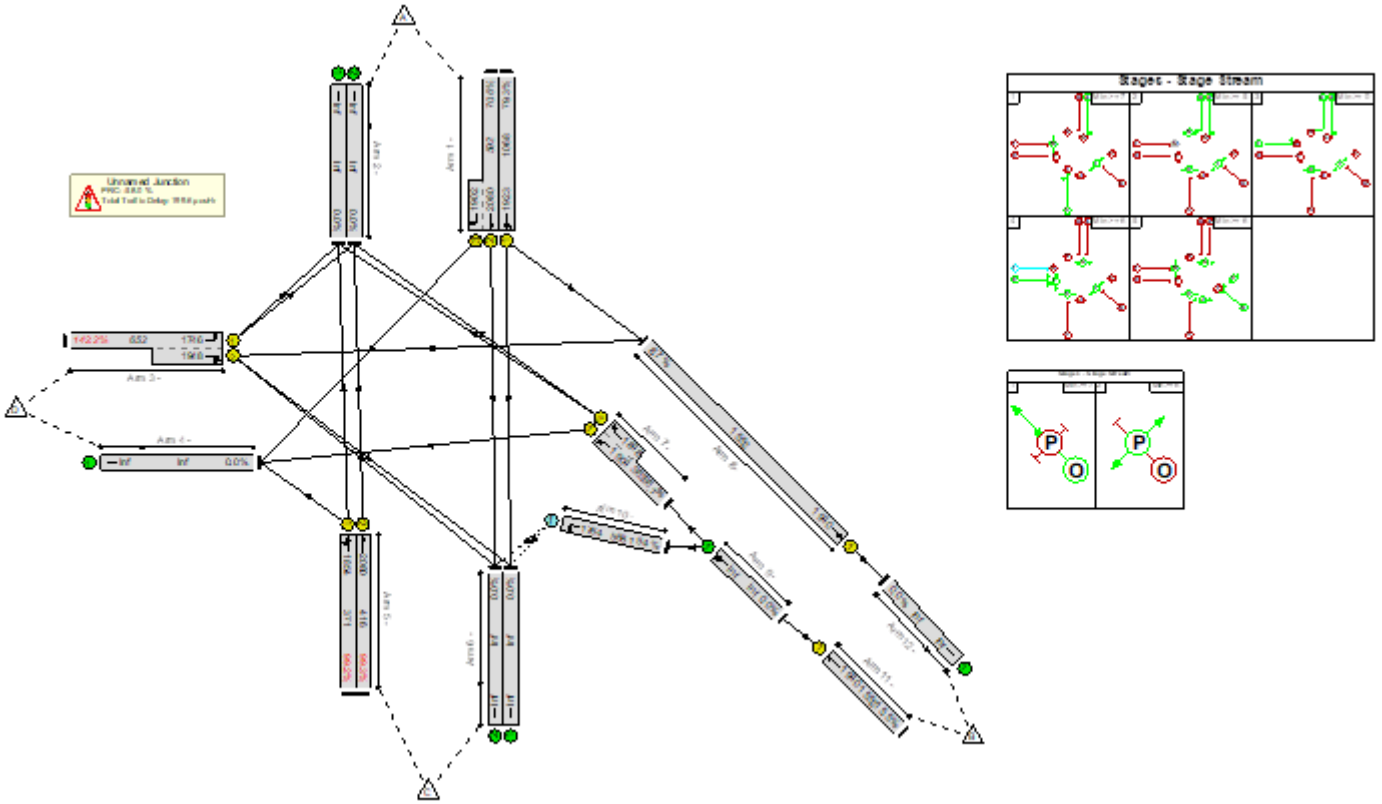
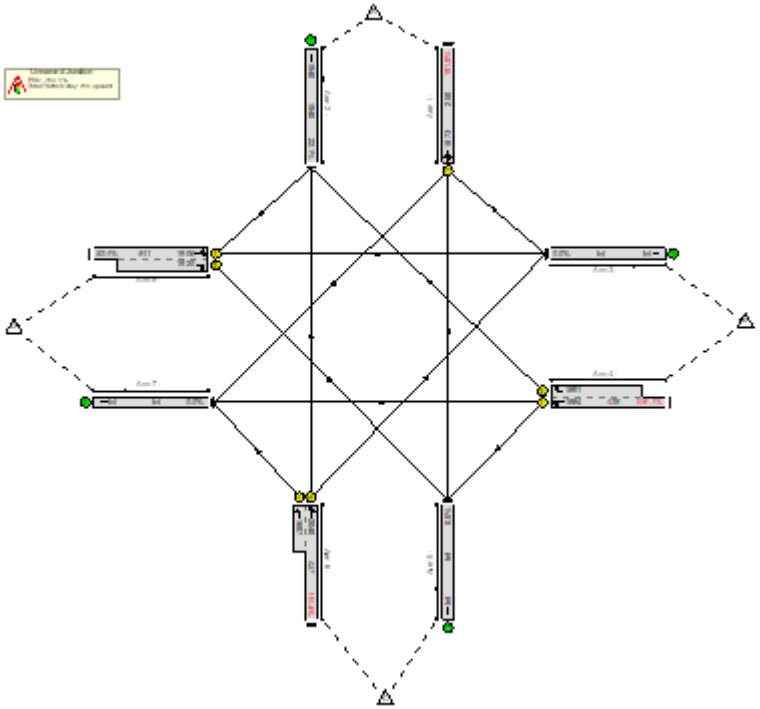


Figure F: Network Layout Diagram, Junction 16



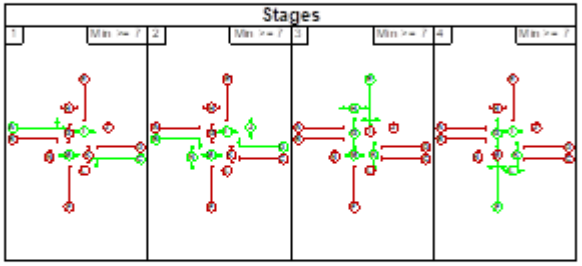
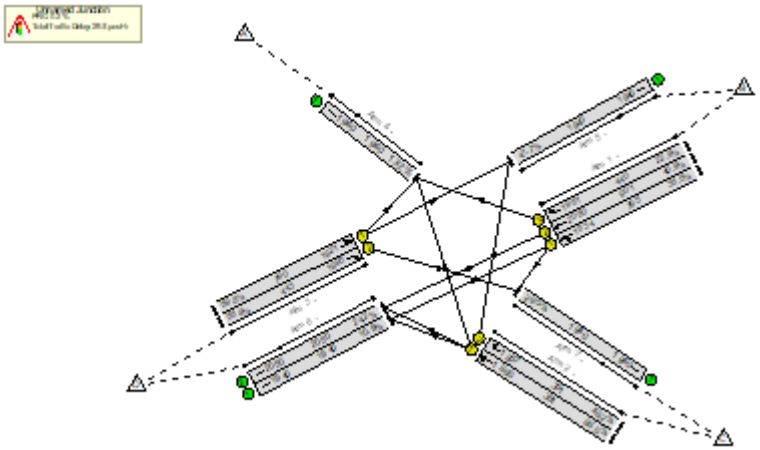


Figure G: Network Layout Diagram, Junction 17



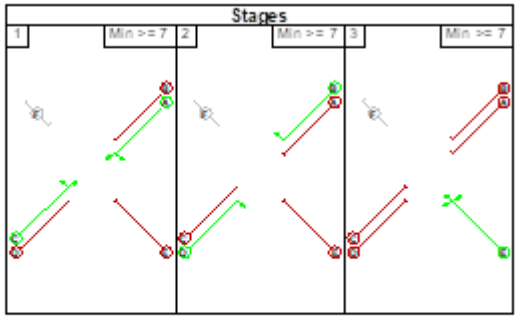
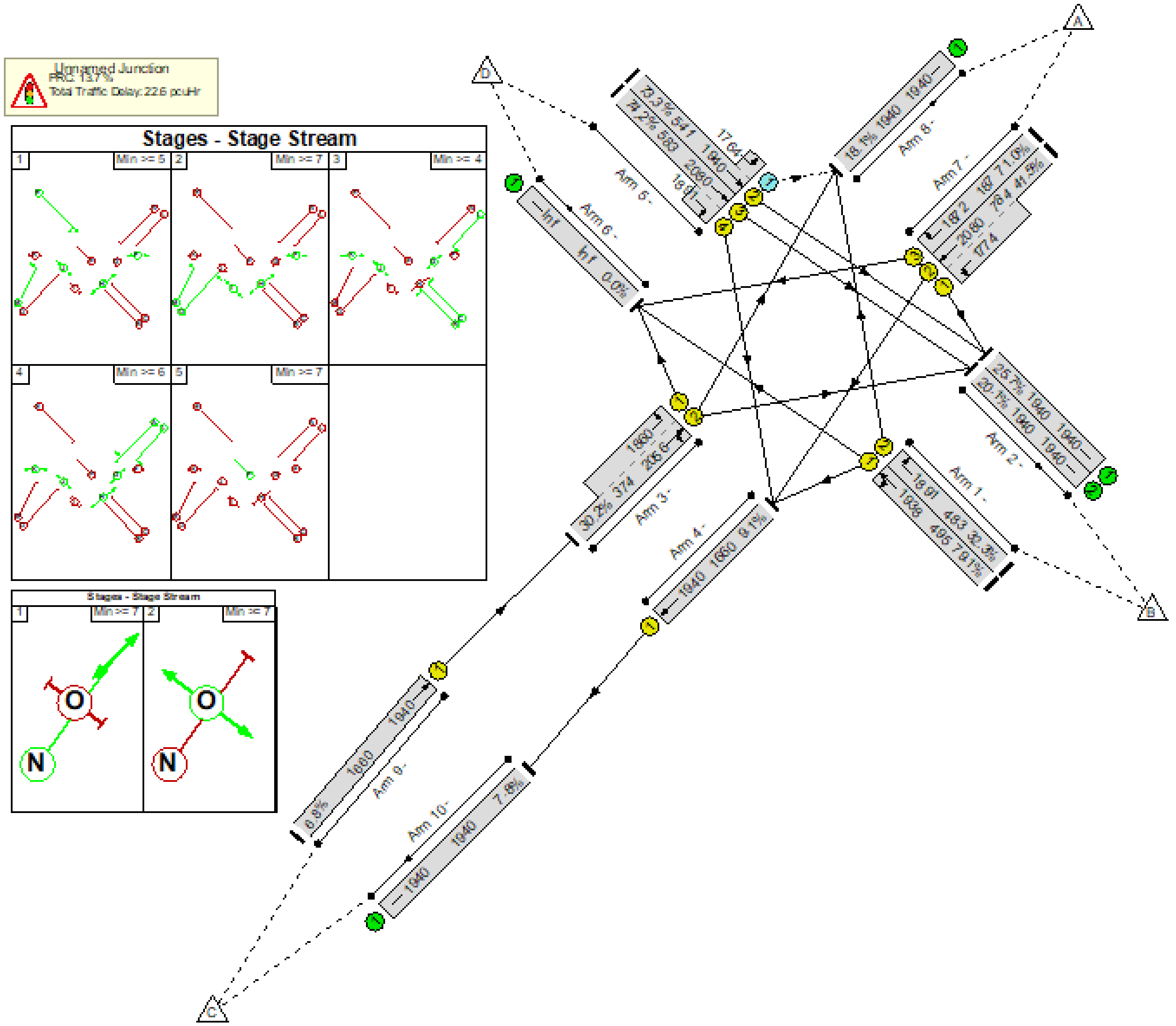


Figure H: Network Layout Diagram, Junction 22



MOTT MACDONALD

Bridgend Replacement Local Development Plan

Technical Note Series

Project:	Bridgend Replacement LDP		
Our reference:	100415574 – TN 005	**Your reference:**	
Prepared by:	Claudia Currie	**Date:**	May 2021
Approved by:	Claudia Currie	**Checked by:**	Margaret Henderson
Subject:	Assessment of the Impact of Seasonal Variation on Porthcawl (A48, A4106 and A2229).		

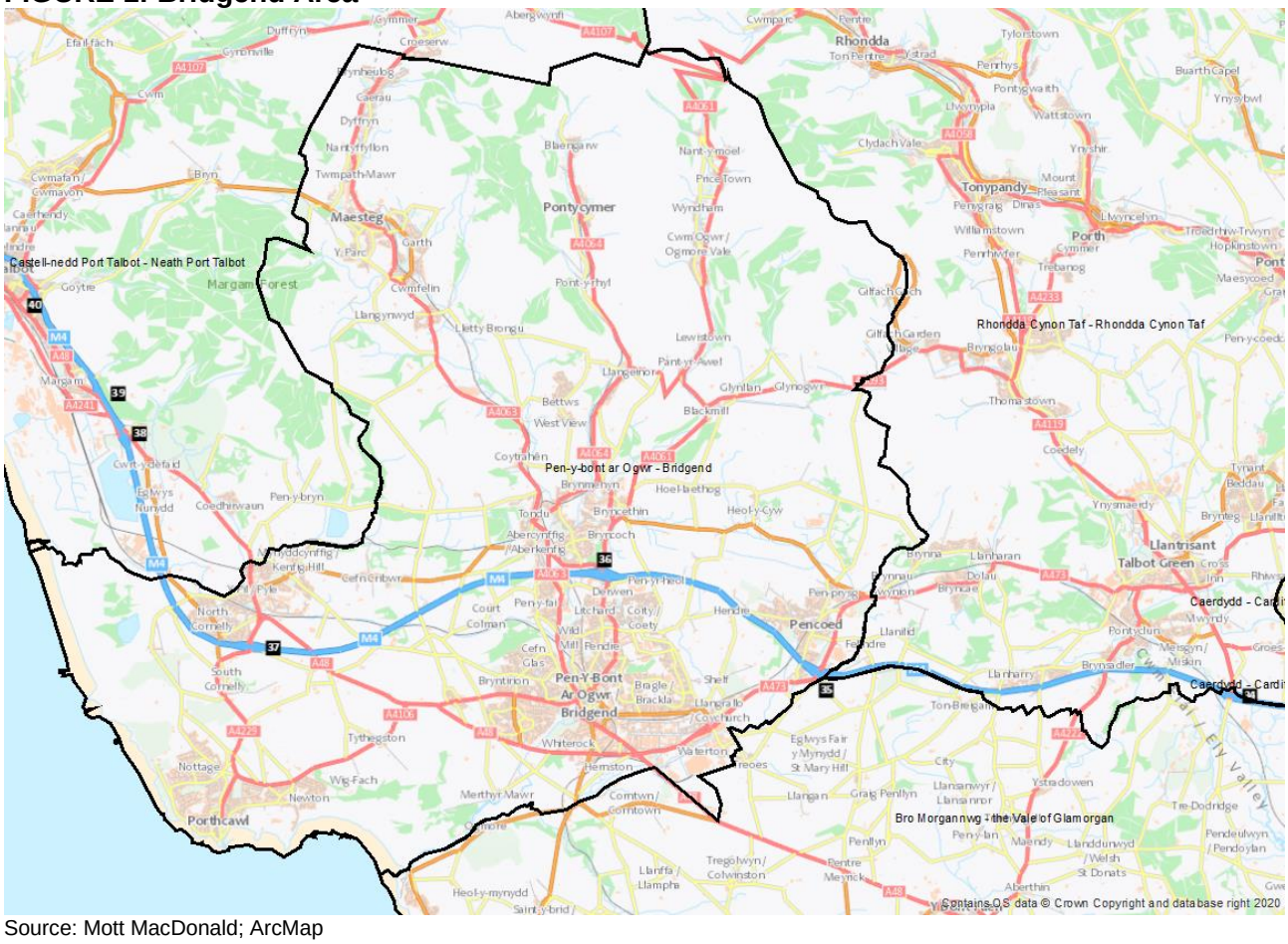
1 Introduction

Mott MacDonald was commissioned in January 2020 by Bridgend County Borough Council (BCBC) to develop a series of technical notes to help determine the traffic impact on the highway network as part of evidence base supporting the Local Plan development process.

This technical note will establish the level of impact caused by the seasonal variation of traffic flows in the Porthcawl area (A48, A4106 and A2229) and the surrounding highway network.

The Bridgend County Borough Council area is shown in Figure 1, overleaf.

FIGURE 1: Bridgend Area



Source: Mott MacDonald; ArcMap

2 Traffic Data

The traffic data collected in August 2019 for the Porthcawl area, supplied by BCBC, included a number of junction counts and automatic counters which have been supplied to Mott MacDonald to help establish the hourly flow profiles and to determine if a significant seasonal variation in traffic flows was occurring.

The availability of directly comparable data is limited to a 12 hour survey on a Thursday in August 2019 and October 2020. The October 2020 traffic data is detailed in Technical Note 1. The August 2019 data was collected by Redstart on behalf of BCBC in the during the week 17th to 23rd August 2019 and included both vehicle flows and speeds. The August Bank Holiday Monday in 2019 was Monday 26th August.

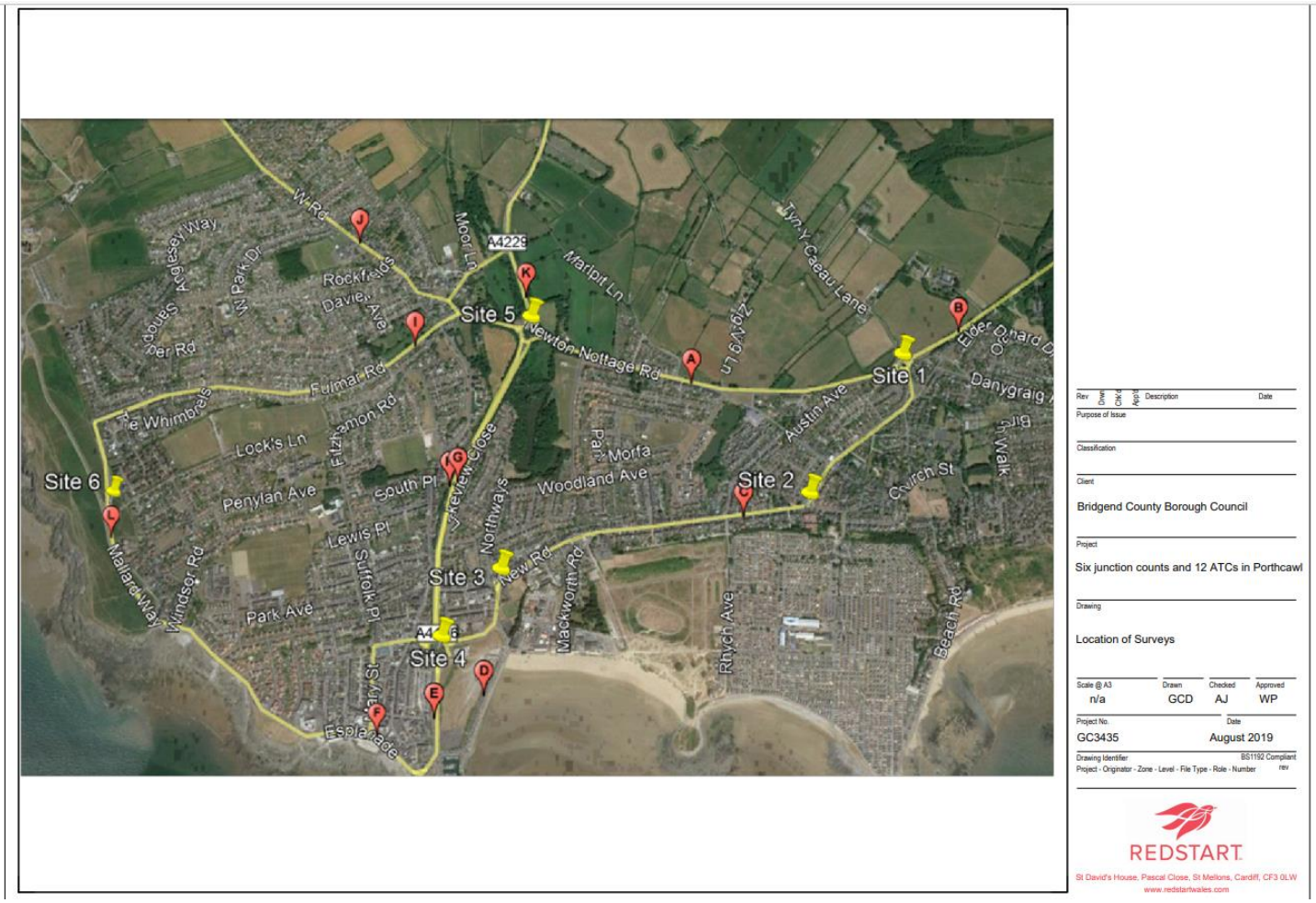
Traffic Wales, who hold all Welsh Government traffic data, have been contacted to for historic count data for the BCBC area and have confirmed that none is available for any of the last 5 years.

Transport for Wales has also been contacted, and have supplied INRIX data for the key routes in Porthcawl, to demonstrate the effects of congestion through the proxy data sets of vehicle speeds and journey times.

3 Data Analysis

Thursday traffic flow data has been extracted from the three automatic traffic count (ATC) sites, K, A, G and H, as shown in Figure 2, so that the data could be compared to the October 2020 data for the Pyle Rd/A4106 Newton Nottage Rd/A4106/Fulmar Rd junction (Site 1 – see Technical Notes 1, 3 and 4) on the same day of the week.

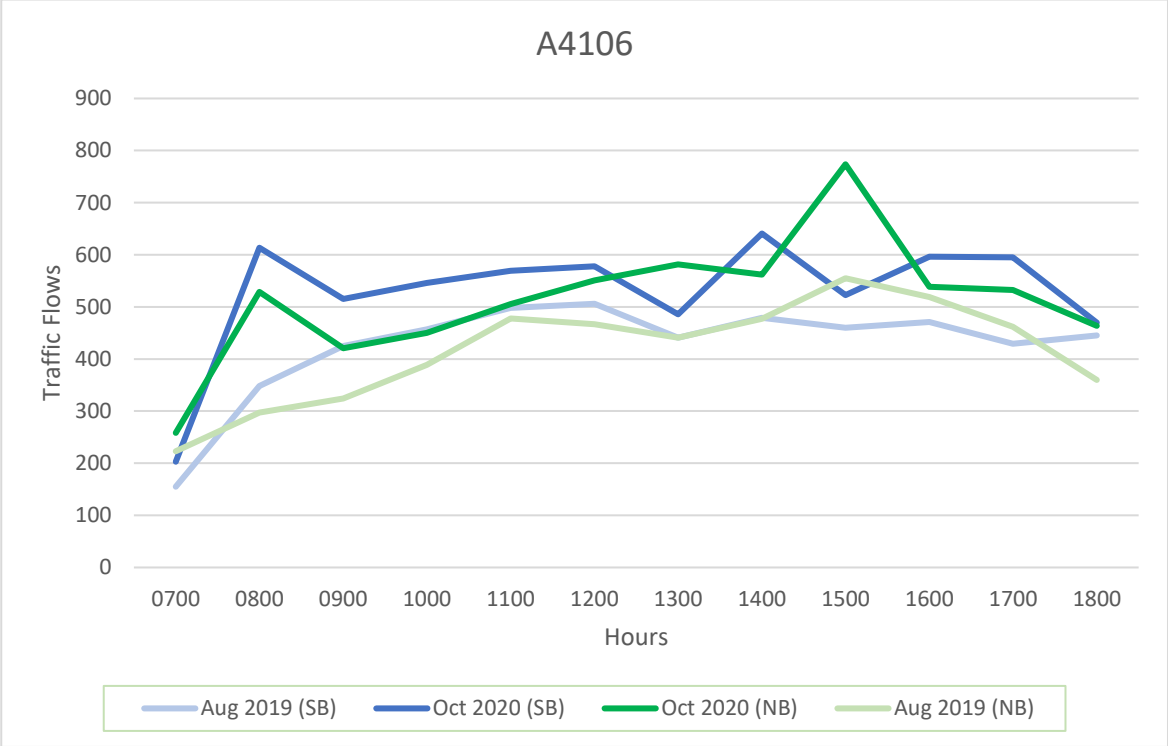
Figure 2: Traffic Count locations 2019



Source: Bridgend County Borough Council

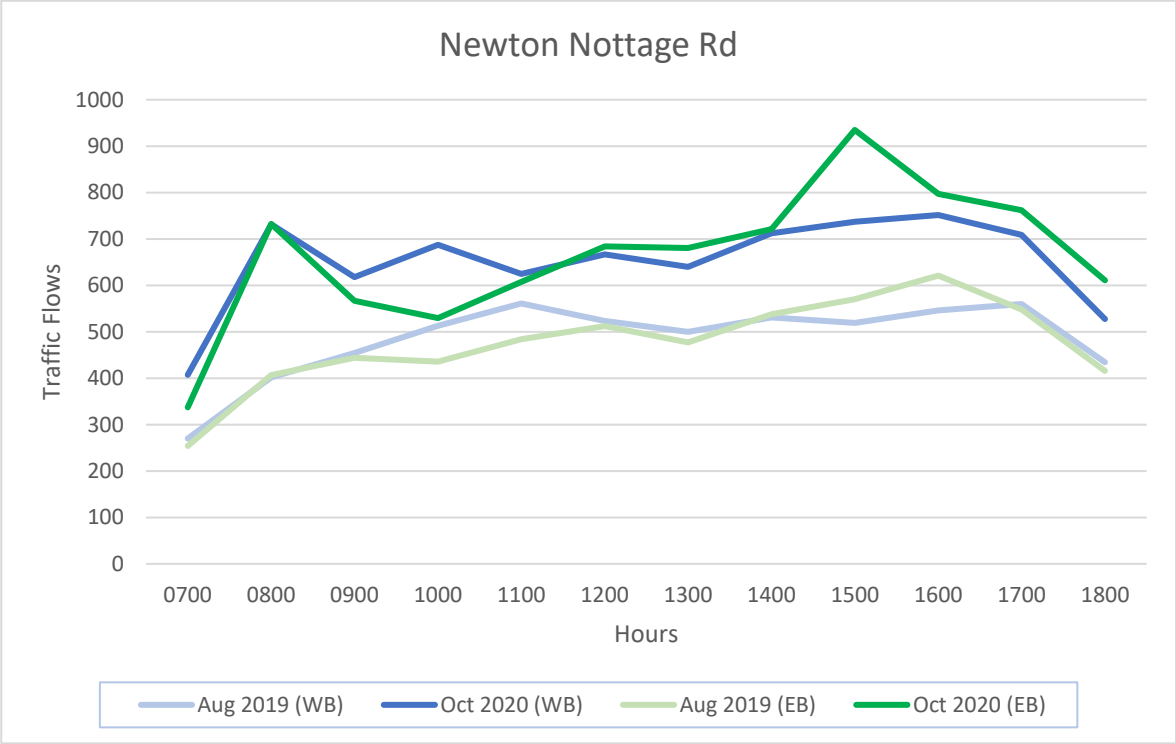
Figures 3, 4 and 5 show the difference in traffic flow numbers and profile for the August 2019 data and the COVID uplifted 2020 data. These figures show that the uplifted October traffic peak hour flows exceed the August peak hour flows, although they do occasionally occur at different times of the day.

Figure 3: Observed August and October COVID Factored Traffic Flow Data - A4106



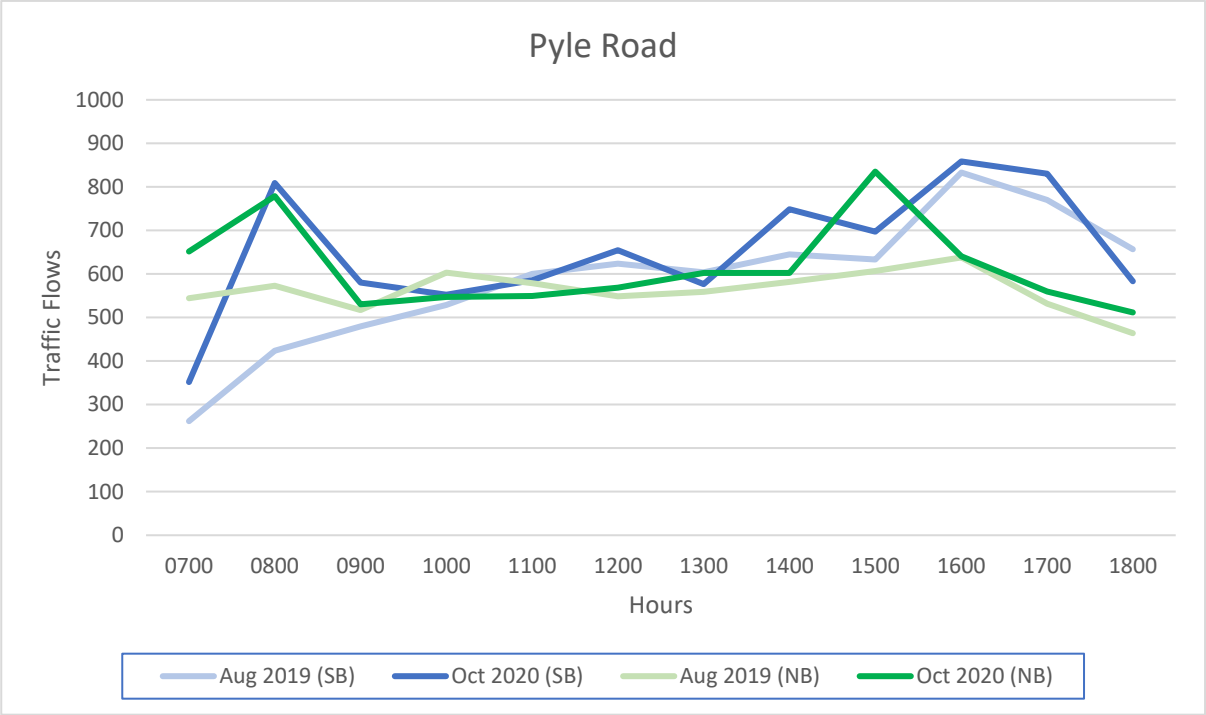
Source: Mott MacDonald and Bridgend County Borough Council Note: SB= Southbound; NB= Northbound

Figure 4: Observed August and October COVID Factored Traffic Flow Data - Newton Nottage Road



Source: Mott MacDonald and Bridgend County Borough Council Note: WB= Westbound; EB= Eastbound

Figure 5: Observed August and October COVID Factored Traffic Flow Data - Pyle Road

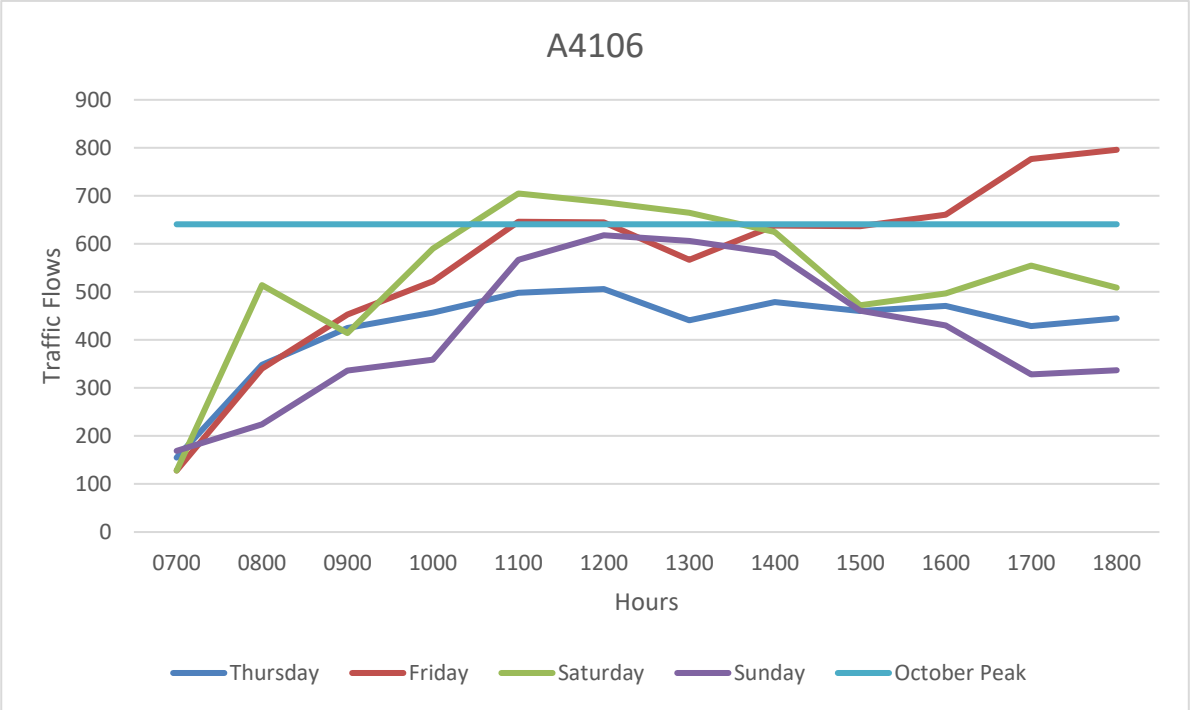


Source: Mott MacDonald and Bridgend County Borough Council Note: SB= Southbound; NB= Northbound

Therefore, any conclusions drawn from the traffic modelling detailed in Technical Notes 2 and 3 would cover the majority of the seasonal variation in flows due to tourist traffic. The highway proposals developed in Technical Note 7 would therefore also be able to accommodate the seasonal traffic levels in the BCBC area.

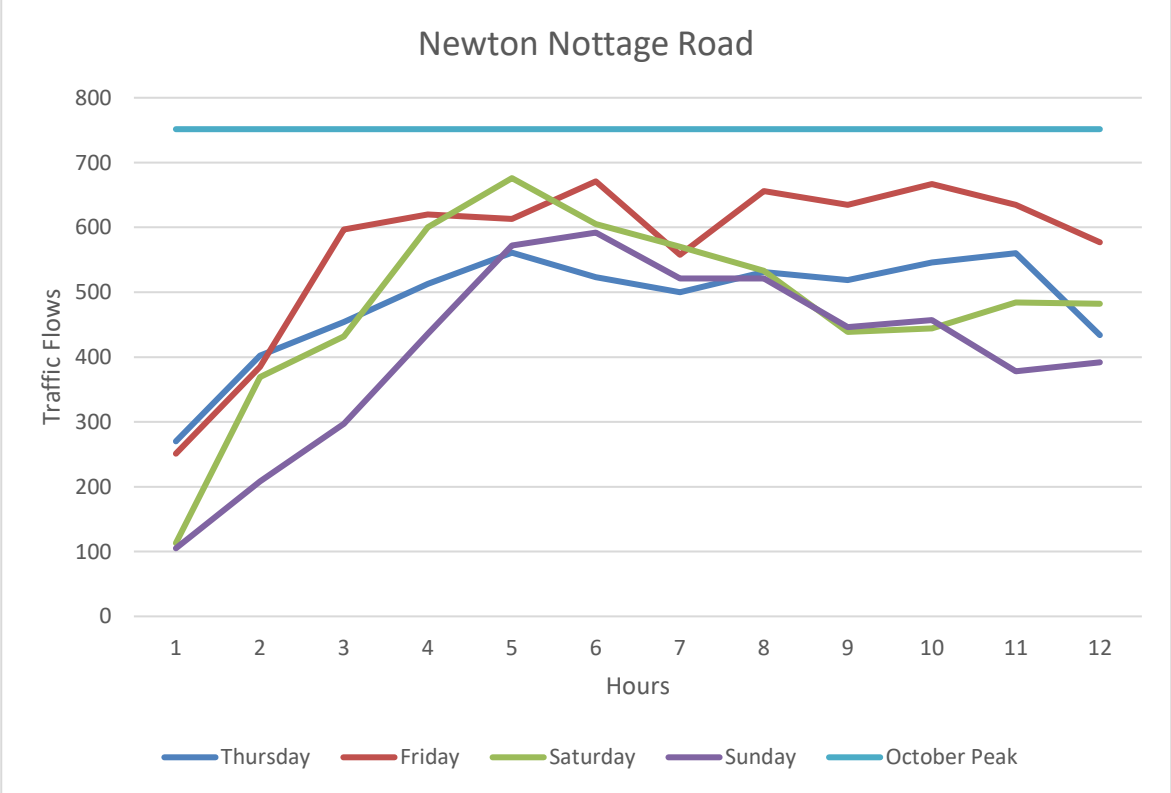
Further analysis of the ATC data inbound at these sites shown in Figures 6, 7 and 8 illustrates the variation in traffic flows leading into the 2019 August Bank Holiday and confirms that the base year peak hour traffic modelling detailed in Technical Note 2 can be reasonably extrapolated to cover most of the seasonal effects of peak tourist traffic seen in this area of the BCBC. It is important to note that these August flows were collected in the lead up to the Bank Holiday weekend in 2019 when the weather was recorded as warm and dry and are therefore likely to be on the high side. As shown in the graphs below the flows vary considerably over the weekend period (Thursday to Sunday) and given this level of fluctuation it would be impracticable to attempt to cater for the highest possible flows, as this would require significant over engineering of highway solutions to accommodate for a short term intermittent seasonal peak. The corresponding traffic speeds also indicate that traffic remains fairly free flowing with averages speeds on these routes on these survey days remaining comfortably between 30 to 40mph.

Figure 6: Observed 2019 August Traffic Flow Data - A4106 - northbound



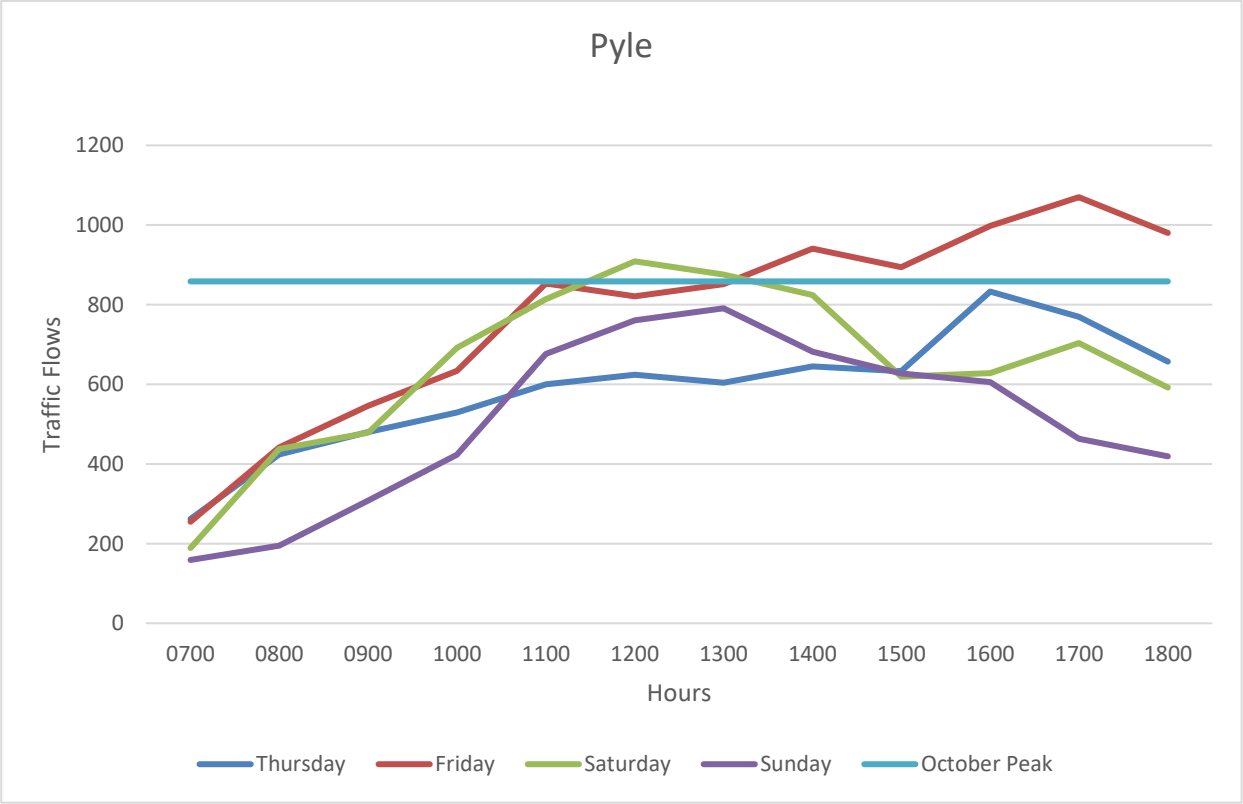
Source: Mott MacDonald and Bridgend County Borough Council

Figure 7: Observed 2019 August Traffic Flow Data - Newton Nottage Road westbound



Source: Mott MacDonald and Bridgend County Borough Council

Figure 8: Observed 2019 August Traffic Flow Data - Pyle Road southbound



Source: Mott MacDonald and Bridgend County Borough Council

Traffic summaries provided by Transport for Wales (TfW) for speed and journey times, also confirm that the traffic flow peak levels for the wider surrounding area are broadly similar in October and August as shown in Appendix B. This data covers the two routes used, which are outlined below:

- M4 route – Porthcawl town centre to Junction 36 via A4229
- A48 route – Porthcawl town centre to Bridgend town via A48 and A4106

For the following time periods:

- Comparison between August and October 2019 (whole month - average day)
- Comparison of a Saturday
- Comparison of an average weekend (Mon – Thurs)

The TfW data confirms that generally similar travel patterns and timings are shown along both routes for August and October.

4 Conclusion

Technical Note 5 has summarised the available data used to establish the level of fluctuation in traffic flows that can be attributed to the seasonal increases due to tourist traffic. It has been shown that the COVID uplifted peak hour traffic flow levels are a reasonable proxy for the general

seasonal effects as the observed August peak hours are similar in volume to the modelled flows, although the peaks do occur at different times of the day.

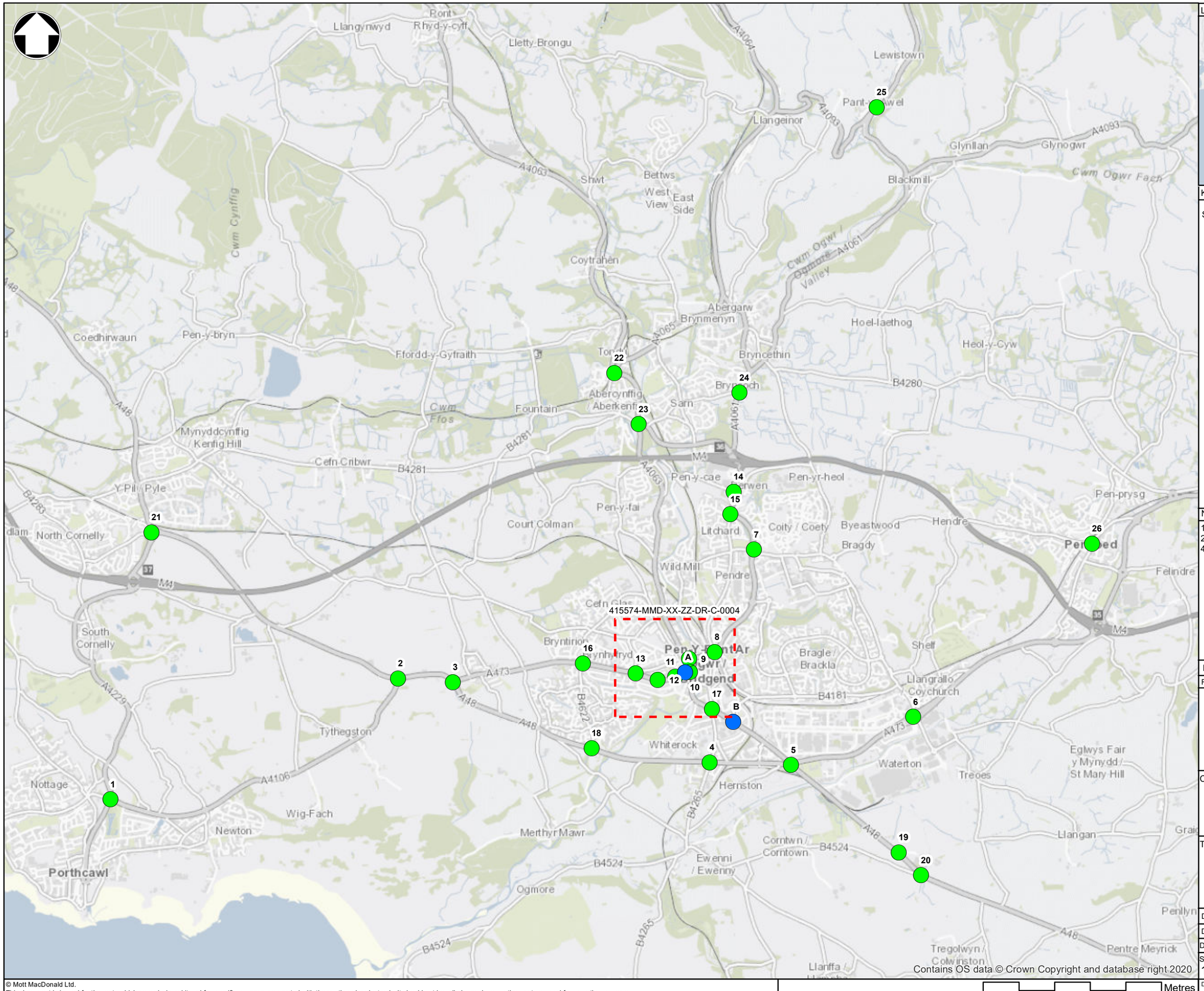
Therefore the traffic modelling reported in Technical Notes 3 (baseline) and 4 (future year) can also be used to determine the level of congestion expected at the key junctions as a result of the peak tourist flows.

Traffic flows on special event days, such as the Elvis festival, and exceptionally good weather days at the weekend may experience some short lived delays.

5 Recommendation

No additional traffic modelling is needed as it has been established from the Porthcawl data that the COVID19 uplifted peak hour flow levels provide a robust assessment of the operation of the BCBC highway network with seasonal flows in place. The TfW data also confirms that August and October speeds and journey times are significantly similar and that the seasonal variation effect is negligible.

Appendix A – Survey Locations for Junction Modelling



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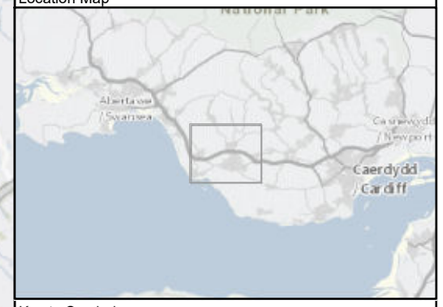
Location Map



Key to Symbols

Survey locations

- ATC
- JTC

Notes

1. For information only.
2. To be read in conjunction with: 415574-MMD-XX-ZZ-DR-C-0004

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	25/01/21	JW	For information	MH	CC

MOTT MACDONALD

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2 Callaghan Square
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Client: Bridgend County Borough Council

Title: Bridgend Traffic Survey Scoping Survey Locations

Designed	J Wu	JW	Eng. Check	M Henderson	MH
Drawn	J Wu	JW	Coordination	M Henderson	MH
Dwg Check	J Keane	JK	Approved	C Currie	CC

Scale at A3	Status	Rev	Security
1:50,000	INF	P1	STD

Drawing Number: 415574-MMD-XX-ZZ-DR-C-0003

Metres: 0 500 1,000 1,500 2,000 2,500

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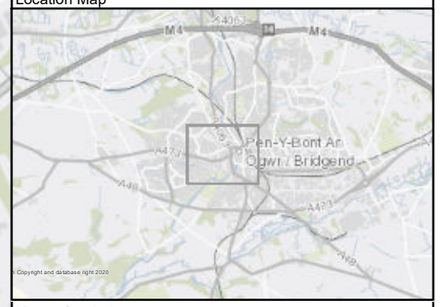
Location Map



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Survey locations

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Notes

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Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	25/01/21	JW	For information	MH	CC

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Dwg Check	J Keane	JK	Approved	C Currie	CC

Scale at A3	Status	Rev	Security
1:5,000	INF	P1	STD

Drawing Number: 415574-MMD-XX-ZZ-DR-C-0004

Metres: 0 50 100 150 200 250

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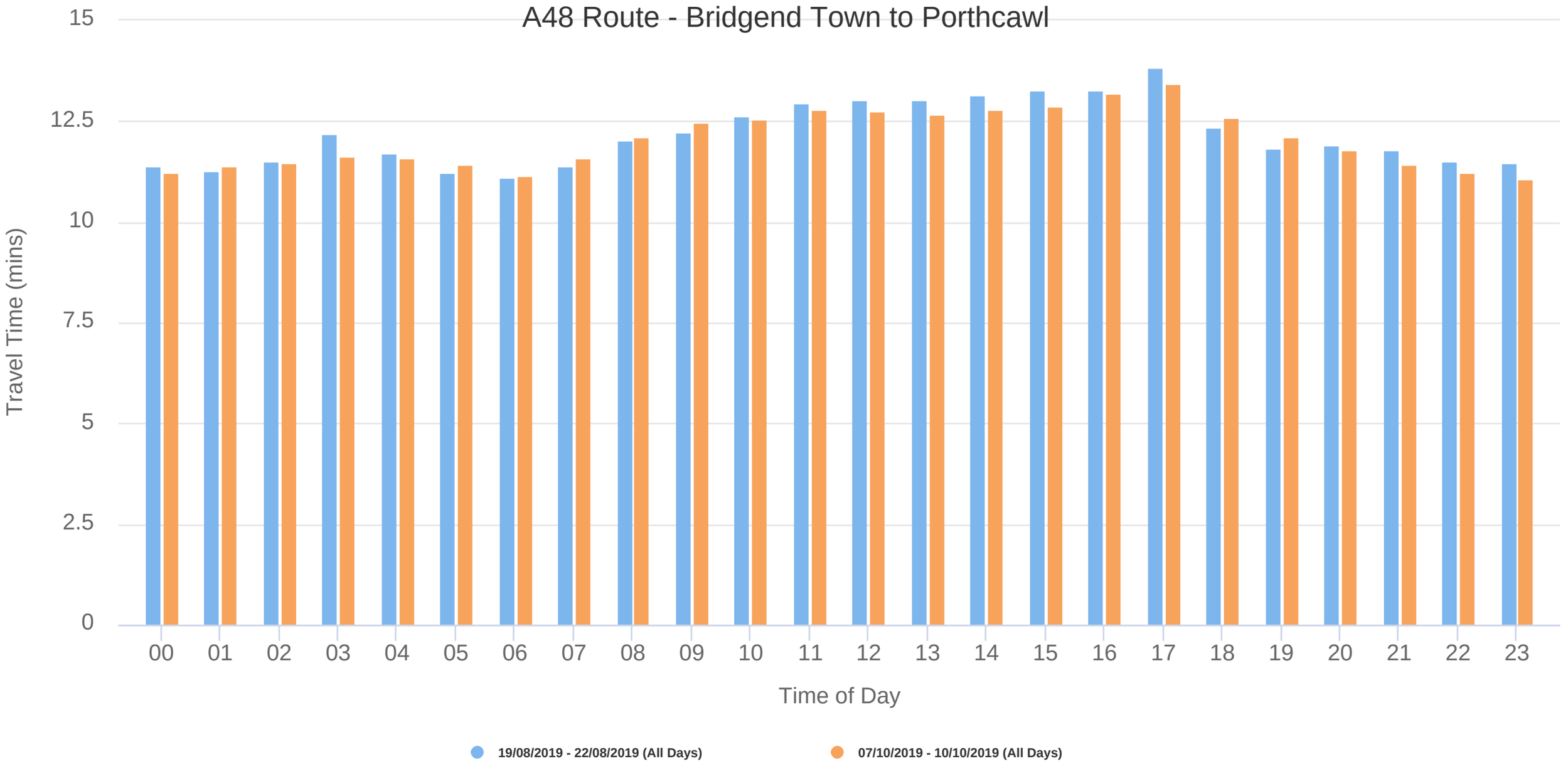
Appendix B – Speed and Journey Time Data for the Wider BCBC area supplied by Transport for Wales


A48 Route - Bridgend Town to Porthcawl
Travel Time (mins)
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12.5
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7.5
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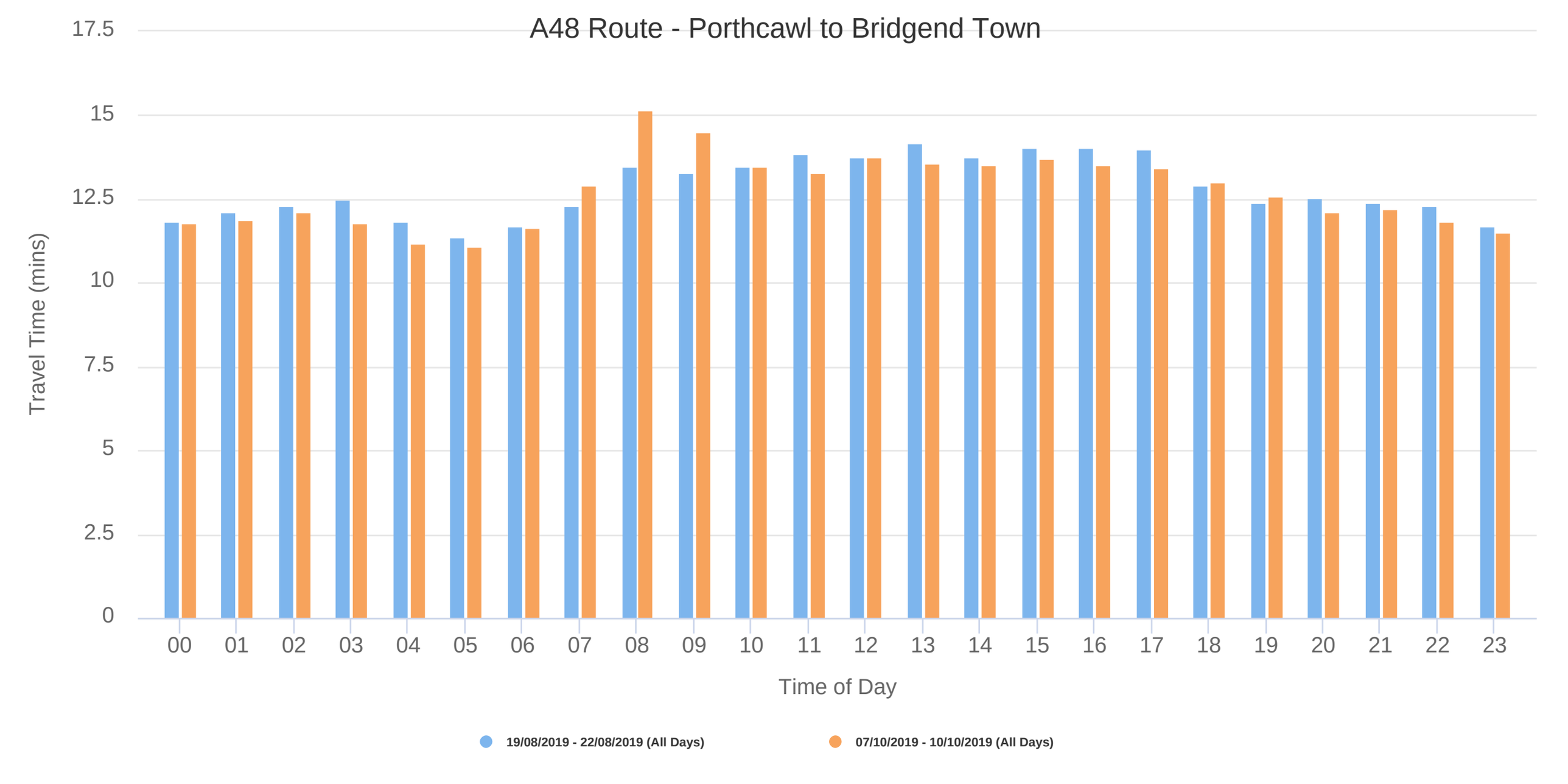
Time of Day
19/08/2019 - 22/08/2019 (All Days)
07/10/2019 - 10/10/2019 (All Days)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Travel Time (mins)
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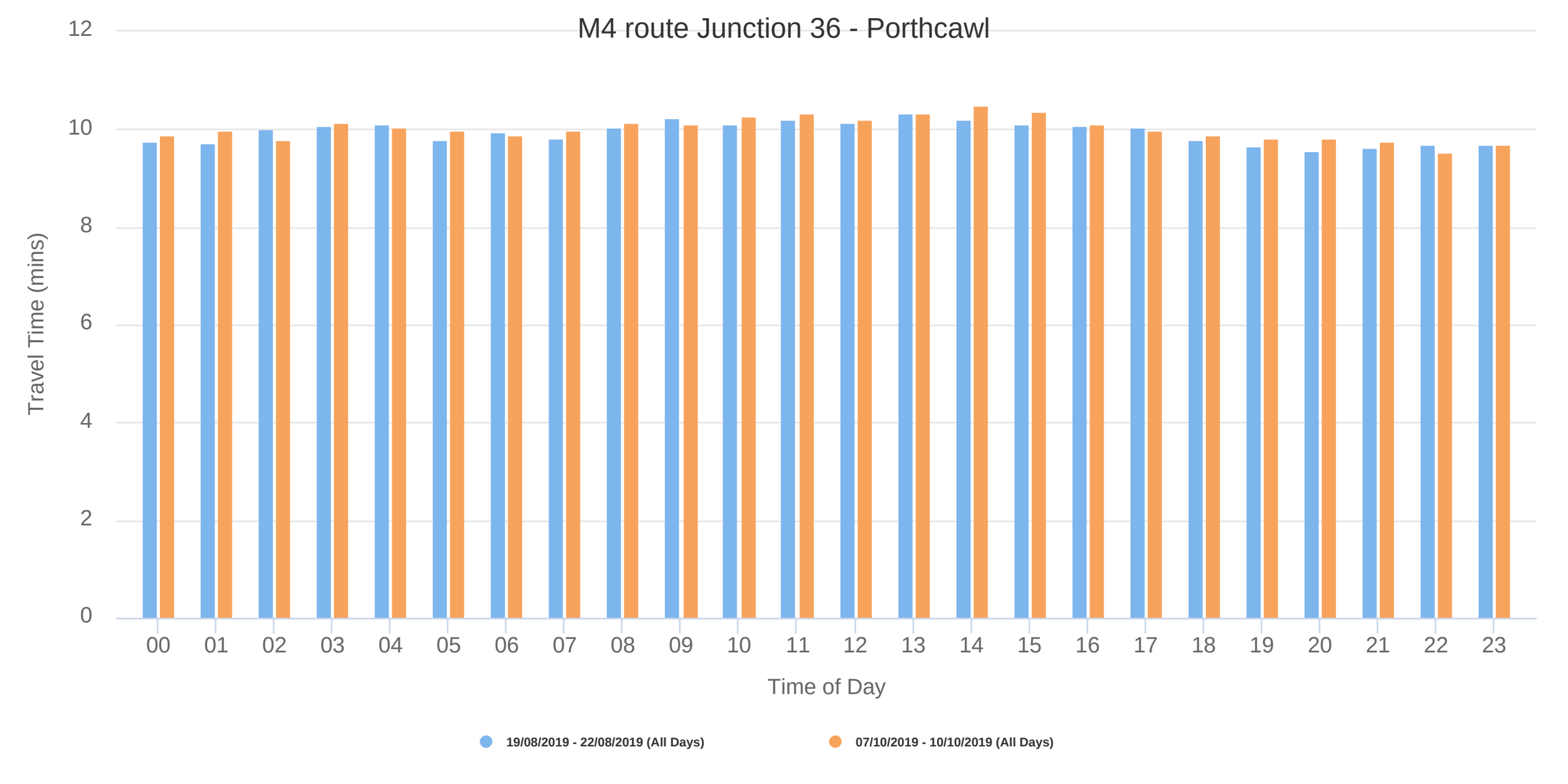
Time of Day
19/08/2019 - 22/08/2019 (All Days)
07/10/2019 - 10/10/2019 (All Days)


M4 route Junction 36 - Porthcawl
Travel Time (mins)
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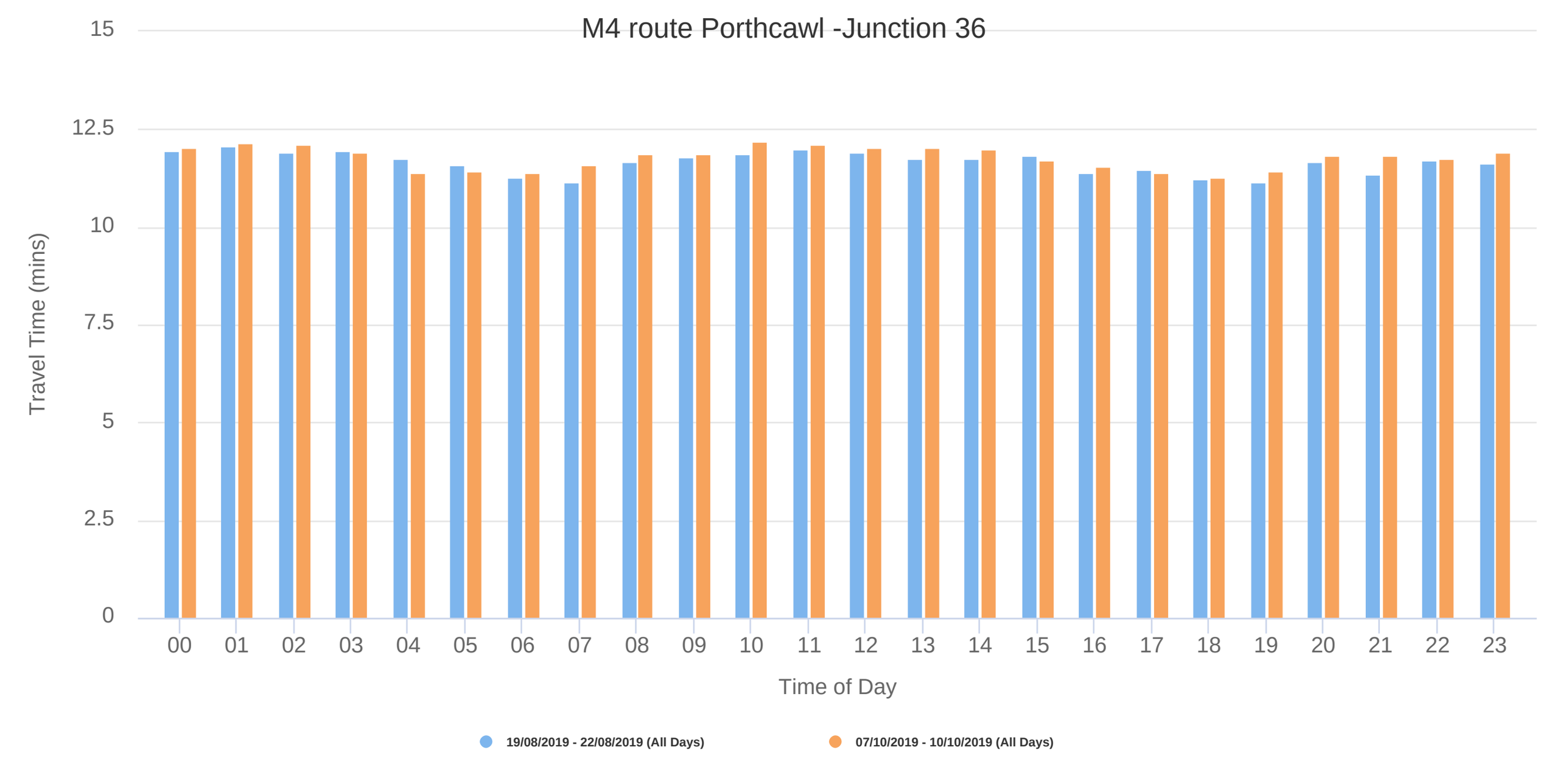
Time of Day
19/08/2019 - 22/08/2019 (All Days)
07/10/2019 - 10/10/2019 (All Days)


M4 route Porthcawl -Junction 36
Travel Time (mins)
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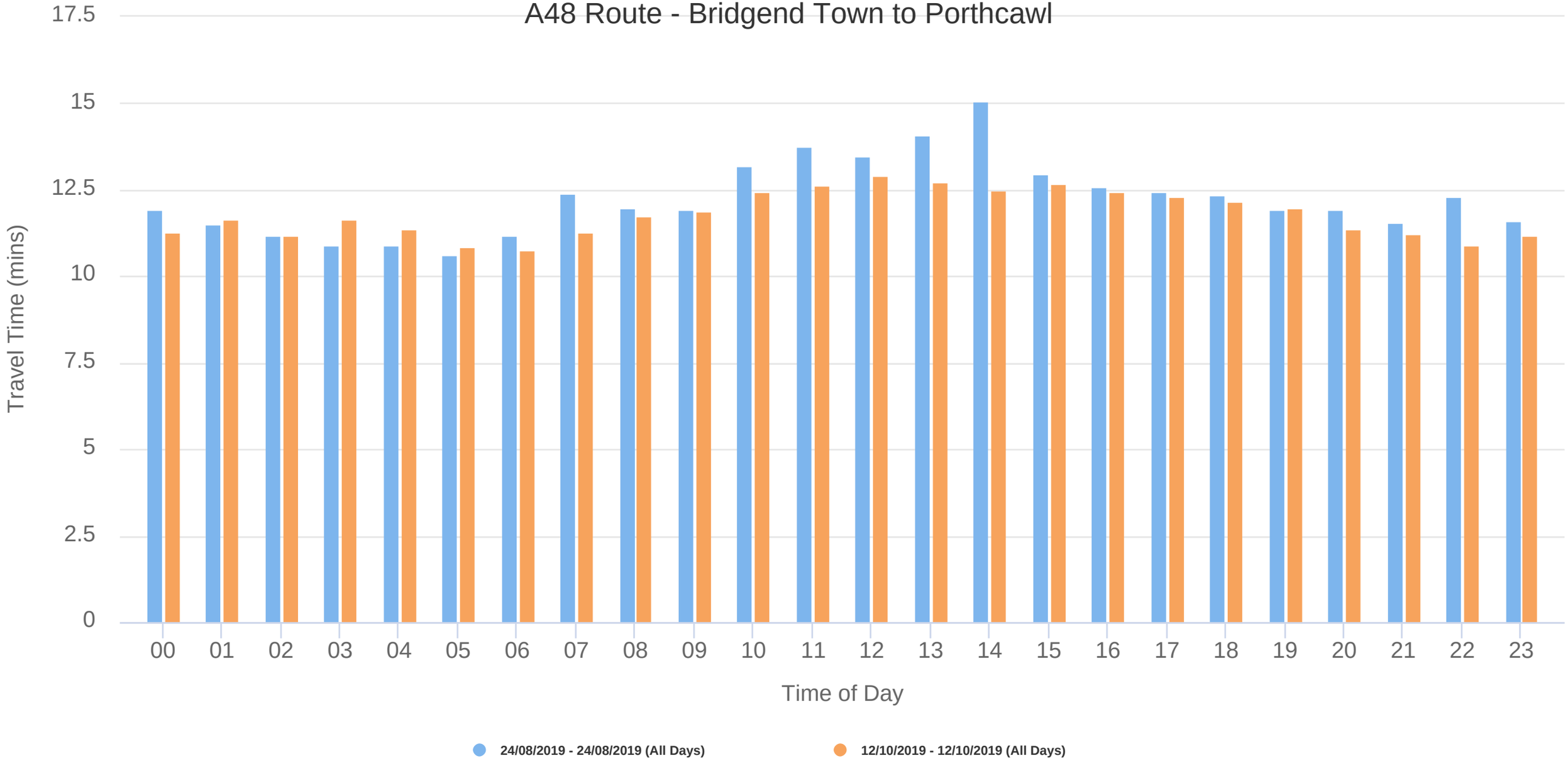
07/10/2019 - 10/10/2019 (All Days)


A48 Route - Bridgend Town to Porthcawl
Travel Time (mins)
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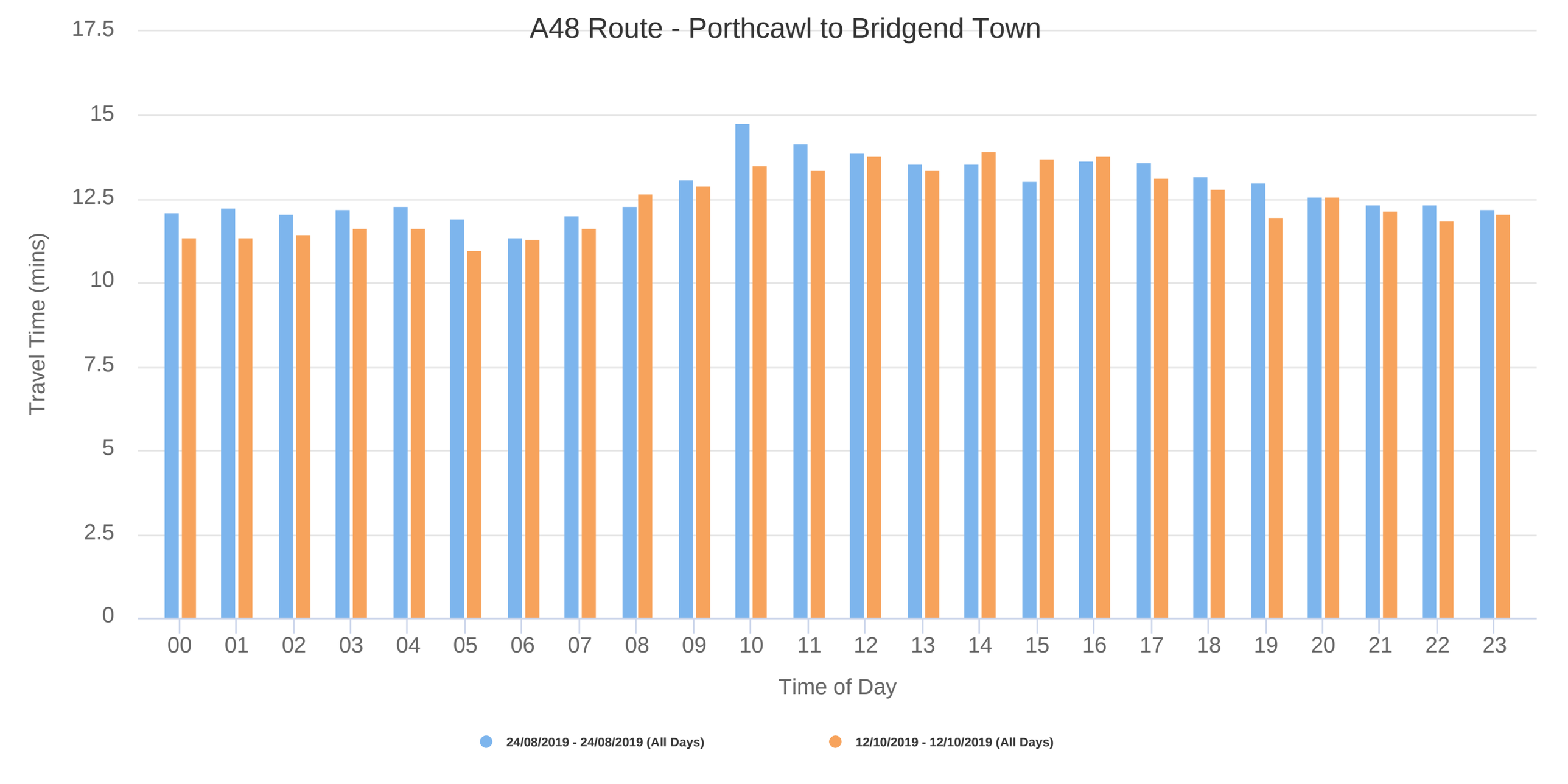
24/08/2019 - 24/08/2019 (All Days)
12/10/2019 - 12/10/2019 (All Days)


A48 Route - Porthcawl to Bridgend Town
Travel Time (mins)
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Time of Day
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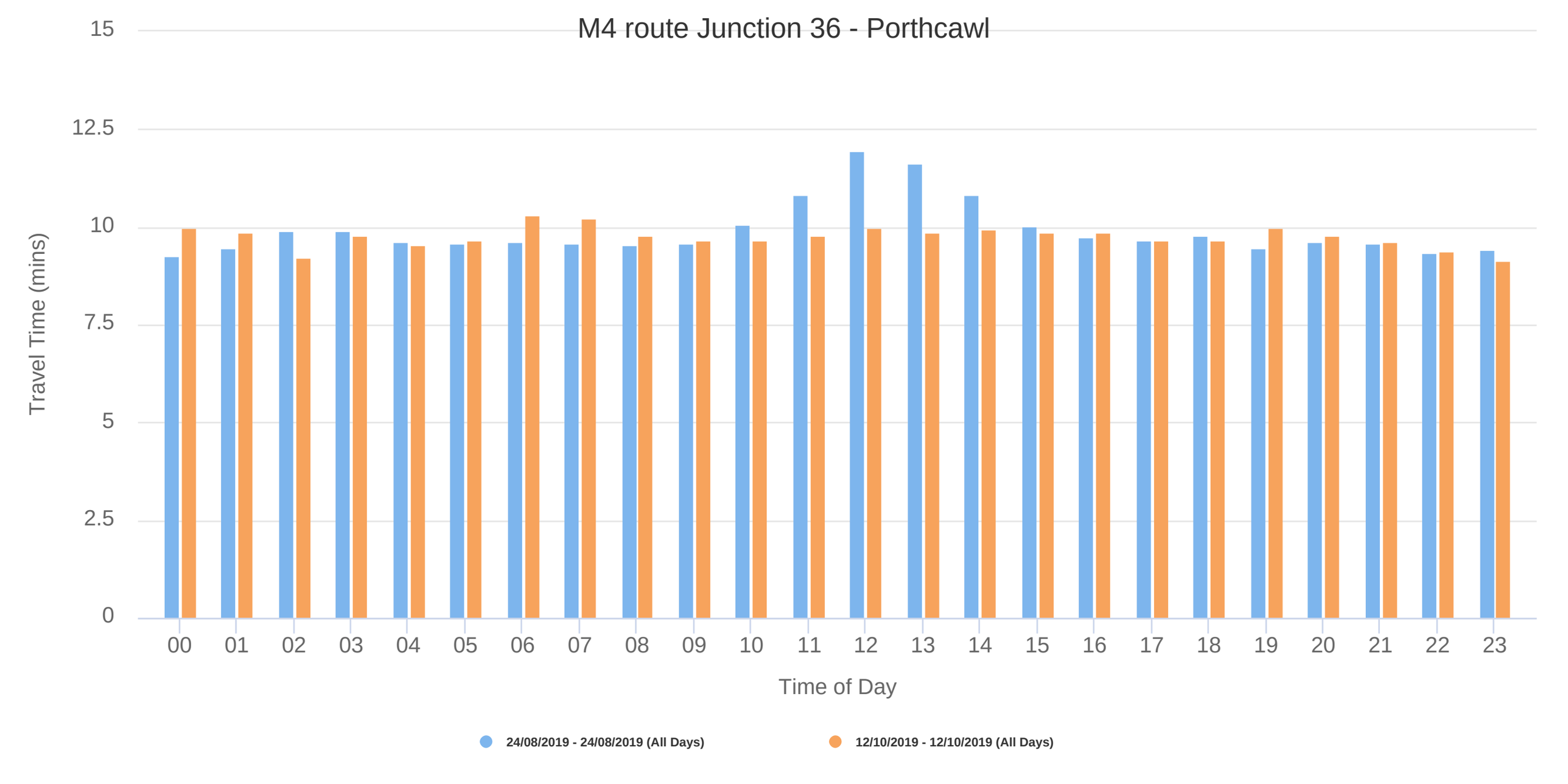
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Travel Time (mins)
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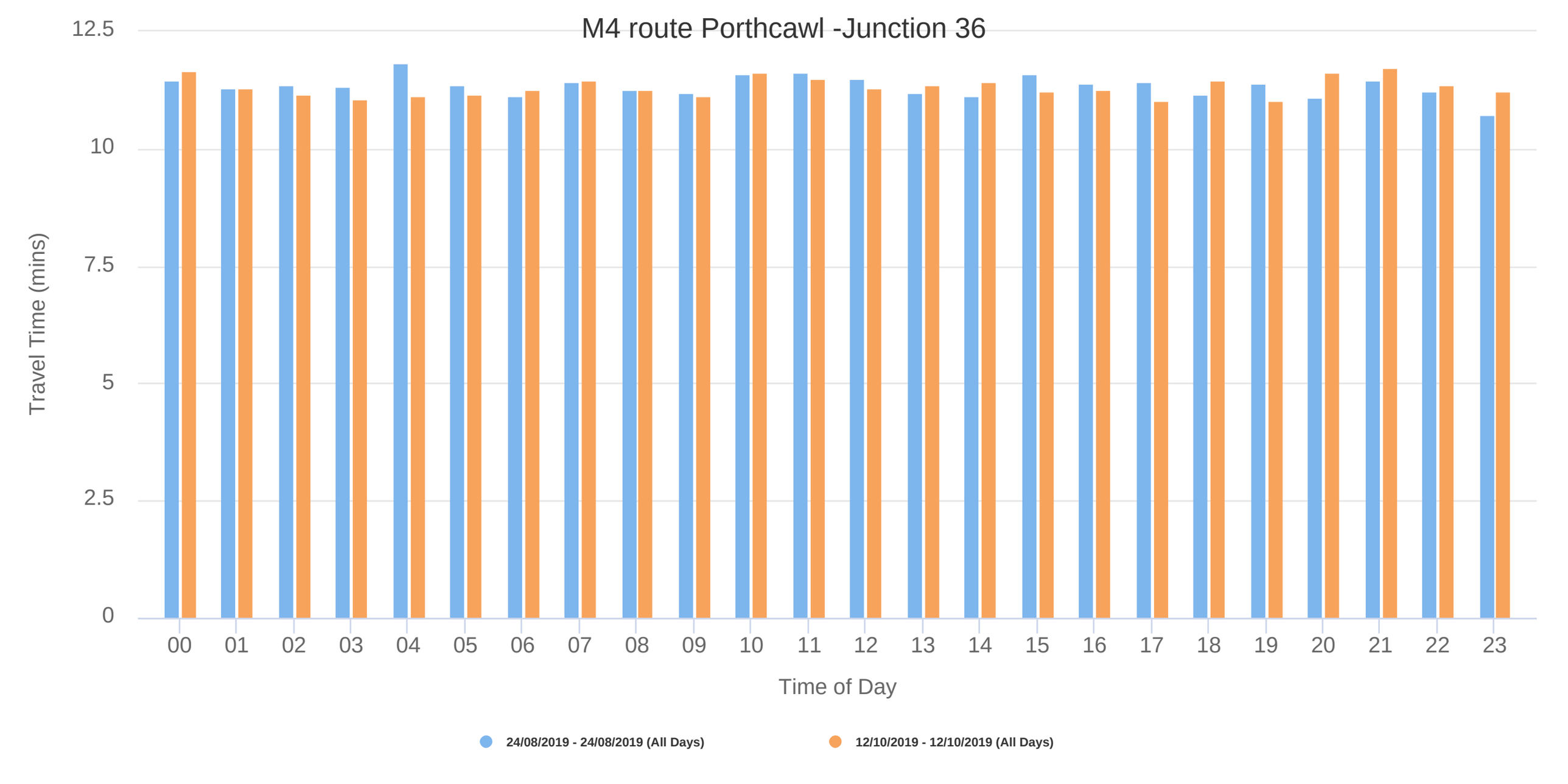
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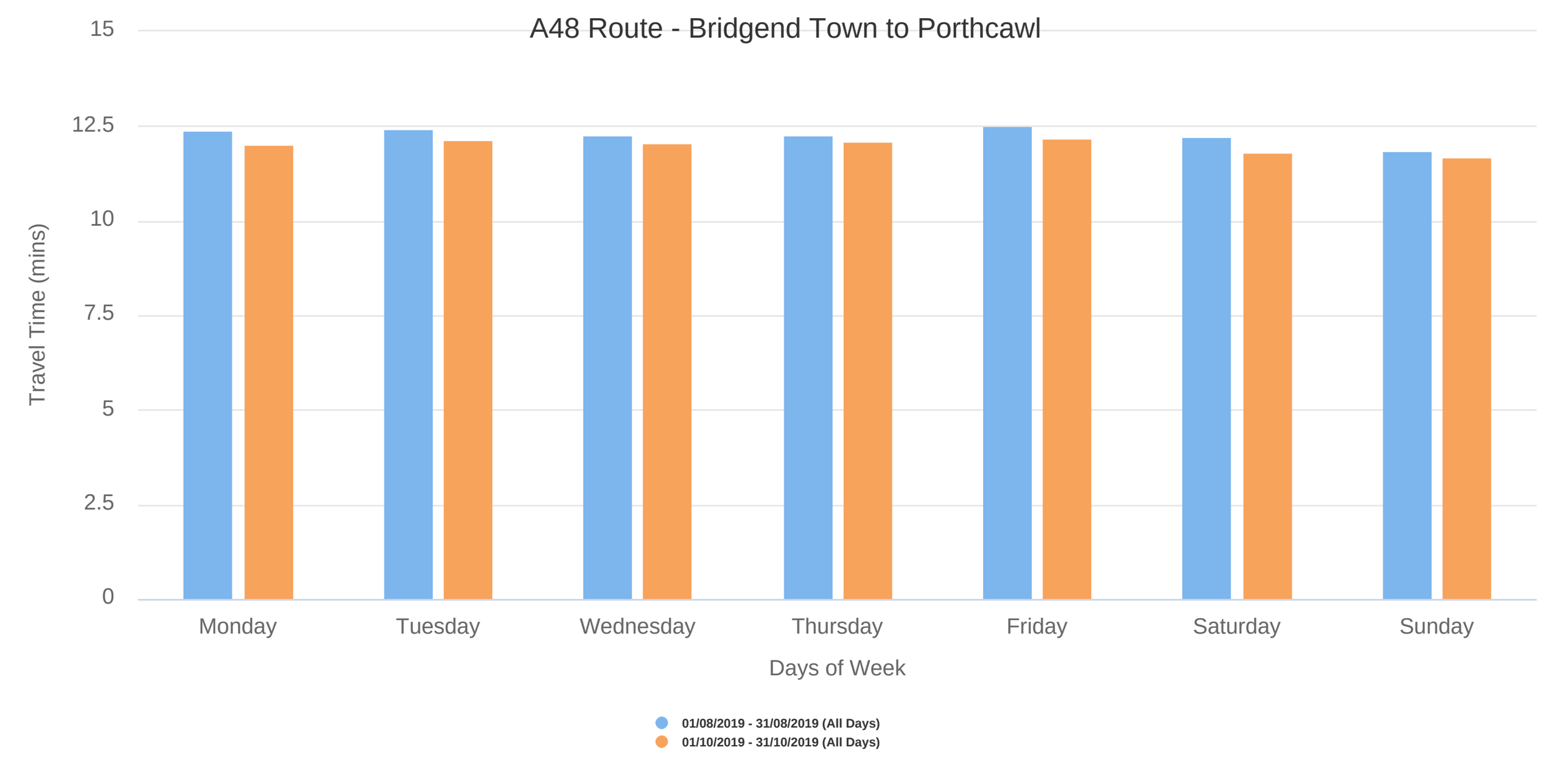
Time of Day
24/08/2019 - 24/08/2019 (All Days)
12/10/2019 - 12/10/2019 (All Days)


A48 Route - Bridgend Town to Porthcawl
Travel Time (mins)
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12.5
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2.5
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Monday
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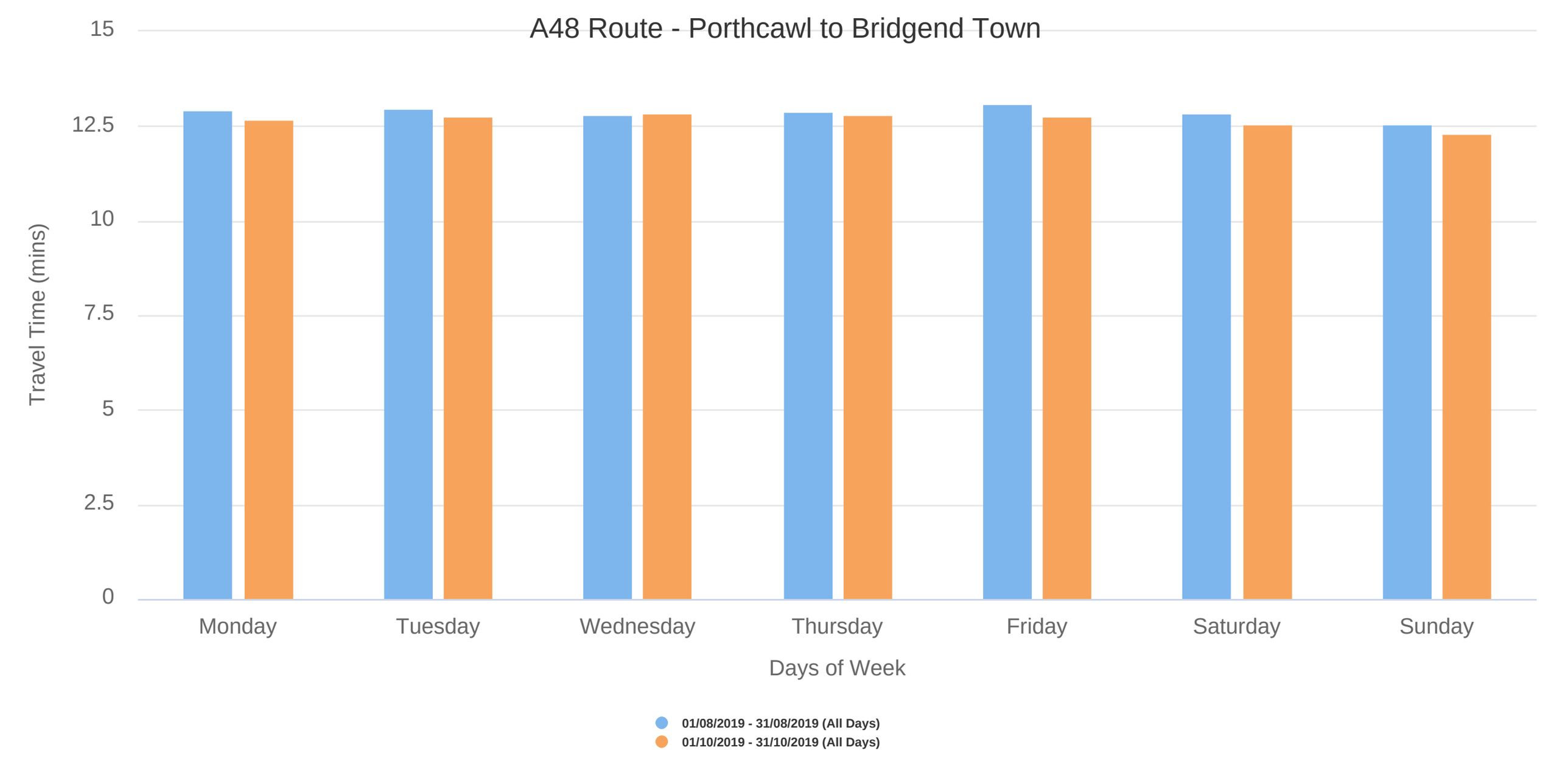
Days of Week
01/08/2019 - 31/08/2019 (All Days)
01/10/2019 - 31/10/2019 (All Days)


A48 Route - Porthcawl to Bridgend Town
Travel Time (mins)
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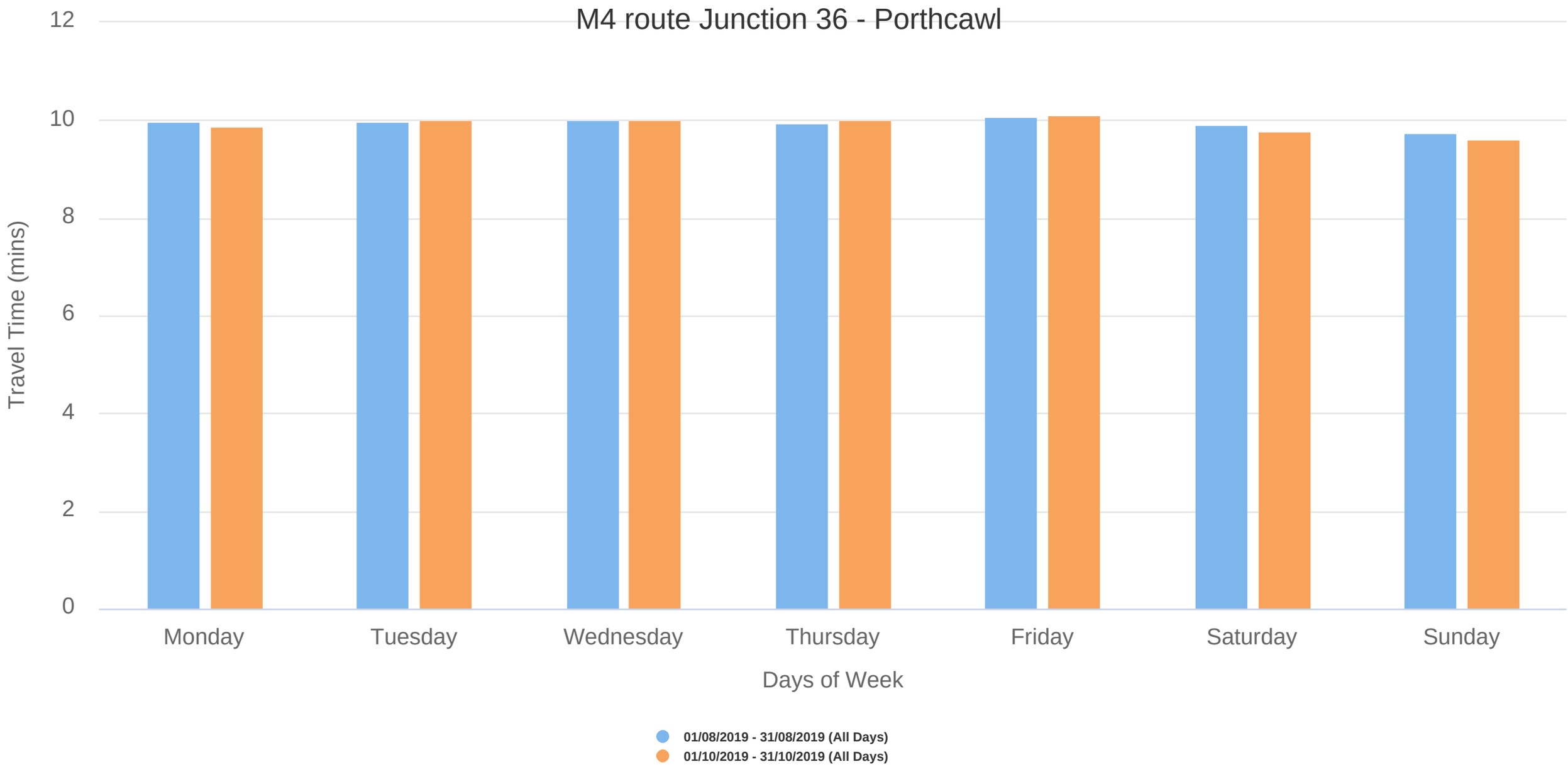
Days of Week
01/08/2019 - 31/08/2019 (All Days)
01/10/2019 - 31/10/2019 (All Days)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Travel Time (mins)
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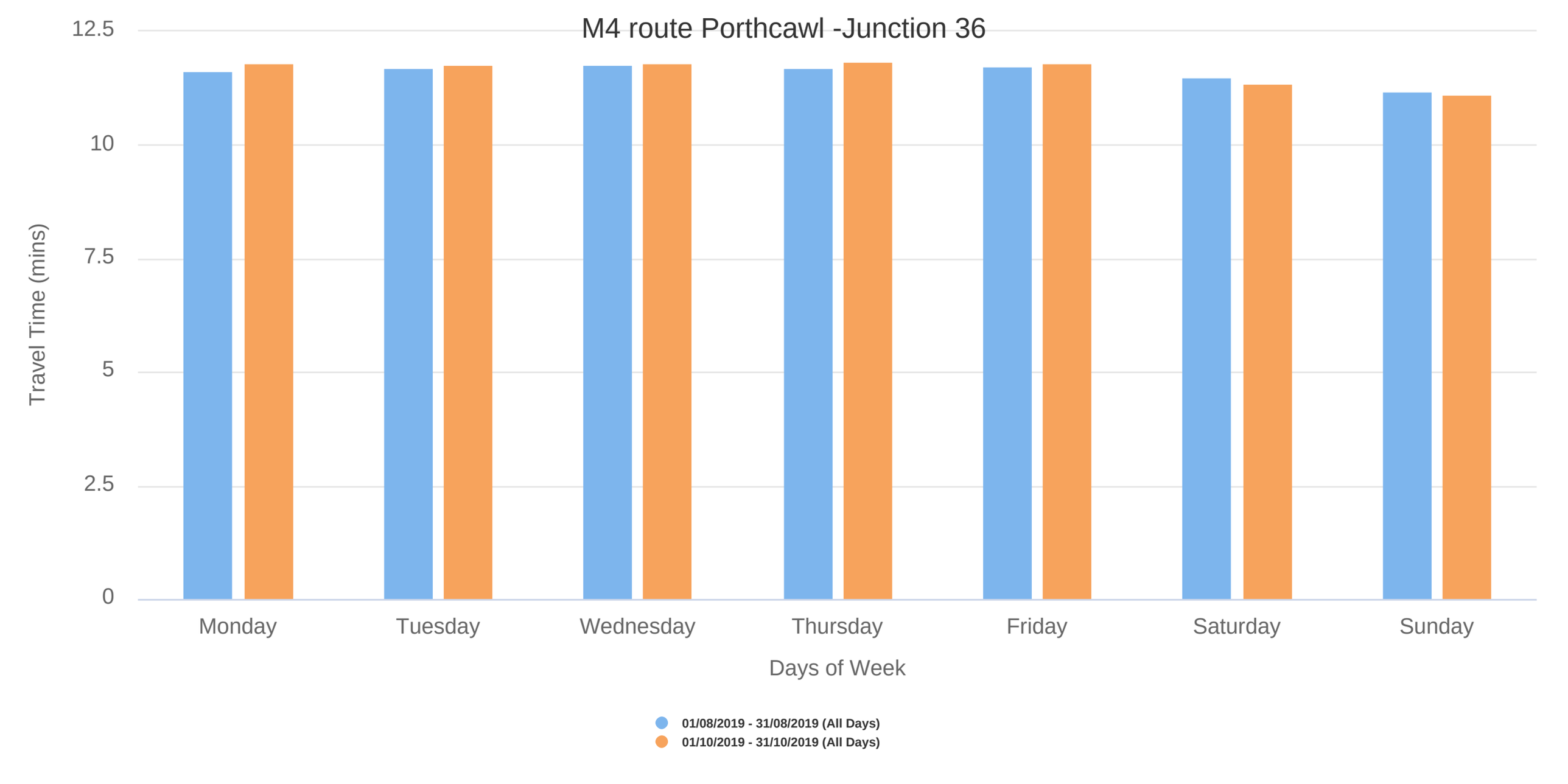
Days of Week
01/08/2019 - 31/08/2019 (All Days)
01/10/2019 - 31/10/2019 (All Days)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Travel Time (mins)
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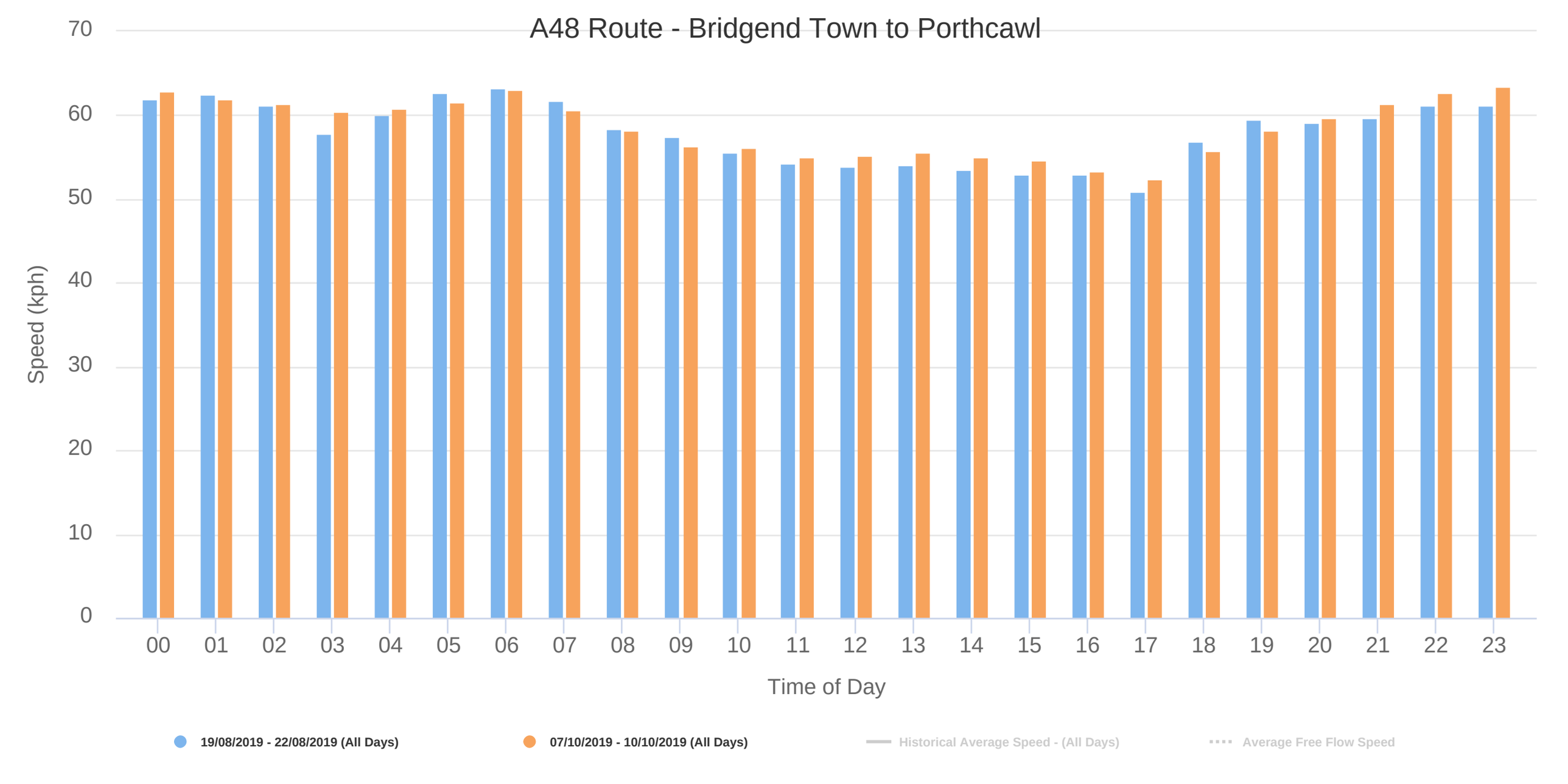
Days of Week
01/08/2019 - 31/08/2019 (All Days)
01/10/2019 - 31/10/2019 (All Days)


A48 Route - Bridgend Town to Porthcawl
Speed (kph)
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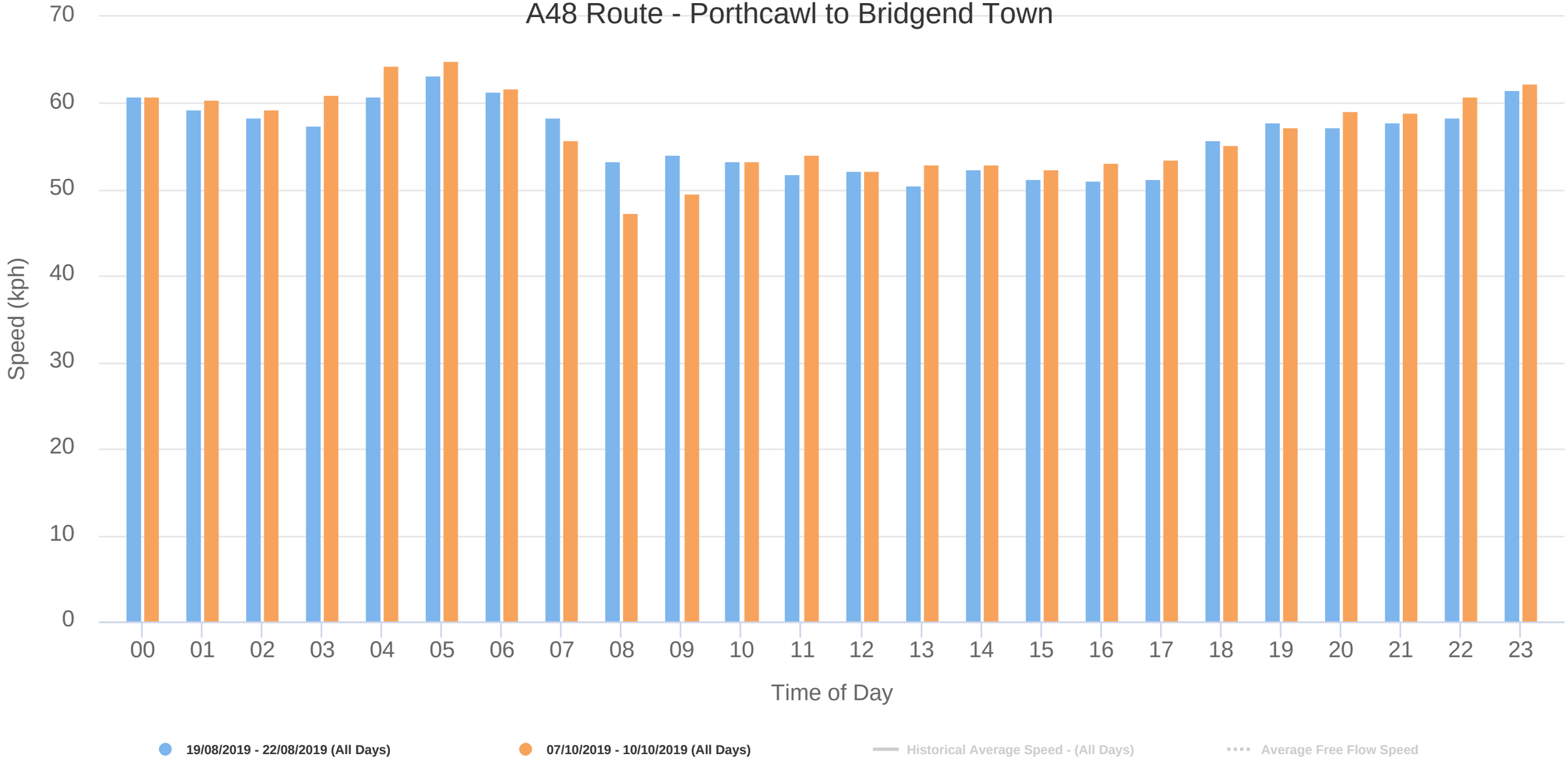
Time of Day
19/08/2019 - 22/08/2019 (All Days)
07/10/2019 - 10/10/2019 (All Days)
Historical Average Speed - (All Days)
Average Free Flow Speed


A48 Route - Porthcawl to Bridgend Town
Speed (kph)
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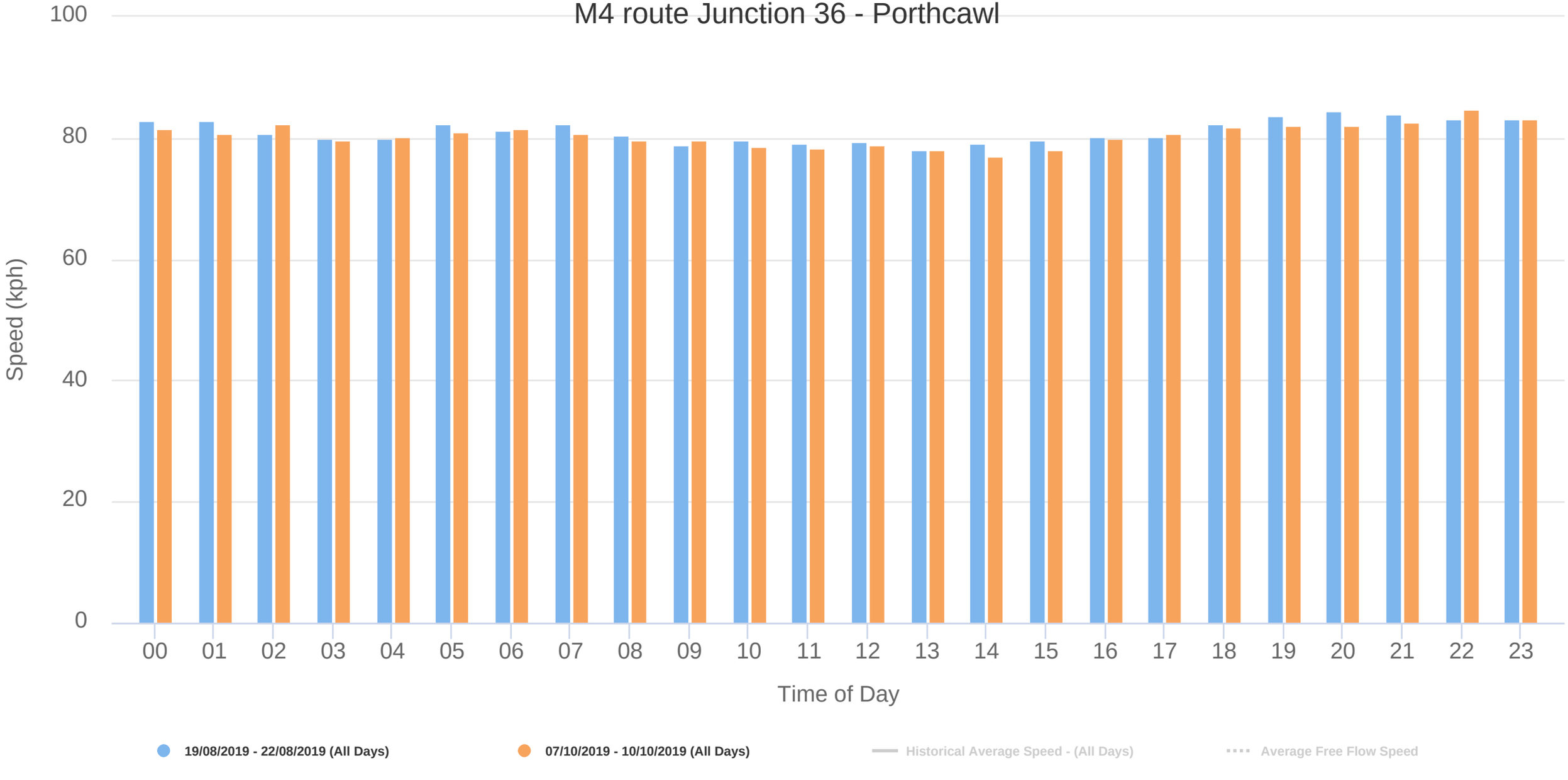
19/08/2019 - 22/08/2019 (All Days)
07/10/2019 - 10/10/2019 (All Days)
Historical Average Speed - (All Days)
Average Free Flow Speed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Speed (kph)
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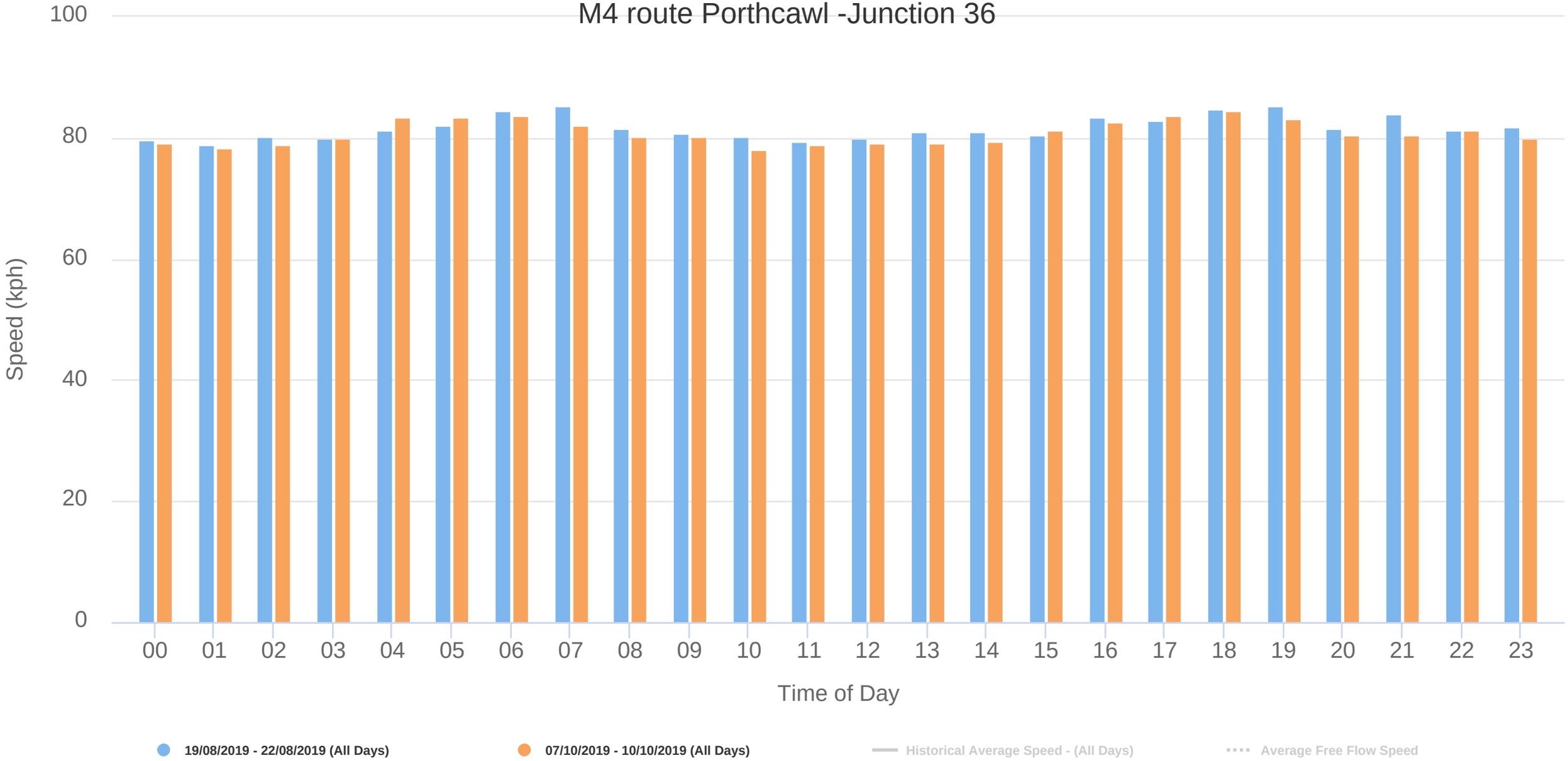
Time of Day
19/08/2019 - 22/08/2019 (All Days)
07/10/2019 - 10/10/2019 (All Days)
Historical Average Speed - (All Days)
Average Free Flow Speed


M4 route Porthcawl -Junction 36
Speed (kph)
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80
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07
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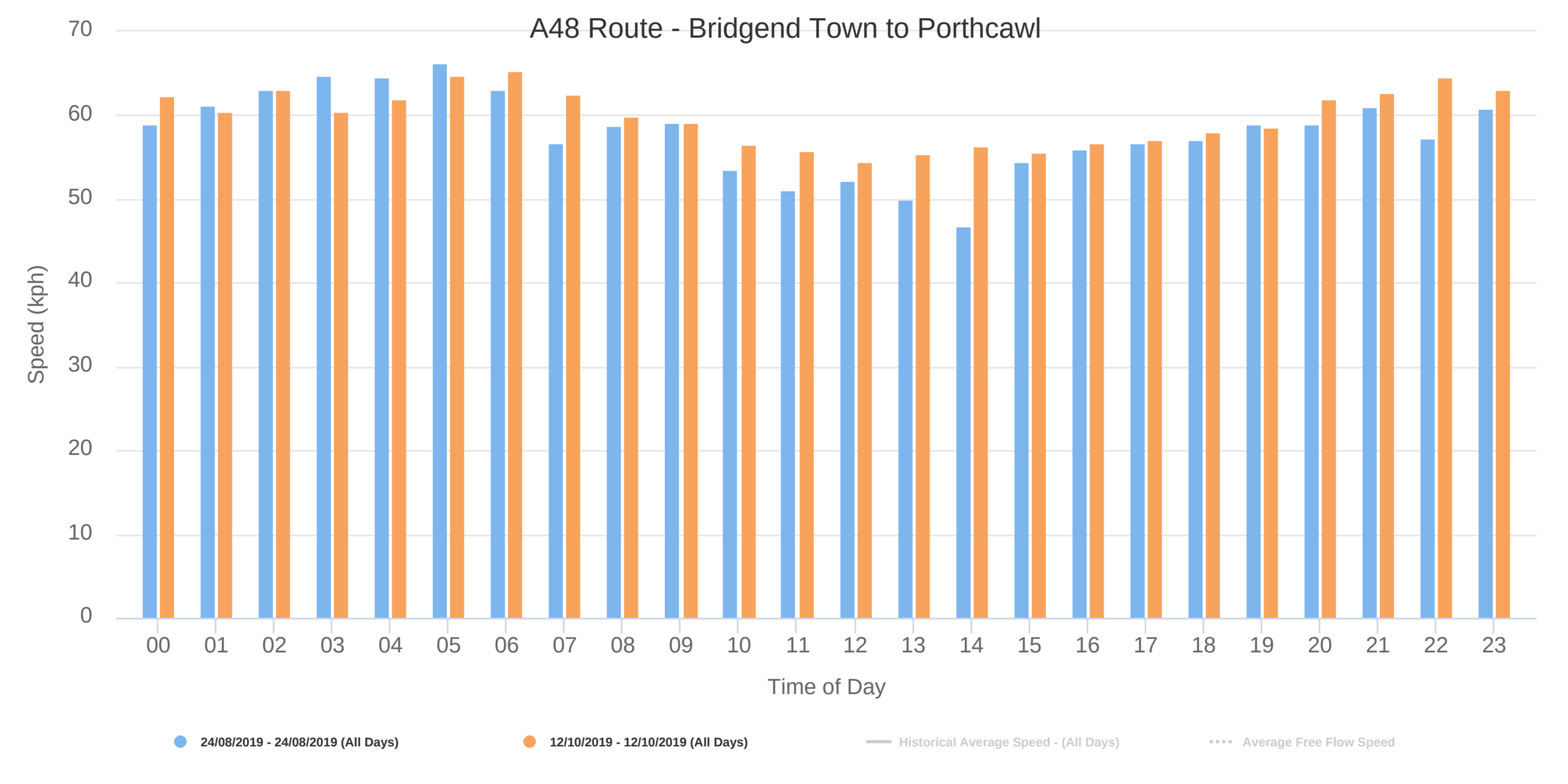
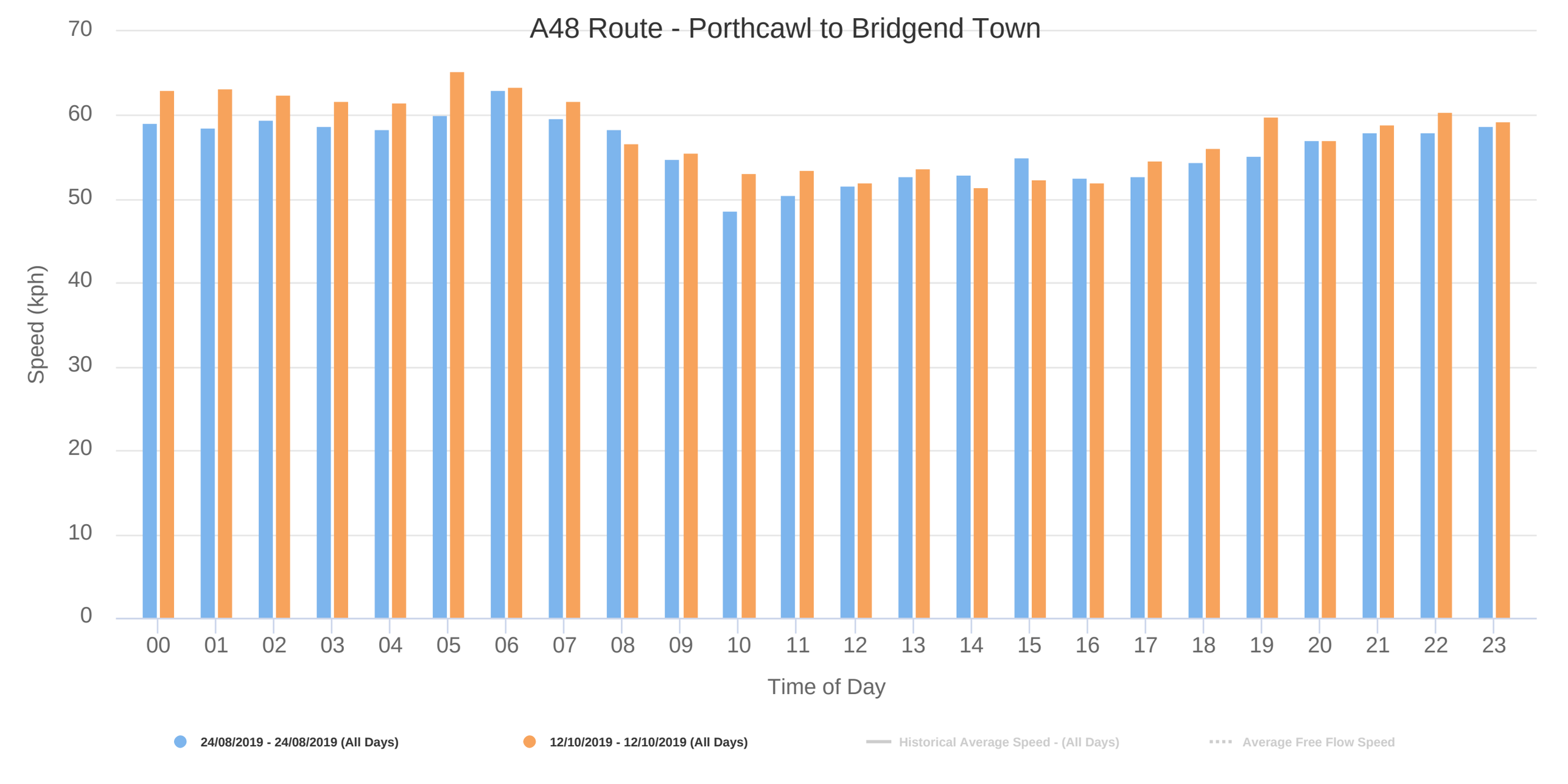
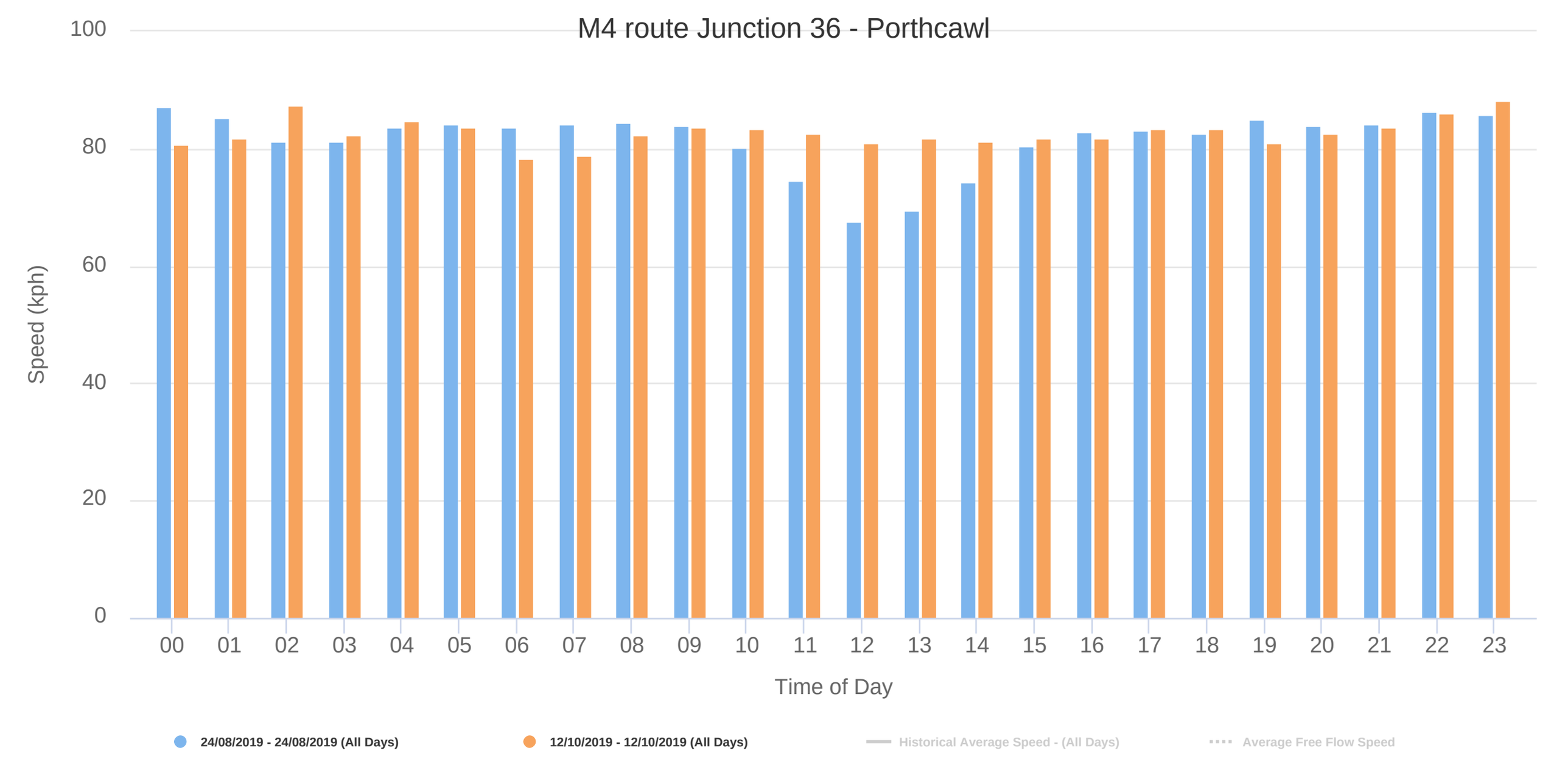
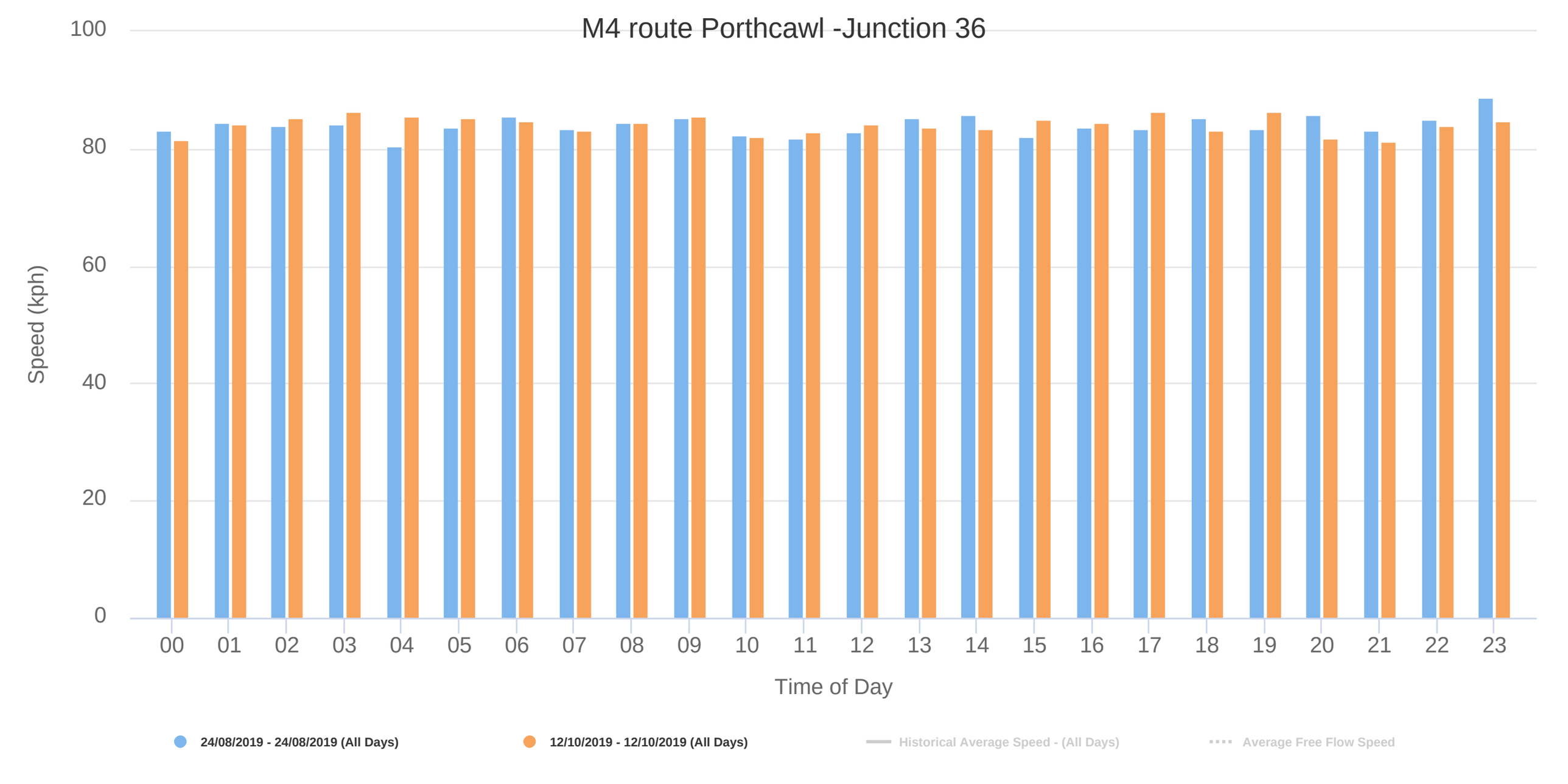
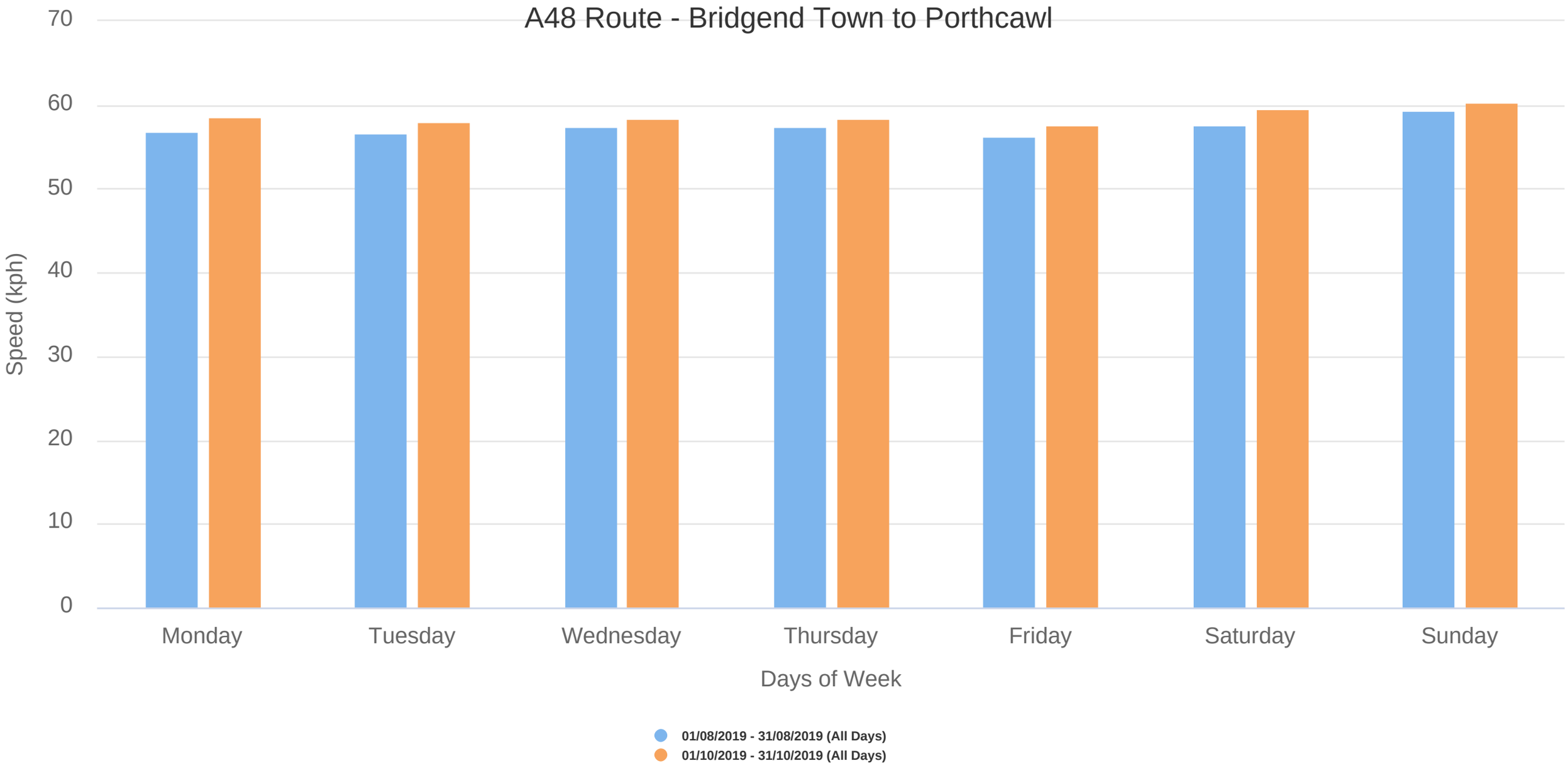
Time of Day
19/08/2019 - 22/08/2019 (All Days)
07/10/2019 - 10/10/2019 (All Days)
Historical Average Speed - (All Days)
Average Free Flow Speed

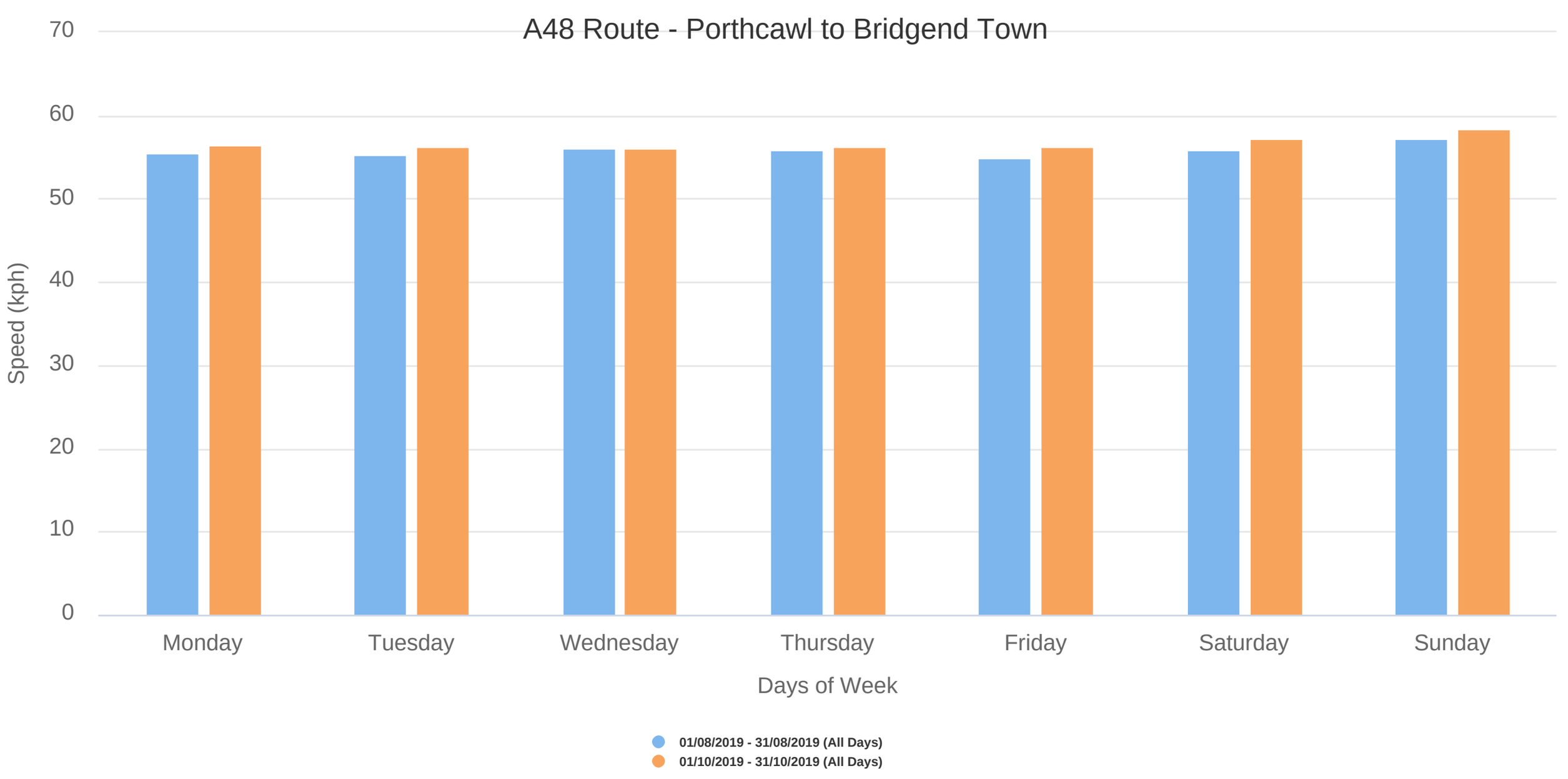

A48 Route - Bridgend Town to Porthcawl
Speed (kph)
70
60
50
40
30
20
10
0
00
01
02
03
04
05
06
07
08
09
10
11
12
13
14
15
16
17
18
19
20
21
22
23
Time of Day
24/08/2019 - 24/08/2019 (All Days)
12/10/2019 - 12/10/2019 (All Days)
Historical Average Speed - (All Days)
Average Free Flow Speed

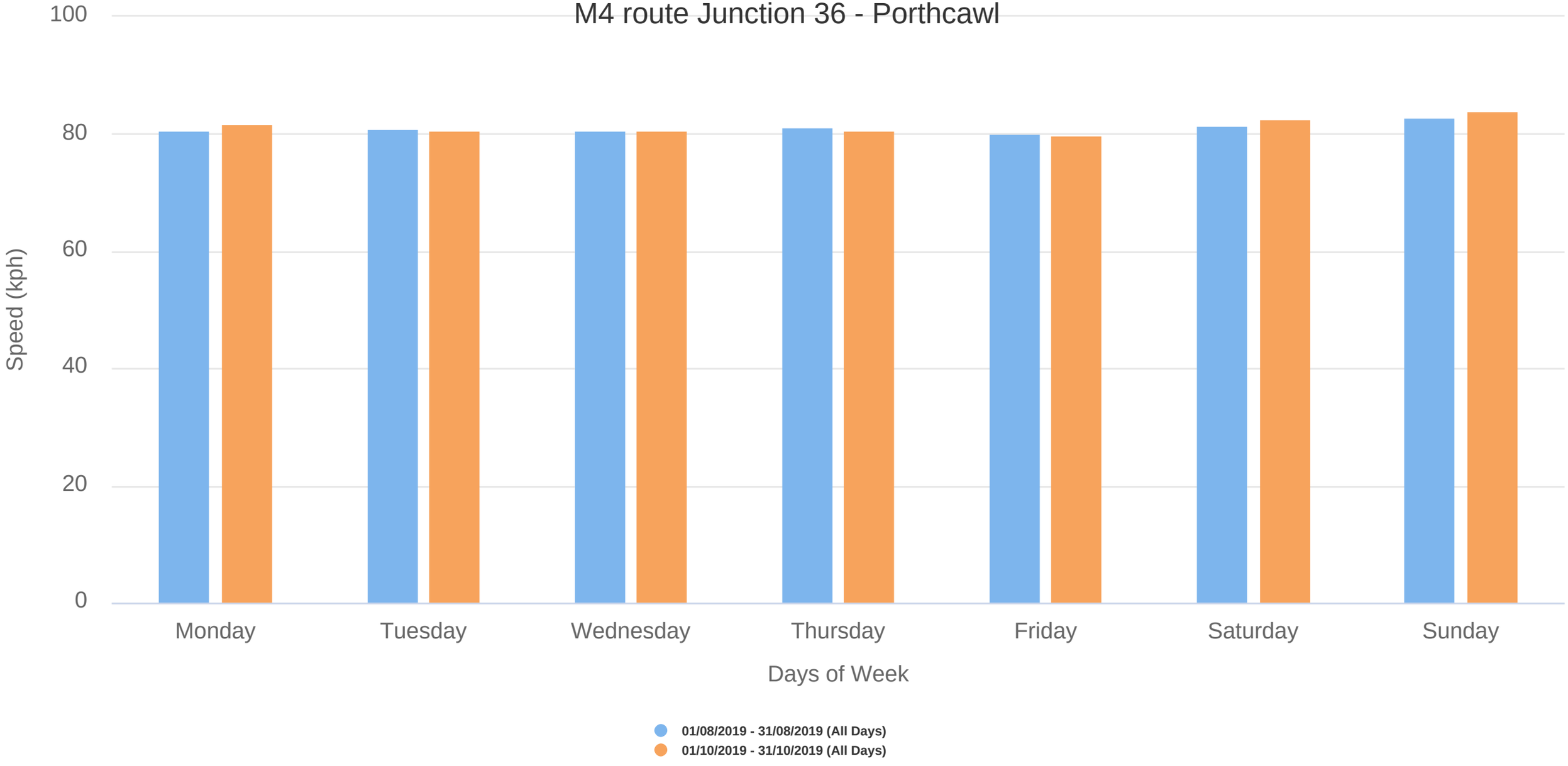

A48 Route - Porthcawl to Bridgend Town
Speed (kph)
70
60
50
40
30
20
10
0
00
01
02
03
04
05
06
07
08
09
10
11
12
13
14
15
16
17
18
19
20
21
22
23
Time of Day
24/08/2019 - 24/08/2019 (All Days)
12/10/2019 - 12/10/2019 (All Days)
Historical Average Speed - (All Days)
Average Free Flow Speed

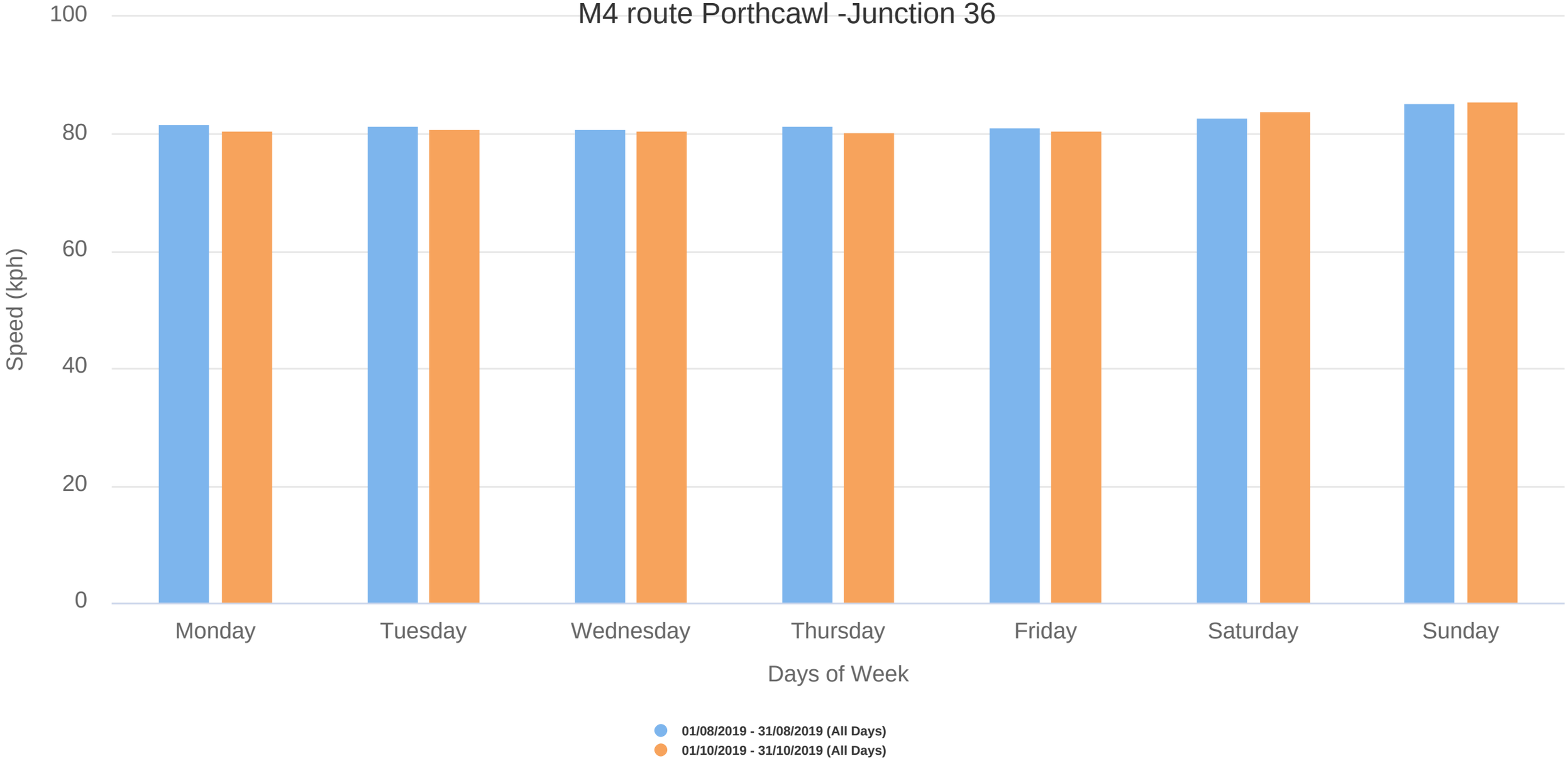

M4 route Junction 36 - Porthcawl
Speed (kph)
100
80
60
40
20
0
00
01
02
03
04
05
06
07
08
09
10
11
12
13
14
15
16
17
18
19
20
21
22
23
Time of Day
24/08/2019 - 24/08/2019 (All Days)
12/10/2019 - 12/10/2019 (All Days)
Historical Average Speed - (All Days)
Average Free Flow Speed


M4 route Porthcawl -Junction 36
100
80
60
40
20
0
Speed (kph)
00
01
02
03
04
05
06
07
08
09
10
11
12
13
14
15
16
17
18
19
20
21
22
23
Time of Day
24/08/2019 - 24/08/2019 (All Days)
12/10/2019 - 12/10/2019 (All Days)
Historical Average Speed - (All Days)
Average Free Flow Speed


A48 Route - Bridgend Town to Porthcawl
70
60
50
40
30
20
10
0
Speed (kph)
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Sunday
Days of Week
01/08/2019 - 31/08/2019 (All Days)
01/10/2019 - 31/10/2019 (All Days)


A48 Route - Porthcawl to Bridgend Town
70
60
50
40
30
20
10
0
Speed (kph)
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Sunday
Days of Week
01/08/2019 - 31/08/2019 (All Days)
01/10/2019 - 31/10/2019 (All Days)


M4 route Junction 36 - Porthcawl
100
80
60
40
20
0
Speed (kph)
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Sunday
Days of Week
01/08/2019 - 31/08/2019 (All Days)
01/10/2019 - 31/10/2019 (All Days)


M4 route Porthcawl -Junction 36
100
80
60
40
20
0
Speed (kph)
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Sunday
Days of Week
01/08/2019 - 31/08/2019 (All Days)
01/10/2019 - 31/10/2019 (All Days)

Bridgend Replacement Local Development Plan

Technical Note Series

Project:	Bridgend Replacement LDP		
Our reference:	100415574 – TN 006	**Your reference:**	
Prepared by:	Claudia Currie	**Date:**	May 2021
Approved by:	Claudia Currie	**Checked by:**	Margaret Henderson
Subject:	Development Impact on BCBC from Neighbouring Unitary Authorities.		

1 Introduction

Mott MacDonald was commissioned in January 2020 by Bridgend County Borough Council to develop a series of technical notes to help inform the supporting evidence for the Replacement Local Development Plan.

Each technical note details the work that has been completed, draws conclusions and makes recommendations for further analysis in order to inform the development of the Replacement Bridgend Local Development Plan.

This Technical Note 6 reports on the review undertaken of neighbouring local authority development proposals and assess the likely impact of these significant large scale developments on the strategic transport network within BCBC.

2 Location

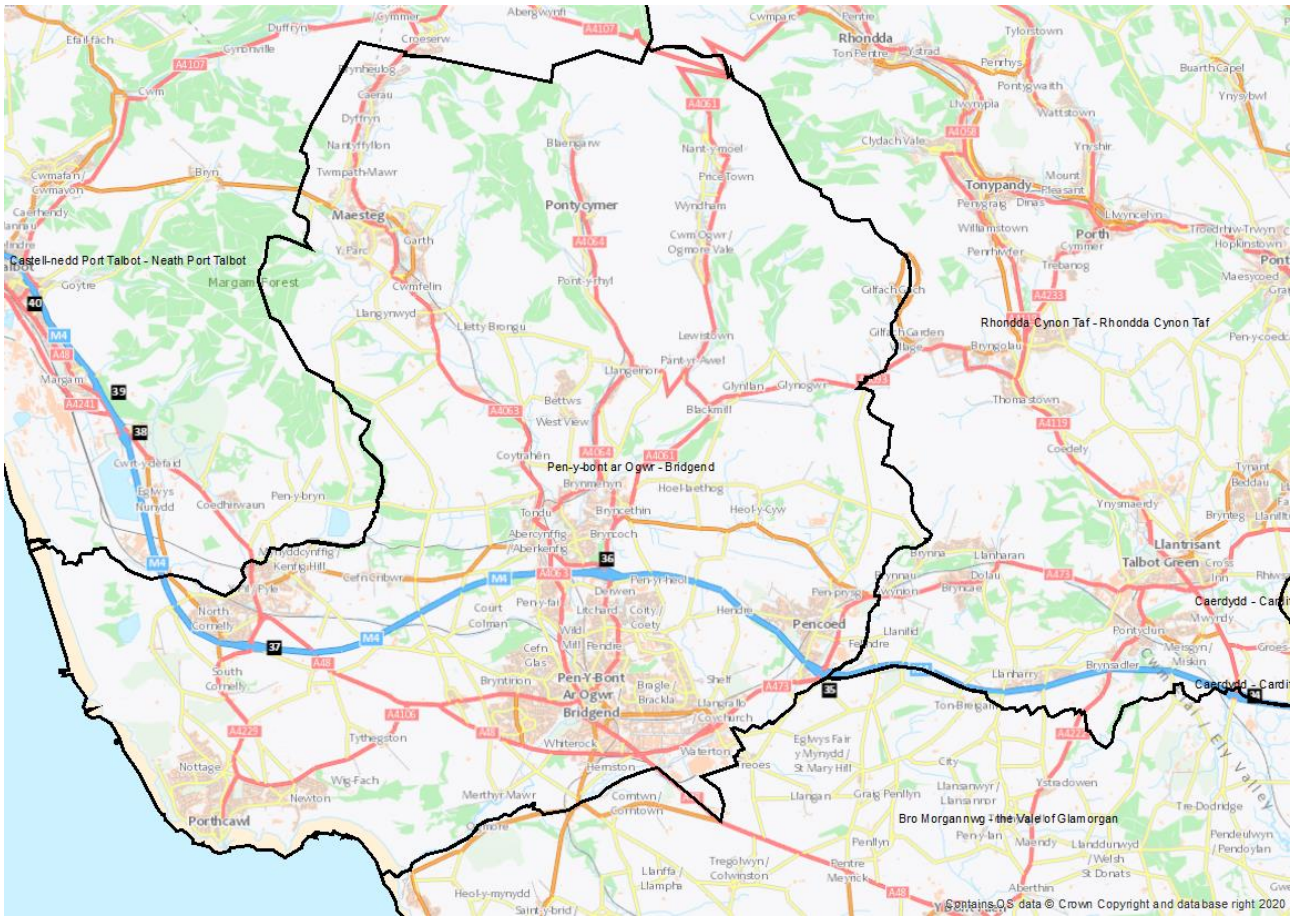
The Welsh Government (WG) is the highway authority that is responsible for the motorway and trunk roads in Wales. The M4 motorway is a three lane highway that runs east and westbound across the middle of the Bridgend County Borough Council unitary authority area.

The M4 motorway can currently be used to access areas within the Bridgend County Borough Council area at three locations as shown in Figure 1. These three accesses are at:-

- Pencoed (Junction 35) which is partially signal controlled roundabout,
- Sarn (Junction 36) which is a signal controlled dumbbell gyratory, and
- Pyle (Junction 37) which is a roundabout.

Bridgend County Borough Council (BCBC), is bounded by the Bristol Chanel to the south and three unitary authority areas; to the north and west is Neath Port Talbot, to the north and east is Rhondda Cynon Taff (RCT) and to the east is The Vale of Glamorgan, as shown in Figure 1.

FIGURE 1: Bridgend Area



Source: Mott MacDonald; ArcMap

3 Major Developments

No candidate site has currently identified a capacity concern at Junction 35 or Junction 37 and no candidate site has been required to assess Junction 36 due to the industry accepted 5% threshold impact not having been exceeded.

However, there is a significant development within the Rhondda Cynon Taff County Borough Council (RCTCBC) area, known as Llanilid, that has been considered for many years. As part of this development it was proposed in the late 1990's that a new M4 motorway junction (34a) would be constructed between Junction 34 and Junction 35. WG have previously given approval in principle to a junction design at this location. However, the current promotors of the RCTCBC site are not considering the construction of a new M4 junction as they are proposing to co-locate residential and employment areas such that the need to travel will be contained within the development area. In addition, the promoter's consultants are investigating options where active

travel modes will have enhanced facilities, financed through developer contributions. This will support modal shift away from vehicle movements to/from the development and away from the M4.

There are currently no detailed development proposals in the public domain for this RCT development at Llanilid. These are described in more detail in Technical Note 2 Section 6 ‘Major developments impacting the M4 junctions’.

4 South East Wales Traffic Model (SEWTM) Conclusion

In order to establish a measure of the likely traffic flow increases entering the BCBC area a series of select link analyses were carried out to establish what the difference in forecast flows are between the 2015 base year and the 2036 future year. The 2036 future year forecasting within the SEWTM is capped to the Experian data for each unitary authority, as the industry standard. However, within each unitary authority area, more targeted local growth rates were developed that were informed by development control estimates that are classified as “near certain”, “more than likely” and “reasonably foreseeable” (*DfT TAG Unit M4 - Table A2 Classification of Future Impacts*) as provided by a number of South East Wales unitary authorities including,

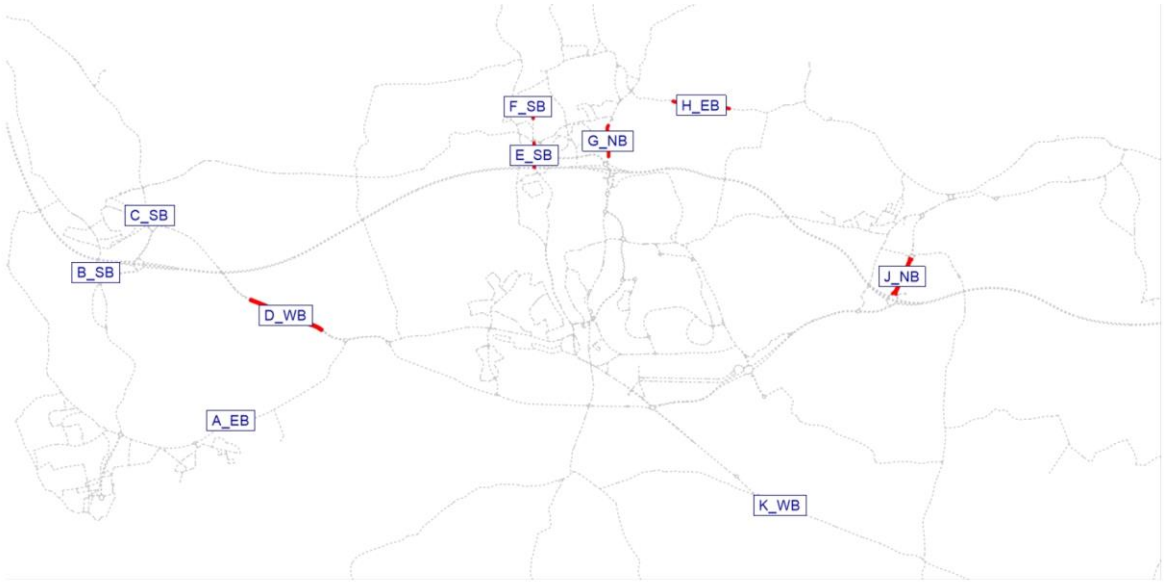
- Rhondda Cynon Taf
- Bridgend

Figure 2 shows the highway links in the SEWTM model for which the select link data has been extracted and Tables 1 to 5 show extracts from the SEWTM modelled growth for the following time periods (see Appendix A for the full traffic flow details).

- AM peak
- PM peak
- Inter peak
- Off Peak
- AADT

The tables highlight the highest growth rates are from the east of the Unitary Authority Area, which includes local traffic from Rhondda Cynon Taff, Cardiff and the Vale of Glamorgan. As the links selected excluded the M4 the majority of through traffic has not been included in these growth rates.

Figure 2. SEWTM Links



Source: Mott MacDonald Managed Regional Traffic Model SEWTM

Table 1 AM Peak hour SEWTM predicted growth

			% Growth 2015-2026 HGV	% Growth 2015-2026 LGV	% Growth 2015-2026 All Cars	% Growth 2015-2026 All Vehicles	% Growth 2015-2036 HGV	% Growth 2015-2036 LGV	% Growth 2015-2036 All Cars	% Growth 2015-2036 All Vehicles
AM	A_EB	A4061 Newton	0%	15%	16%	16%	0%	31%	19%	19%
AM	A_WB	A4061 Newton	-7%	17%	14%	13%	0%	28%	24%	24%
AM	B_NB	B40783 North of the M4	0%	15%	9%	9%	0%	30%	18%	19%
AM	B_SB	B40783 North of the M4	0%	16%	6%	8%	0%	31%	17%	19%
AM	C_NB	A48 Pyle	0%	16%	28%	23%	0%	28%	37%	33%
AM	C_SB	A48 Pyle	-14%	19%	17%	15%	-17%	34%	14%	16%
AM	D_EB	A48 Stormy Down	-13%	17%	10%	9%	-19%	25%	14%	14%
AM	D_WB	A48 Stormy Down	-2%	17%	30%	25%	0%	30%	43%	37%
AM	E_NB	A4062 North of the M4	-11%	16%	8%	8%	0%	29%	11%	13%
AM	E_SB	A4062 North of the M4	0%	18%	25%	23%	8%	39%	58%	53%
AM	F_NB	A4063 Aberkenfig	11%	20%	17%	17%	11%	34%	30%	30%
AM	F_SB	A4063 Aberkenfig	4%	22%	17%	17%	8%	58%	20%	22%
AM	G_NB	A4061 North of the M4	-8%	18%	28%	25%	-3%	34%	41%	37%
AM	G_SB	A4061 North of the M4	-5%	15%	5%	6%	0%	27%	5%	8%
AM	H_EB	B4028 East of Bryncethin	-25%	20%	45%	41%	0%	53%	70%	67%
AM	H_WB	B4028 East of Bryncethin	0%	17%	18%	18%	0%	100%	55%	57%
AM	J_NB	A473 North of the M4	0%	-5%	44%	36%	3%	8%	79%	66%
AM	J_SB	A473 North of the M4	0%	49%	45%	45%	60%	56%	84%	79%
AM	K_EB	A48 East of Bridgend	0%	18%	53%	42%	2%	38%	76%	63%
AM	K_WB	A48 East of Bridgend	0%	15%	34%	30%	3%	30%	55%	50%

Source: Mott MacDonald Managed Regional Traffic Model SEWTM

Table 2 IP Peak hour SEWTM predicted growth

			% Growth 2015-2026 HGV	% Growth 2015-2026 LGV	% Growth 2015-2026 All Cars	% Growth 2015-2026 All Vehicles	% Growth 2015-2036 HGV	% Growth 2015-2036 LGV	% Growth 2015-2036 All Cars	% Growth 2015-2036 All Vehicles
IP	A_EB	A4061 Newton	0%	17%	10%	11%	0%	20%	21%	21%
IP	A_WB	A4061 Newton	0%	13%	23%	21%	0%	28%	36%	34%
IP	B_NB	B40783 North of the M4	0%	15%	12%	13%	0%	30%	26%	27%
IP	B_SB	B40783 North of the M4	0%	18%	30%	27%	0%	35%	46%	43%
IP	C_NB	A48 Pyle	-62%	16%	22%	10%	-62%	31%	36%	22%
IP	C_SB	A48 Pyle	-3%	18%	8%	10%	-3%	-18%	21%	6%
IP	D_EB	A48 Stormy Down	-3%	16%	25%	21%	-3%	30%	40%	34%
IP	D_WB	A48 Stormy Down	0%	16%	37%	26%	0%	30%	51%	39%
IP	E_NB	A4062 North of the M4	0%	19%	17%	16%	14%	34%	23%	24%
IP	E_SB	A4062 North of the M4	0%	8%	13%	12%	0%	22%	26%	25%
IP	F_NB	A4063 Aberkenfig	0%	17%	23%	22%	11%	38%	39%	38%
IP	F_SB	A4063 Aberkenfig	0%	13%	21%	19%	0%	27%	36%	34%
IP	G_NB	A4061 North of the M4	-3%	13%	20%	18%	-6%	25%	39%	34%
IP	G_SB	A4061 North of the M4	6%	14%	16%	16%	6%	20%	30%	28%
IP	H_EB	B4028 East of Bryncethin	0%	12%	34%	32%	0%	71%	69%	69%
IP	H_WB	B4028 East of Bryncethin	0%	23%	14%	16%	0%	28%	36%	35%
IP	J_NB	A473 North of the M4	0%	20%	35%	31%	-19%	36%	88%	75%
IP	J_SB	A473 North of the M4	0%	28%	44%	40%	0%	68%	105%	95%
IP	K_EB	A48 East of Bridgend	0%	22%	62%	47%	0%	40%	97%	75%
IP	K_WB	A48 East of Bridgend	0%	45%	42%	40%	0%	64%	67%	62%

Source: Mott MacDonald Managed Regional Traffic Model SEWTM

Table 3 PM Peak hour SEWTM predicted growth

			% Growth 2015-2026 HGV	% Growth 2015-2026 LGV	% Growth 2015-2026 All Cars	% Growth 2015-2026 All Vehicles	% Growth 2015-2036 HGV	% Growth 2015-2036 LGV	% Growth 2015-2036 All Cars	% Growth 2015-2036 All Vehicles
PM	A_EB	A4061 Newton	0%	14%	9%	10%	0%	25%	19%	19%
PM	A_WB	A4061 Newton	0%	19%	8%	9%	0%	-7%	17%	16%
PM	B_NB	B40783 North of the M4	#DIV/0!	17%	9%	10%	#DIV/0!	31%	19%	21%
PM	B_SB	B40783 North of the M4	0%	17%	11%	12%	0%	34%	33%	33%
PM	C_NB	A48 Pyle	-65%	18%	15%	12%	-65%	33%	24%	21%
PM	C_SB	A48 Pyle	0%	26%	20%	21%	0%	43%	25%	29%
PM	D_EB	A48 Stormy Down	0%	37%	21%	22%	0%	56%	37%	38%
PM	D_WB	A48 Stormy Down	-6%	7%	15%	12%	-6%	21%	28%	25%
PM	E_NB	A4062 North of the M4	0%	15%	18%	18%	0%	13%	31%	27%
PM	E_SB	A4062 North of the M4	0%	18%	7%	8%	0%	32%	14%	15%
PM	F_NB	A4063 Aberkenfig	-10%	10%	10%	9%	0%	-37%	25%	16%
PM	F_SB	A4063 Aberkenfig	0%	19%	25%	24%	0%	33%	40%	39%
PM	G_NB	A4061 North of the M4	0%	17%	6%	7%	-7%	23%	6%	9%
PM	G_SB	A4061 North of the M4	0%	5%	33%	30%	0%	49%	42%	42%
PM	H_EB	B4028 East of Bryncethin	0%	60%	21%	24%	0%	90%	56%	58%
PM	H_WB	B4028 East of Bryncethin	0%	23%	10%	11%	200%	26%	31%	31%
PM	J_NB	A473 North of the M4	0%	52%	39%	40%	0%	68%	97%	92%
PM	J_SB	A473 North of the M4	0%	22%	42%	40%	13%	72%	105%	101%
PM	K_EB	A48 East of Bridgend	-7%	8%	15%	14%	7%	23%	36%	34%
PM	K_WB	A48 East of Bridgend	0%	19%	51%	45%	0%	41%	72%	65%

Source: Mott MacDonald Managed Regional Traffic Model SEWTM

Table 4 Off Peak hour SEWTM predicted growth

			% Growth 2015-2026 HGV	% Growth 2015-2026 LGV	% Growth 2015-2026 All Cars	% Growth 2015-2026 All Vehicles	% Growth 2015-2036 HGV	% Growth 2015-2036 LGV	% Growth 2015-2036 All Cars	% Growth 2015-2036 All Vehicles
OP	A_WB	A4061 Newton	0%	13%	31%	28%	0%	31%	44%	41%
OP	B_NB	B40783 North of the M4	0%	15%	12%	13%	0%	35%	29%	31%
OP	B_SB	B40783 North of the M4	0%	19%	29%	25%	0%	33%	47%	42%
OP	C_NB	A48 Pyle	0%	21%	25%	21%	-64%	32%	39%	23%
OP	C_SB	A48 Pyle	0%	17%	19%	17%	0%	31%	36%	31%
OP	D_EB	A48 Stormy Down	0%	20%	32%	26%	0%	32%	50%	41%
OP	D_WB	A48 Stormy Down	0%	17%	40%	27%	0%	30%	60%	43%
OP	E_NB	A4062 North of the M4	0%	15%	15%	15%	0%	31%	26%	26%
OP	E_SB	A4062 North of the M4	0%	17%	10%	11%	0%	33%	32%	32%
OP	F_NB	A4063 Aberkenfig	0%	16%	33%	28%	0%	37%	59%	52%
OP	F_SB	A4063 Aberkenfig	0%	13%	24%	21%	0%	33%	46%	42%
OP	G_NB	A4061 North of the M4	0%	16%	24%	21%	11%	29%	36%	33%
OP	G_SB	A4061 North of the M4	0%	15%	22%	20%	40%	32%	42%	40%
OP	H_EB	B4028 East of Bryncethin	-100%	14%	10%	8%	-100%	14%	33%	28%
OP	H_WB	B4028 East of Bryncethin	0%	17%	8%	10%	0%	33%	26%	28%
OP	J_NB	A473 North of the M4	0%	36%	38%	36%	-25%	52%	104%	87%
OP	J_SB	A473 North of the M4	0%	21%	59%	47%	0%	42%	145%	113%
OP	K_EB	A48 East of Bridgend	0%	18%	73%	51%	0%	41%	113%	82%
OP	K_WB	A48 East of Bridgend	0%	41%	45%	42%	0%	59%	77%	69%

Source: Mott MacDonald Managed Regional Traffic Model SEWTM

Table 5 AADT SEWTM predicted growth

			% Growth 2015-2026 HGV	% Growth 2015-2026 LGV	% Growth 2015-2026 All Cars	% Growth 2015-2026 All Vehicles	% Growth 2015-2036 HGV	% Growth 2015-2036 LGV	% Growth 2015-2036 All Cars	% Growth 2015-2036 All Vehicles
24Hr	A_EB	A4061 Newton	0%	17%	12%	12%	0%	25%	19%	19%
24Hr	A_WB	A4061 Newton	-1%	14%	19%	18%	0%	23%	31%	29%
24Hr	B_NB	B40783 North of the M4	0%	15%	11%	12%	0%	32%	24%	25%
24Hr	B_SB	B40783 North of the M4	0%	18%	20%	19%	0%	33%	36%	35%
24Hr	C_NB	A48 Pyle	-37%	17%	22%	16%	-57%	30%	34%	25%
24Hr	C_SB	A48 Pyle	-4%	19%	15%	15%	-5%	13%	24%	18%
24Hr	D_EB	A48 Stormy Down	-4%	19%	21%	19%	-5%	32%	34%	31%
24Hr	D_WB	A48 Stormy Down	-1%	14%	30%	23%	-1%	28%	44%	36%
24Hr	E_NB	A4062 North of the M4	-2%	16%	15%	15%	6%	24%	23%	23%
24Hr	E_SB	A4062 North of the M4	0%	14%	14%	13%	2%	31%	31%	31%
24Hr	F_NB	A4063 Aberkenfig	1%	15%	20%	19%	7%	15%	38%	34%
24Hr	F_SB	A4063 Aberkenfig	1%	15%	21%	20%	2%	35%	34%	33%
24Hr	G_NB	A4061 North of the M4	-3%	15%	18%	17%	-1%	27%	30%	28%
24Hr	G_SB	A4061 North of the M4	2%	13%	17%	16%	13%	29%	28%	28%
24Hr	H_EB	B4028 East of Bryncethin	-42%	22%	30%	28%	-36%	53%	60%	58%
24Hr	H_WB	B4028 East of Bryncethin	0%	20%	12%	13%	15%	34%	36%	35%
24Hr	J_NB	A473 North of the M4	0%	25%	39%	35%	-12%	40%	91%	80%
24Hr	J_SB	A473 North of the M4	0%	31%	46%	42%	12%	58%	105%	95%
24Hr	K_EB	A48 East of Bridgend	-1%	18%	45%	36%	1%	37%	73%	61%
24Hr	K_WB	A48 East of Bridgend	0%	33%	43%	39%	1%	52%	67%	62%

Source: Mott MacDonald Managed Regional Traffic Model SEWTM

5 Conclusion

Technical Note 6 has summarised the traffic growth modelled as part of the regional traffic model SEWTM developed by WG to inform development proposals in south east Wales and has summarised the expected situation with the Llanilid mixed-use development that is being proposed North of the M4 within the Rhondda Cynon Taff County Borough Area.

6 Recommendation

Due to the high of volume of predicted traffic growth anticipated from the eastern boundary of the Bridgend unitary authority area it is recommended that that a statement of common ground is entered into between RCTCBC and BCBC to ensure a jointly agreed position can be reached on the likely traffic generation from the Llanilid development site and the likely timescales for it to be fully delivery on the ground.

An example of a Statement of Common Ground is included in Technical Note 2.

A. Appendix A – SEWTM Output

			Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	% Growth	% Growth	% Growth	% Growth	% Growth	% Growth	% Growth	% Growth
			2015	2015	2015	2015	2026	2026	2026	2026	2036	2036	2036	2036	2015-2026	2015-2026	2015-2026	2015-2026	2015-2036	2015-2036	2015-2036	2015-2036
			HGV	LGV	All Cars	All Vehicles	HGV	LGV	All Cars	All Vehicles	HGV	LGV	All Cars	All Vehicles	HGV	LGV	All Cars	All Vehicles	HGV	LGV	All Cars	All Vehicles
AM	A_EB	A4061 Newton	12	26	597	635	12	30	694	736	12	34	711	757	0%	15%	16%	16%	0%	31%	19%	19%
AM	A_WB	A4061 Newton	14	18	541	573	13	21	615	649	14	23	672	709	-7%	17%	14%	13%	0%	28%	24%	24%
AM	B_NB	B40783 North of the M4	3	27	173	203	3	31	188	222	3	35	204	242	0%	15%	9%	9%	0%	30%	18%	19%
AM	B_SB	B40783 North of the M4	2	68	359	429	2	79	381	462	2	89	419	510	0%	16%	6%	8%	0%	31%	17%	19%
AM	C_NB	A48 Pyle	20	147	358	525	20	170	458	648	20	188	492	700	0%	16%	28%	23%	0%	28%	37%	33%
AM	C_SB	A48 Pyle	36	106	321	463	31	126	375	532	30	142	365	537	-14%	19%	17%	15%	-17%	34%	14%	16%
AM	D_EB	A48 Stormy Down	31	96	526	653	27	112	576	715	25	120	598	743	-13%	17%	10%	9%	-19%	25%	14%	14%
AM	D_WB	A48 Stormy Down	41	66	336	443	40	77	436	553	41	86	479	606	-2%	17%	30%	25%	0%	30%	43%	37%
AM	E_NB	A4062 North of the M4	9	38	505	552	8	44	544	596	9	49	563	621	-11%	16%	8%	8%	0%	29%	11%	13%
AM	E_SB	A4062 North of the M4	12	101	477	590	12	119	594	725	13	140	752	905	0%	18%	25%	23%	8%	39%	58%	53%
AM	F_NB	A4063 Aberkenfig	19	41	399	459	21	49	468	538	21	55	519	595	11%	20%	17%	17%	11%	34%	30%	30%
AM	F_SB	A4063 Aberkenfig	25	50	701	776	26	61	818	905	27	79	843	949	4%	22%	17%	17%	8%	58%	20%	22%
AM	G_NB	A4061 North of the M4	37	82	550	669	34	97	703	834	36	110	773	919	-8%	18%	28%	25%	-3%	34%	41%	37%
AM	G_SB	A4061 North of the M4	20	177	955	1152	19	203	999	1221	20	224	1005	1249	-5%	15%	5%	6%	0%	27%	5%	8%
AM	H_EB	B4028 East of Bryncethin	4	40	342	386	3	48	495	546	4	61	581	646	-25%	20%	45%	41%	0%	53%	70%	67%
AM	H_WB	B4028 East of Bryncethin	2	18	296	316	2	21	350	373	2	36	458	496	0%	17%	18%	18%	0%	100%	55%	57%
AM	J_NB	A473 North of the M4	29	111	666	806	29	106	962	1097	30	120	1190	1340	0%	-5%	44%	36%	3%	8%	79%	66%
AM	J_SB	A473 North of the M4	15	145	799	959	15	216	1156	1387	24	226	1470	1720	0%	49%	45%	45%	60%	56%	84%	79%
AM	K_EB	A48 East of Bridgend	41	104	394	539	41	123	604	768	42	144	693	879	0%	18%	53%	42%	2%	38%	76%	63%
AM	K_WB	A48 East of Bridgend	34	66	558	658	34	76	748	858	35	86	867	988	0%	15%	34%	30%	3%	30%	55%	50%
IP	A_EB	A4061 Newton	12	41	517	570	12	48	570	630	12	49	627	688	0%	17%	10%	11%	0%	20%	21%	21%
IP	A_WB	A4061 Newton	12	40	373	425	12	45	459	516	12	51	508	571	0%	13%	23%	21%	0%	28%	36%	34%
IP	B_NB	B40783 North of the M4	2	53	165	220	2	61	185	248	2	69	208	279	0%	15%	12%	13%	0%	30%	26%	27%
IP	B_SB	B40783 North of the M4	2	55	185	242	2	65	240	307	2	74	270	346	0%	18%	30%	27%	0%	35%	46%	43%
IP	C_NB	A48 Pyle	37	49	204	290	14	57	248	319	14	64	277	355	-62%	16%	22%	10%	-62%	31%	36%	22%
IP	C_SB	A48 Pyle	38	114	213	365	37	134	230	401	37	93	258	388	-3%	18%	8%	10%	-3%	-18%	21%	6%
IP	D_EB	A48 Stormy Down	34	88	258	380	33	102	323	458	33	114	361	508	-3%	16%	25%	21%	-3%	30%	40%	34%
IP	D_WB	A48 Stormy Down	33	77	166	276	33	89	227	349	33	100	250	383	0%	16%	37%	26%	0%	30%	51%	39%
IP	E_NB	A4062 North of the M4	7	32	337	376	7	38	393	438	8	43	416	467	0%	19%	17%	16%	14%	34%	23%	24%
IP	E_SB	A4062 North of the M4	7	36	352	395	7	39	396	442	7	44	442	493	0%	8%	13%	12%	0%	22%	26%	25%
IP	F_NB	A4063 Aberkenfig	18	52	371	441	18	61	457	536	20	72	516	608	0%	17%	23%	22%	11%	38%	39%	38%
IP	F_SB	A4063 Aberkenfig	16	48	338	402	16	54	410	480	16	61	461	538	0%	13%	21%	19%	0%	27%	36%	34%
IP	G_NB	A4061 North of the M4	32	128	490	650	31	144	590	765	30	160	680	870	-3%	13%	20%	18%	-6%	25%	39%	34%
IP	G_SB	A4061 North of the M4	18	83	518	619	19	95	602	716	19	100	675	794	6%	14%	16%	16%	6%	20%	30%	28%
IP	H_EB	B4028 East of Bryncethin	2	17	178	197	2	19	239	260	2	29	301	332	0%	12%	34%	32%	0%	71%	69%	69%
IP	H_WB	B4028 East of Bryncethin	2	43	204	249	2	53	233	288	2	55	278	335	0%	23%	14%	16%	0%	28%	36%	35%
IP	J_NB	A473 North of the M4	16	80	337	433	16	96	454	566	13	109	634	756	0%	20%	35%	31%	-19%	36%	88%	75%
IP	J_SB	A473 North of the M4	14	60	291	365	14	77	419	510	14	101	597	712	0%	28%	44%	40%	0%	68%	105%	95%
IP	K_EB	A48 East of Bridgend	29	63	196	288	29	77	317	423	29	88	387	504	0%	22%	62%	47%	0%	40%	97%	75%
IP	K_WB	A48 East of Bridgend	23	58	310	391	23	84	440	547	23	95	517	635	0%	45%	42%	40%	0%	64%	67%	62%
PM	A_EB	A4061 Newton	7	36	443	486	7	41	485	533	7	45	528	580	0%	14%	9%	10%	0%	25%	19%	19%
PM	A_WB	A4061 Newton	6	42	699	747	6	50	758	814	6	39	818	863	0%	19%	8%	9%	0%	-7%	17%	16%
PM	B_NB	B40783 North of the M4	0	70	279	349	0	82	303	385	0	92	332	424	#DIV/0!	17%	9%	10%	#DIV/0!	31%	19%	21%
PM	B_SB	B40783 North of the M4	1	41	246	288	1	48	273	322	1	55	327	383	0%	17%	11%	12%	0%	34%	33%	33%
PM	C_NB	A48 Pyle	17	51	330	398	6	60	381	447	6	68	409	483	-65%	18%	15%	12%	-65%	33%	24%	21%
PM	C_SB	A48 Pyle	11	122	397	530	11	154	478	643	11	174	497	682	0%	26%	20%	21%	0%	43%	25%	29%
PM	D_EB	A48 Stormy Down	11	54	454	519	11	74	549	634	11	84	620	715	0%	37%	21%	22%	0%	56%	37%	38%
PM	D_WB	A48 Stormy Down	17	151	381	549	16	162	439	617	16	183	489	688	-6%	7%	15%	12%	-6%	21%	28%	25%
PM	E_NB	A4062 North of the M4	4	142	560	706	4	163	663	830	4	161	732	897	0%	15%	18%	18%	0%	13%	31%	27%
PM	E_SB	A4062 North of the M4	4	34	386	424	4	40	413	457	4	45	439	488	0%	18%	7%	8%	0%	32%	14%	15%
PM	F_NB	A4063 Aberkenfig	10	114	669	793	9	125	733	867	10	72	837	919	-10%	10%	10%	9%	0%	-37%	25%	16%
PM	F_SB	A4063 Aberkenfig	11	21	297	329	11	25	371	407	11	28	417	456	0%	19%	25%	24%	0%	33%	40%	39%
PM	G_NB	A4061 North of the M4	15	159	947	1121	15	186	1003	1204	14	196	1008	1218	0%	17%	6%	7%	-7%	23%	6%	9%
PM	G_SB	A4061 North of the M4	10	77	557	644	10	81	743	834	10	115	789	914	0%	5%	33%	30%	0%	49%	42%	42%
PM	H_EB	B4028 East of Bryncethin	1	20	224	245	1	32	272	305	1	38	349	388	0%	60%	21%	24%	0%	90%	56%	58%
PM	H_WB	B4028 East of Bryncethin	1	53	546	600	1	65	600	666	3	67	716	786	0%	23%	10%	11%	200%	26%	31%	31%
PM	J_NB	A473 North of the M4	11	87	749	847	11	132	1044	1187	11	146	1472	1629	0%	52%	39%	40%	0%	68%	97%	92%
PM	J_SB	A473 North of the M4	8	54	543	605	8	66	771	845	9	93	1115	1217	0%	22%	42%	40%	13%	72%	105%	101%
PM	K_EB	A48 East of Bridgend	15	90	635	740	14	97	731	842	16	111	861	988	-7%	8%	15%	14%	7%	23%	36%	34%
PM	K_WB	A48 East of Bridgend	11	104	507	622	11	124	765	900	11	147	871	1029	0%	19%	51%	45%	0%	41%	72%	65%
OP	A_EB	A4061 Newton	4	16	146	166	4	19	167	190	4	21	168	193	0%	19%	14%	14%	0%	31%	15%	16%
OP	A_WB	A4061 Newton	4	16	99	119	4	18	130	152	4	21	143	168	0%	13%	31%	28%	0%	31%	44%	41%
OP	B_NB	B40783 North of the M4	1	20	41	62	1	23	46	70	1	27	53	81	0%	15%	12%	13%	0%	35%	29%	31%
OP	B_SB	B40783 North of the M4	1	21	45	67	1	25	58	84	1	28	66	95	0%	19%	29%	25%	0%	33%	47%	42%
OP	C_NB	A48 Pyle	11	19	51	81	11	23	64	98	4	25	71	100	0%	21%	25%	21%	-64%	32%	39%	23%

			Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	% Growth	% Growth	% Growth	% Growth	% Growth	% Growth	% Growth	% Growth
			2015	2015	2015	2015	2026	2026	2026	2026	2036	2036	2036	2036	2015-2026	2015-2026	2015-2026	2015-2026	2015-2036	2015-2036	2015-2036	2015-2036
			HGV	LGV	All Cars	All Vehicles	HGV	LGV	All Cars	All Vehicles	HGV	LGV	All Cars	All Vehicles	HGV	LGV	All Cars	All Vehicles	HGV	LGV	All Cars	All Vehicles
OP	C_SB	A48 Pyle	7	36	53	96	7	42	63	112	7	47	72	126	0%	17%	19%	17%	0%	31%	36%	31%
OP	D_EB	A48 Stormy Down	6	25	56	87	6	30	74	110	6	33	84	123	0%	20%	32%	26%	0%	32%	50%	41%
OP	D_WB	A48 Stormy Down	9	30	43	82	9	35	60	104	9	39	69	117	0%	17%	40%	27%	0%	30%	60%	43%
OP	E_NB	A4062 North of the M4	2	13	87	102	2	15	100	117	2	17	110	129	0%	15%	15%	15%	0%	31%	26%	26%
OP	E_SB	A4062 North of the M4	2	12	78	92	2	14	86	102	2	16	103	121	0%	17%	10%	11%	0%	33%	32%	32%
OP	F_NB	A4063 Aberkenfig	5	19	83	107	5	22	110	137	5	26	132	163	0%	16%	33%	28%	0%	37%	59%	52%
OP	F_SB	A4063 Aberkenfig	4	15	70	89	4	17	87	108	4	20	102	126	0%	13%	24%	21%	0%	33%	46%	42%
OP	G_NB	A4061 North of the M4	9	51	129	189	9	59	160	228	10	66	176	252	0%	16%	24%	21%	11%	29%	36%	33%
OP	G_SB	A4061 North of the M4	5	34	138	177	5	39	169	213	7	45	196	248	0%	15%	22%	20%	40%	32%	42%	40%
OP	H_EB	B4028 East of Bryncethin	1	7	42	50	0	8	46	54	0	8	56	64	-100%	14%	10%	8%	-100%	14%	33%	28%
OP	H_WB	B4028 East of Bryncethin	1	18	53	72	1	21	57	79	1	24	67	92	0%	17%	8%	10%	0%	33%	26%	28%
OP	J_NB	A473 North of the M4	4	25	82	111	4	34	113	151	3	38	167	208	0%	36%	38%	36%	-25%	52%	104%	87%
OP	J_SB	A473 North of the M4	4	24	66	94	4	29	105	138	4	34	162	200	0%	21%	59%	47%	0%	42%	145%	113%
OP	K_EB	A48 East of Bridgend	6	22	45	73	6	26	78	110	6	31	96	133	0%	18%	73%	51%	0%	41%	113%	82%
OP	K_WB	A48 East of Bridgend	6	22	75	103	6	31	109	146	6	35	133	174	0%	41%	45%	42%	0%	59%	77%	69%
24Hr	A_EB	A4061 Newton	167	597	7368	8132	167	699	8272	9138	167	749	8767	9683	0%	17%	12%	12%	0%	25%	19%	19%
24Hr	A_WB	A4061 Newton	169	588	6379	7135	167	669	7601	8437	169	722	8332	9224	-1%	14%	19%	18%	0%	23%	31%	29%
24Hr	B_NB	B40783 North of the M4	32	804	2568	3403	32	928	2843	3803	32	1061	3176	4269	0%	15%	11%	12%	0%	32%	24%	25%
24Hr	B_SB	B40783 North of the M4	32	850	3070	3952	32	1003	3682	4717	32	1135	4178	5345	0%	18%	20%	19%	0%	33%	36%	35%
24Hr	C_NB	A48 Pyle	449	986	3460	4895	285	1158	4234	5677	194	1284	4641	6120	-37%	17%	22%	16%	-57%	30%	34%	25%
24Hr	C_SB	A48 Pyle	424	1676	3618	5718	407	1994	4162	6563	405	1896	4470	6771	-4%	19%	15%	15%	-5%	13%	24%	18%
24Hr	D_EB	A48 Stormy Down	376	1193	4514	6083	362	1425	5474	7260	357	1577	6049	7983	-4%	19%	21%	19%	-5%	32%	34%	31%
24Hr	D_WB	A48 Stormy Down	446	1357	3201	5003	441	1544	4146	6131	443	1732	4615	6790	-1%	14%	30%	23%	-1%	28%	44%	36%
24Hr	E_NB	A4062 North of the M4	97	783	5597	6477	95	908	6433	7436	103	970	6907	7980	-2%	16%	15%	15%	6%	24%	23%	23%
24Hr	E_SB	A4062 North of the M4	104	675	5094	5873	104	773	5784	6661	106	887	6690	7683	0%	14%	14%	13%	2%	31%	31%	31%
24Hr	F_NB	A4063 Aberkenfig	239	921	5775	6934	241	1057	6946	8244	255	1062	7946	9263	1%	15%	20%	19%	7%	15%	38%	34%
24Hr	F_SB	A4063 Aberkenfig	229	643	5187	6059	231	739	6274	7244	234	866	6939	8039	1%	15%	21%	20%	2%	35%	34%	33%
24Hr	G_NB	A4061 North of the M4	426	1990	8081	10497	414	2287	9554	12254	423	2526	10468	13417	-3%	15%	18%	17%	-1%	27%	30%	28%
24Hr	G_SB	A4061 North of the M4	241	1513	8329	10082	245	1716	9775	11736	273	1952	10687	12911	2%	13%	17%	16%	13%	29%	28%	28%
24Hr	H_EB	B4028 East of Bryncethin	36	329	2900	3264	21	400	3768	4189	23	503	4643	5169	-42%	22%	30%	28%	-36%	53%	60%	58%
24Hr	H_WB	B4028 East of Bryncethin	32	658	3864	4553	32	792	4337	5161	37	881	5251	6168	0%	20%	12%	13%	15%	34%	36%	35%
24Hr	J_NB	A473 North of the M4	238	1256	6336	7830	238	1565	8794	10597	209	1759	12096	14065	0%	25%	39%	35%	-12%	40%	91%	80%
24Hr	J_SB	A473 North of the M4	188	1120	5654	6962	188	1471	8257	9917	210	1767	11576	13552	0%	31%	46%	42%	12%	58%	105%	95%
24Hr	K_EB	A48 East of Bridgend	378	1107	4139	5624	376	1301	5985	7662	382	1512	7144	9038	-1%	18%	45%	36%	1%	37%	73%	61%
24Hr	K_WB	A48 East of Bridgend	317	1027	5269	6613	317	1369	7523	9210	319	1564	8811	10695	0%	33%	43%	39%	1%	52%	67%	62%

MOTT MACDONALD

Bridgend Replacement Local Development Plan

Technical Note Series

Project:	Bridgend Replacement LDP		
Our reference:	100415574 – TN 007	**Your reference:**	
Prepared by:	Claudia Currie	**Date:**	May 2021
Approved by:	Claudia Currie	**Checked by:**	Margaret Henderson
Subject:	Highway Improvements to Mitigate Development Impact on Existing Highway Network - to achieve a nil detriment scenario accommodating Candidate Sites.		

1 Introduction

Mott MacDonald was commissioned in January 2020 by Bridgend County Borough Council to develop a series of technical notes to help inform the supporting evidence for the Replacement Local Development Plan.

Each technical note details the work that has been completed, draws conclusions and makes recommendations for further analysis in order to inform the development of the Replacement Bridgend Local Development Plan.

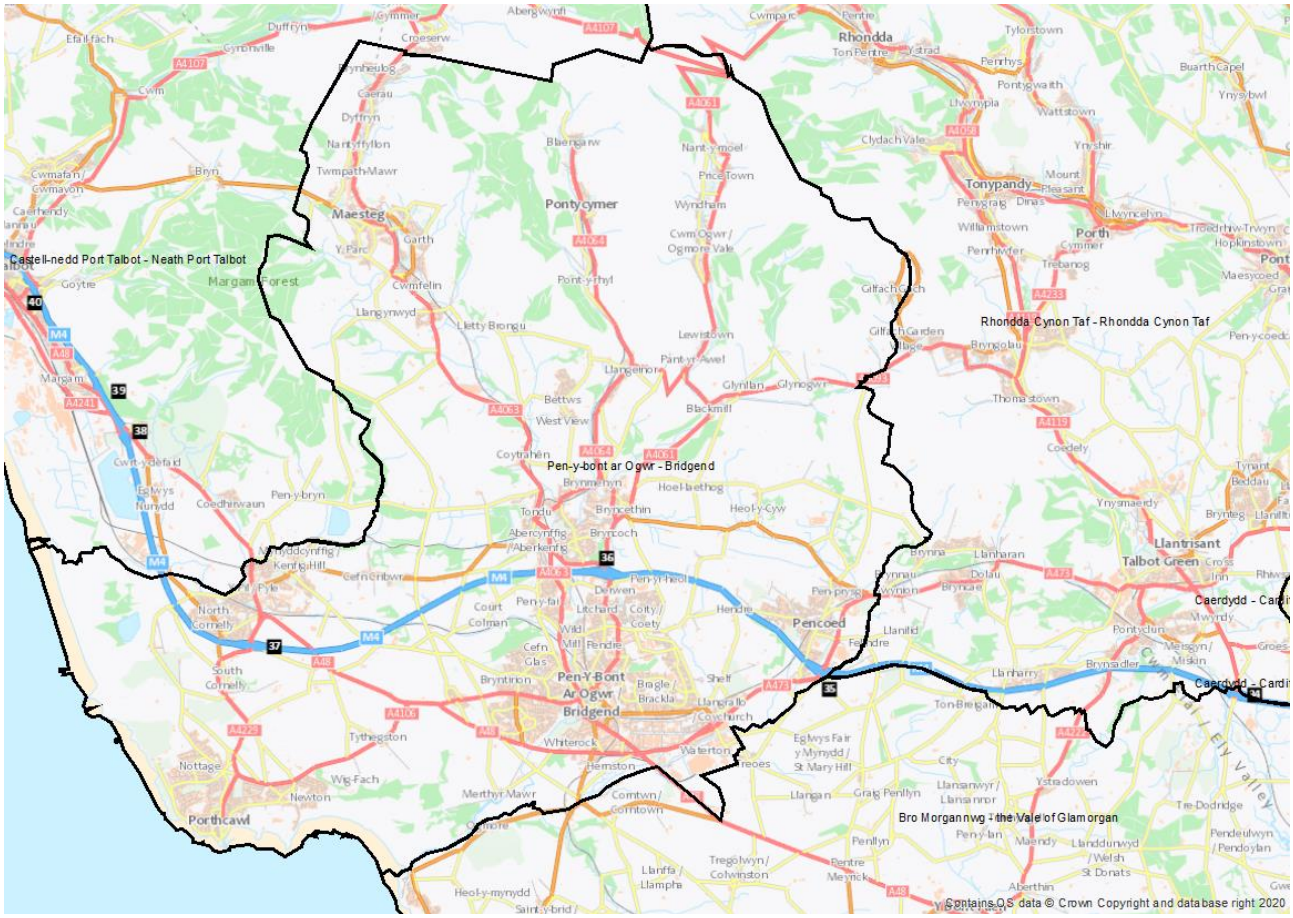
Technical Note 7 investigates a range of possible solutions to facilitate all proposed development so that the transport network in BCBC is no worse than the base position with all committed development in place - the nil detriment scenario. The solutions aim to enhance sustainable connectivity throughout the strategic transport network and to achieve modal shift away from the private car and towards public transport and active travel.

2 Location

The Welsh Government (WG) is the highway authority that is responsible for the motorway and trunk roads in Wales. The M4 motorway is a three lane highway that runs east and westbound across the middle of the Bridgend County Borough Council unitary authority area.

Bridgend County Borough Council (BCBC), is bounded by the Bristol Channel to the south and three unitary authority areas; to the north and west is Neath Port Talbot, to the north and east is Rhondda Cynon Taff and to the east is The Vale of Glamorgan, as shown in Figure 1.

FIGURE 1: Bridgend Area



Source: Mott MacDonald; ArcMap

3 Highway Improvements linked to Committed Developments

A comprehensive review of the Committed Development Planning Applications has identified that there are no significant highway improvements proposed that would provide sufficient spare capacity to accommodate any additional developments over and above those linked to the Planning Applications. This is as would be expected as BCBC follow the nil-detriment approach to highway impact from any development and endeavour to ensure all Developments are conditioned to reasonable and appropriate highway improvements, should the need arise.

The Planning Applications identified in the process of building up a comprehensive picture of the Committed Developments that have extant Planning Permission generally appear to only include new, and improved access arrangements to enable the development to access/egress the BCBC highway network.

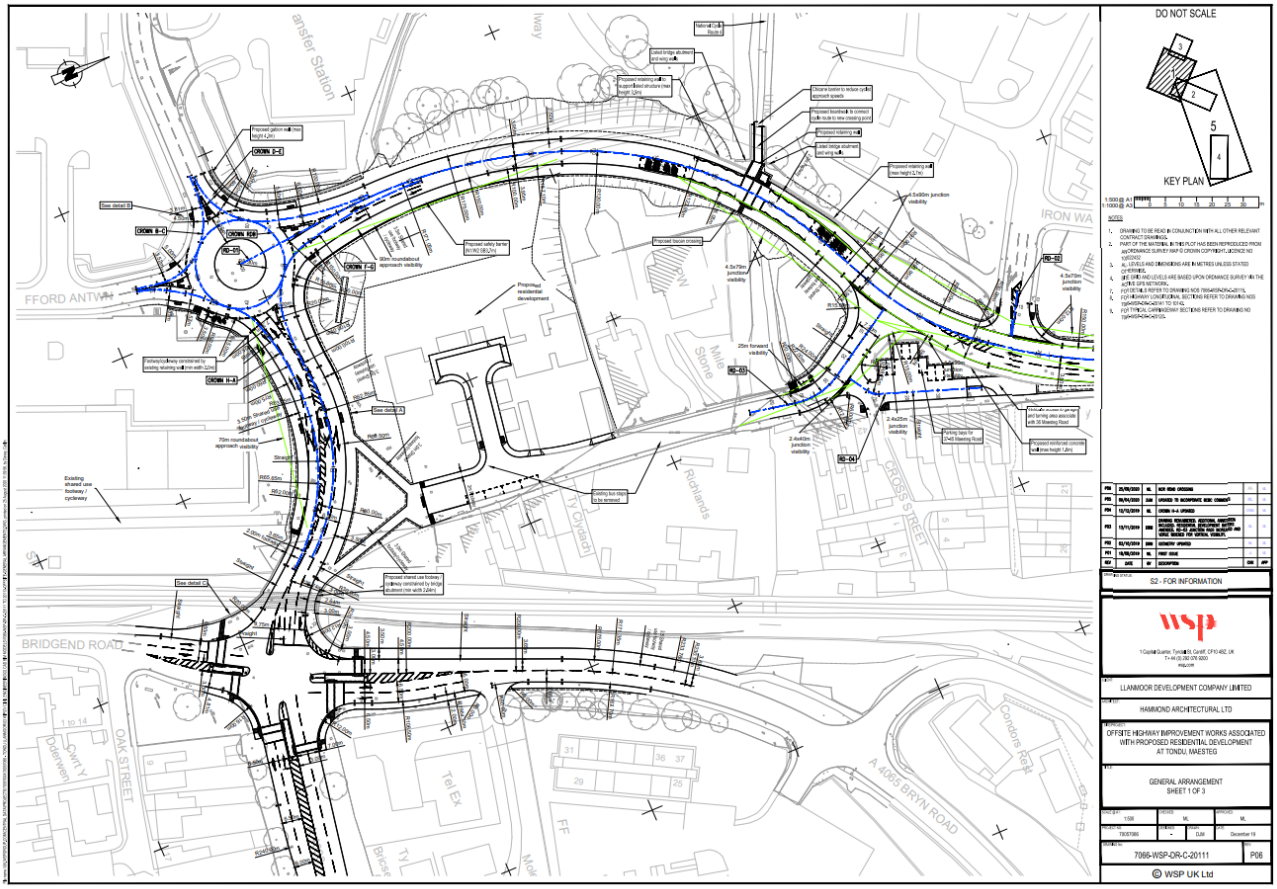
However, five locations (see Appendix A) do provide comprehensive proposals for highway improvements as mitigation measures to achieve a ‘nil detriment’ situation and these are detailed below with their associated development.

- **Lidl at Tondu** – (Reference: Vectos April 2016 – Merthyr Mawr Estates Land West of Maesteg Road, Tondu)
  This site proposes a signal controlled junction at Maesteg Road/Bryn Road/ Bridgend Rd/ A4063. An access roundabout with Pentre Felin (Lidl), a new link road and an improved roundabout junction between the A4063/Tondu Road/B4281.

  This is a replacement for the existing Junction 22 that has been modelled in Technical Notes 3 and 4.

  The proposed layout is shown in Figure 2.

  Figure 2: Proposed Improvements in Tondu



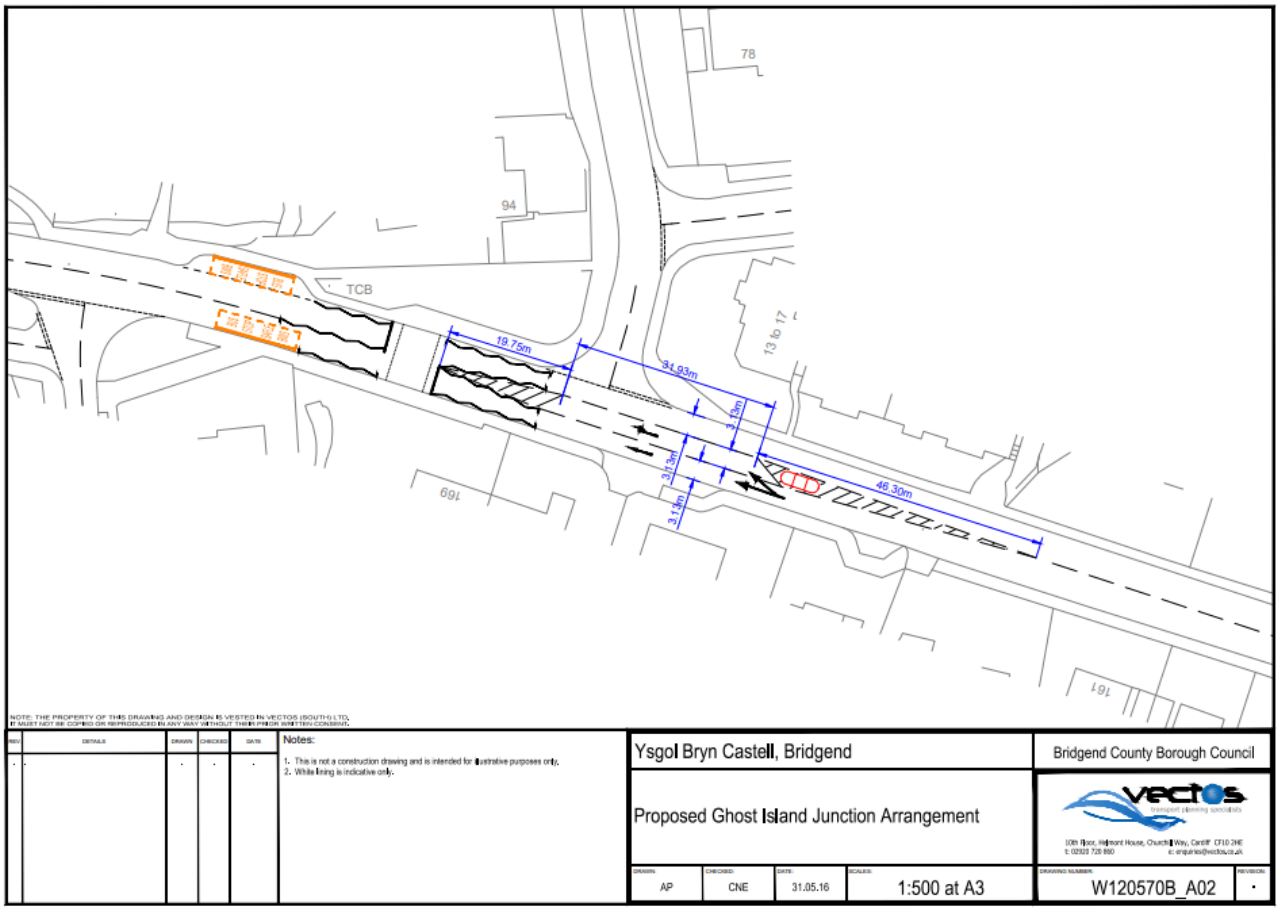
Source: BCBC

- **Ysgol Bryn Castell** (Reference Vectos June 2016 – GVA Grimley W120570B) as part of its Phase 2 development has proposed an upgrade to the junction for the Heol Y Nant/Park Street Priority Junction.

  This is a replacement for the existing junction 13 that has been modelled in Technical Notes 3 and 4.

The proposed layout is shown in Figure 3.

Figure 3: Proposed Ghost Island Arrangement



Source: Vectos Tech Note June 2016 Ysgol Bryn Castell – Phase 2

- **Island Farm Sports Village** (Reference Opus February 2011 – Environmental Statement Appendix 6.1) The proposed develop was intended to be a leading Sports and Leisure Venue with some associated residential developments and is currently progressing as a Candidate Site, but with a reduced footprint. As part of the original proposals the following junction improvements were required to ensure the phased development could be accommodated on the highway network.

  These are a replacement for the existing roundabout junctions 18 and 4 that have been modelled in Technical Notes 3 and 4.

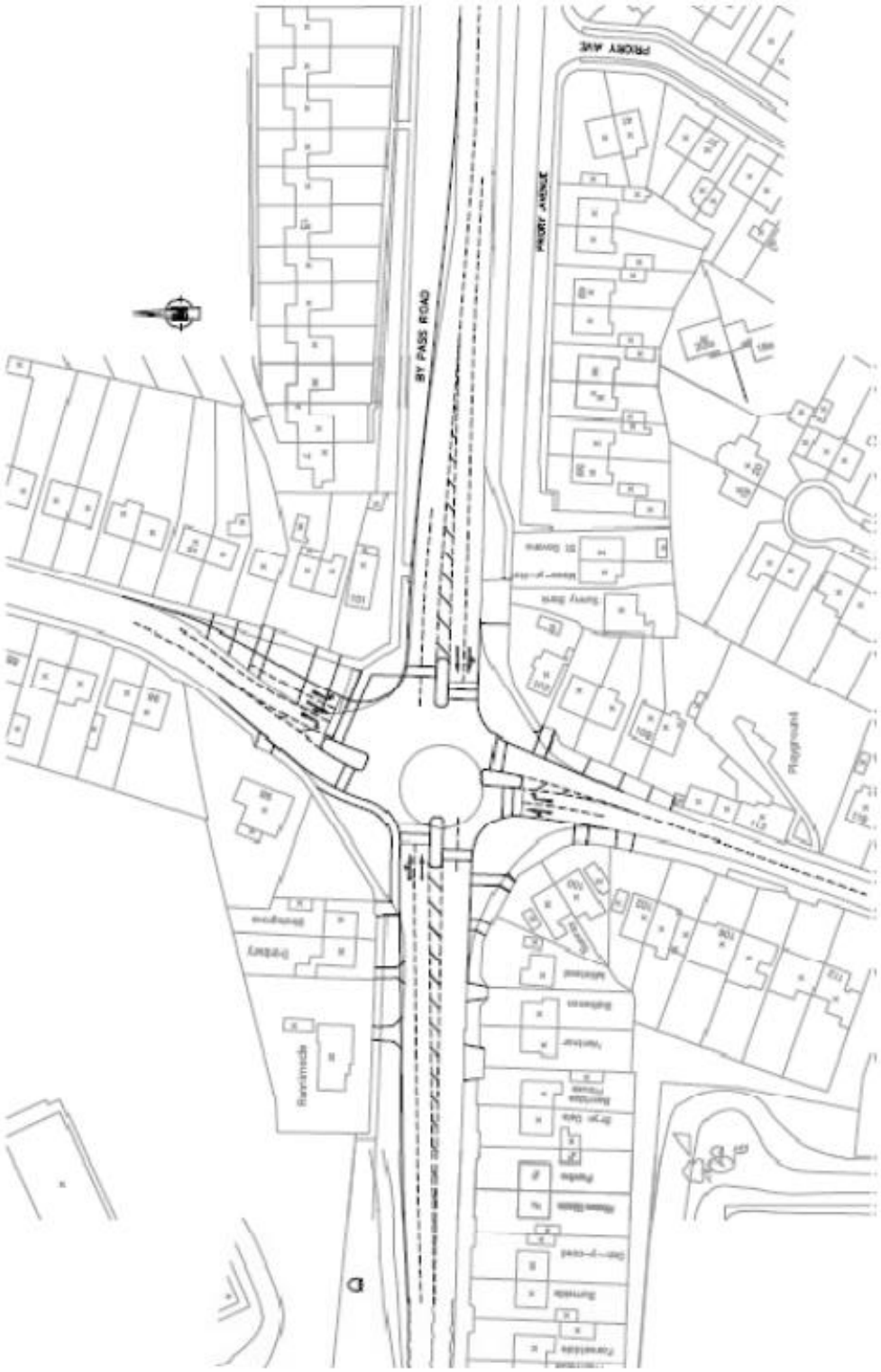
  The proposed layouts are shown in Figures 4 and 5.

Figure 4:Broadlands Roundabout enlarged junction layout

Source: Reference Opus February 2011 – Environmental Statement Appendix 6.1) Figure 7.4

It should also be noted that this improvement will also be used to facilitate the proposed Planning Application for **Craig Y Parcau.**

Figure 5: Ewenny signalised crossroads layout (Option 3)



Source: Reference Opus February 2011 – Environmental Statement Appendix 6.1) Figure 7.

4 Additional Highway Improvements Required and Linked to Candidate Sites

A comprehensive review of the Transport Assessments for all the proposed Candidate Sites has identified that there are no significant highway improvements proposed that would provide sufficient spare capacity to accommodate any additional developments over and above those linked to the Candidate Site. These proposals are predicted to fulfil the expectations held by BCBC that the nil-detriment approach to highway impact from developments will be achieved.

However, the cumulative impact of these developments has identified a number of junctions that require improvements (See Technical Note 4). Below are a series of sketches of possible improvements, largely within the existing highway boundary, which will significantly improve the operation of the highway network should all the developments be constructed within the Plan Period. These proposals, shown in Appendix B, are generally

- online widening on the approaches and circulating carriageway at existing roundabouts
- dedicated left turn slips at existing signal controlled junctions
- general signal improvements: optimisation, double cycling, MOVA, pedestrian detectors
- a new junction at Parc Avon Ewenny Industrial Estate

The junctions will be still operate over theoretical capacity in some situations, but the improvements identified will enable the ‘nil detriment’ situation to be achieved and will minimise delays on the BCBC highway network, although some delays may remain.

A combination of a number of transport planning measures, as detailed below, in addition to the proposed highway improvement would also help to minimise the impact of both committed and candidate sites on the BCBC highway network, although the impact would not be entirely eliminated.

- Modal shift to active travel or public transport
- Rerouting to less congested routes (reassignment and rat-running)
- Retiming of journeys outside of the prevailing peak hour (peak spreading). There is anecdotal evidence that large office based workforces are being offered ‘agile working’ opportunities such that they are able to flex the start and end times of their working day.
- Increased take up of remote working in line with WG 2021 Transport Strategy which aims to achieve 30% remote (local hub and home) working by 2040 on a regular basis (Ref: Llwybr Newydd p15 - Priority 1).

However, to ensure the future operation of the BCBC highway network the suggested improvements detailed below should be developed further to enable all of the propose Candidate Sites to be included at the required scale within the BCBC LDP plan period (2033).

Technical Note 4 highlights that there are no major concerns with the operation of the following junctions and therefore there are no proposed improvements developed within this Technical Note as they have not been identified as necessary in order to deliver the planned LDP Candidate Sites.

Table 1: Survey Locations with no proposed improvement

Ref No	Survey Location	Junction Type
1	A4229 Pyle Rd/A4106 Newton Nottage Rd/A4106/Fulmar Rd	Roundabout
8	A4061 Rotary International Way/B4181 Tremains Road/Boulevard De Villenave/Coity Road	Signalised gyratory
9	A4061/A473/Tondu Road roundabout	Roundabout
19	A48 Crack Hill/Brocastle Manor	Roundabout
20	A48 Crack Hill/B4524 Corntown Road	Priority junction
21	A4229/A48/Pyle Road	Roundabout
25	A4093/A4061/Heol Pant-Yr-Arwel	Priority junction
26	Penybont Road/Hendre Road/Coychurch Road/Heol-Y-Groes	Priority junction

In addition the roundabout at A4061/McArthur Glen (Junction 14) does not have any proposed improvements included in this Technical Note as due to its proximity to Junction 36 of the M4 it would be addressed as part of the current WelTAG study commissioned by Welsh Government, which is due to be reported in mid 2021.

Technical Note 4 highlights that there are some concerns with the operation of the following roundabouts and priority junctions and therefore there are proposals to provide some widening of the approaches and exits. Schematic plans of the proposals at these junctions are show in Appendix B.

At Pyle, Junction 21 which is just north of M4 J37, it should also be noted that the possibilities of a Park and Ride Development have previously been explored. However, any model shift that this would allow has not been used to reduce the impact on junctions in this area, to ensure a worst case scenario is assessed.

Table 2: Survey Locations with proposed improvements

Ref No	Survey Location	Junction Type
2	A48/A4106 Bridgend Road roundabout	Roundabout
3	A48/A473 roundabout	Roundabout
7	A4061/Heol Stradling/W Plas Rd roundabout	Roundabout
15	A4061/Litchard Hill/Heol Y Groes	Roundabout
23	A4063/Park Road	Roundabout
24	A4061/Heol Canola	Priority junction

Technical Note 4 highlights issues at adjacent junctions 10, 11 and 12 (see Appendix A) which are three priority junctions in close proximity to each other that could experience a level of peak time congestion (TN4 - Table 4A). This is likely to be unacceptable as any additional congestion in this Air Quality Management Area will not be allowed. A separate study has been commissioned and will report on possible improvements to the operation of these junctions later in 2021. It is likely that modal shift changes would have the most beneficial improvement on the operation of these junctions which are all close to the centre of Bridgend town.

Technical Note 4 also highlights that there are concerns with the operation of some of the signal controlled roundabouts (Table 3) which will all have problems as a result of the Committed Developments and this would be exacerbated by the addition of the proposed Candidate Sites. These junctions will require significant optimisation to improve their operation in the future when all

the committed and Candidate Site developments are in place at the end of the plan period. This will bring the operation of these junctions back to a 'nil-detriment' level of operation, but there will be small delays remaining at times in some of the peak periods (less than 10 minutes in 2033).

Table 3: Survey Locations needing signal optimisation

Ref No	Survey Location	Junction Type
5	A473/A48 Roundabout	Roundabout
6	A473 Waterton Road / Brocastle Avenue/ A473 Waterton Road/ B4181 Coychurch Road	Roundabout
16	A473/B4622/Bright Hill	Priority junction
17	A483 Cowbridge Road/B4265 Ewenny Road/ A473 Langenau Strasse/Nolton Street	Priority junction

In addition, a high level sensitivity test on the traffic signal times would suggest that an increase in the signal times to allow for double cycling would also significantly improve the level of congestion experienced to levels only slightly above existing levels especially if the adjacent junctions are deigned to work in a symbiotic way. For example linking of the junctions 4, 5 and 6 (see Appendix A) on the A48/A473 urban dual carriageway in this way would help futureproof the operation of the highway network in this south-eastern area of the county close to the main industrial estate locations.

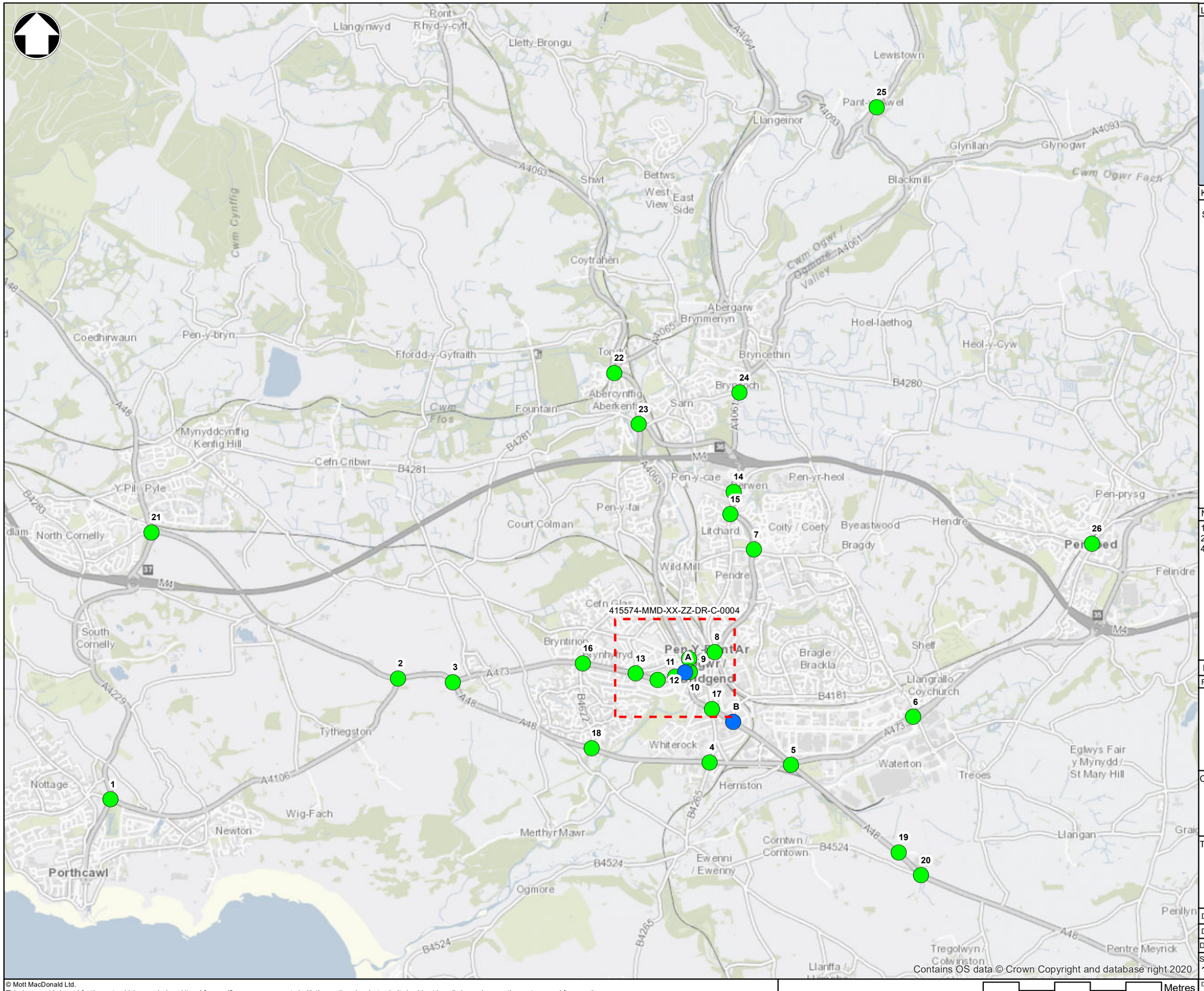
5 Conclusion

Technical Note 7 has summarised the highway improvements that are likely to be required to deliver the Committed Developments and proposed Candidate Sites and has confirmed that the proposed improvements linked to specific developments are appropriate and that other proposed mitigation can be accommodated within existing highway boundaries.

6 Recommendation

With the delivery of the proposed highway improvements identified as part of extant planning permissions and those considered in this Technical Note, together with model shift initiatives supported by the WG Transport Strategy 2021, the proposed Candidate Sites will be able to be accommodated on the BCBC highway network with the implementation of a number of junction improvements. The financial contribution from each development needed for these developments is apportioned in Technical Note 9.

A. Appendix A – Survey Location Plan



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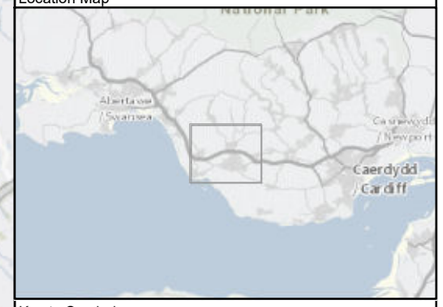
Location Map



Key to Symbols

Survey locations

- ATC
- JTC

Notes

1. For information only.
2. To be read in conjunction with: 415574-MMD-XX-ZZ-DR-C-0004

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	25/01/21	JW	For information	MH	CC

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Client: Bridgend County Borough Council

Title: Bridgend Traffic Survey Scoping Survey Locations

Designed	J Wu	JW	Eng. Check	M Henderson	MH
Drawn	J Wu	JW	Coordination	M Henderson	MH
Dwg Check	J Keane	JK	Approved	C Currie	CC

Scale at A3	Status	Rev	Security
1:50,000	INF	P1	STD

Drawing Number: 415574-MMD-XX-ZZ-DR-C-0003

Metres: 0 500 1,000 1,500 2,000 2,500

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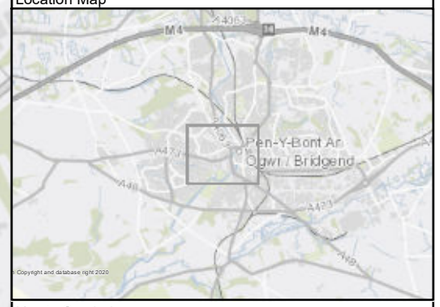
Location Map



Key to Symbols

Survey locations

- ATC
- JTC

Notes

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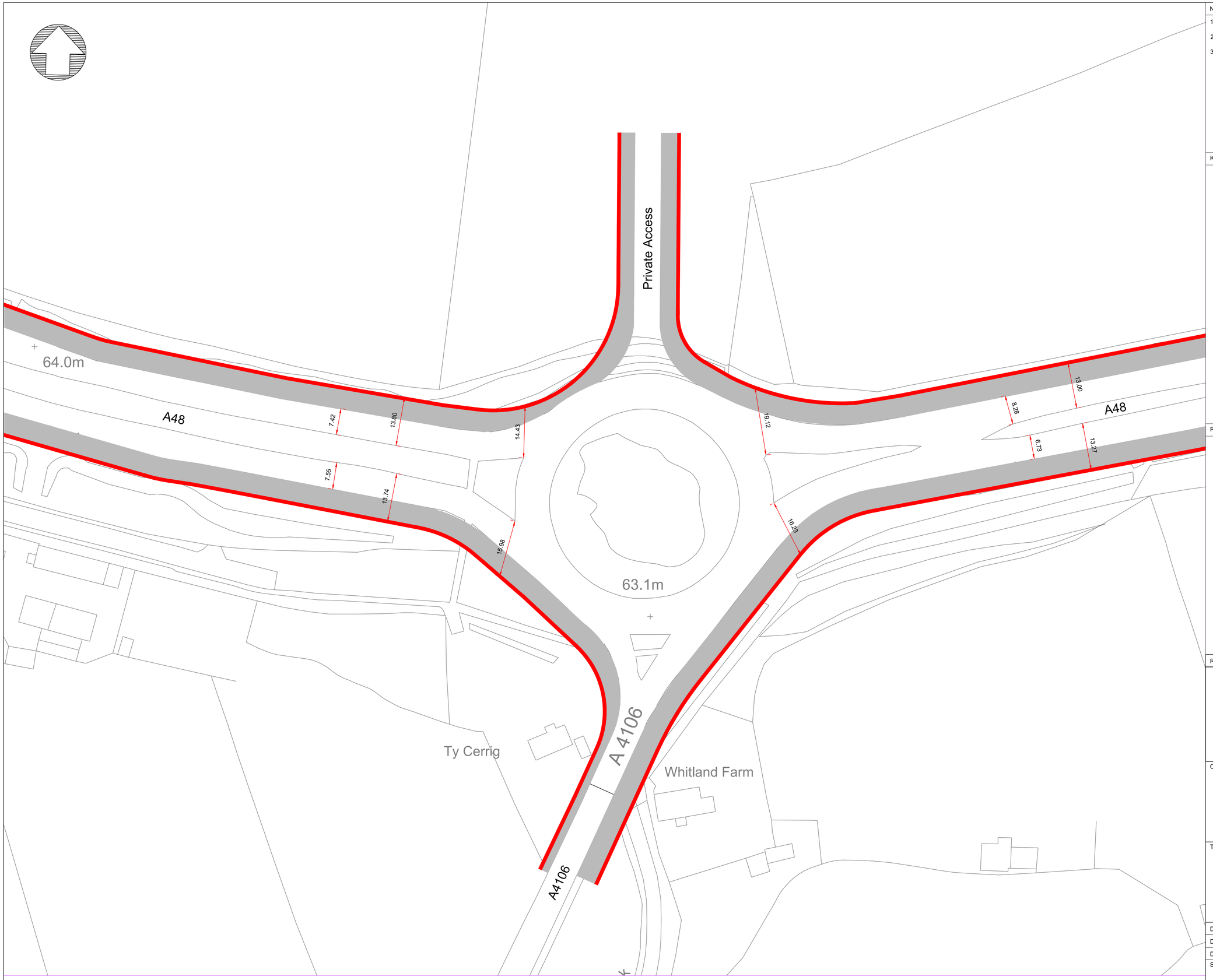
Appendix B – Possible Highway Improvement Proposals



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Title
Replacement LDP
Junction 2
A48/A4106 Bridgend Road Roundabout

Designed	Tom Dove	TD	Eng check	N/A	N/A
Drawn	Tom Dove	TD	Coordination	N/A	N/A
Dwg check	Claudia Currie	CC	Approved	Claudia Currie	CC

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Drawing Number
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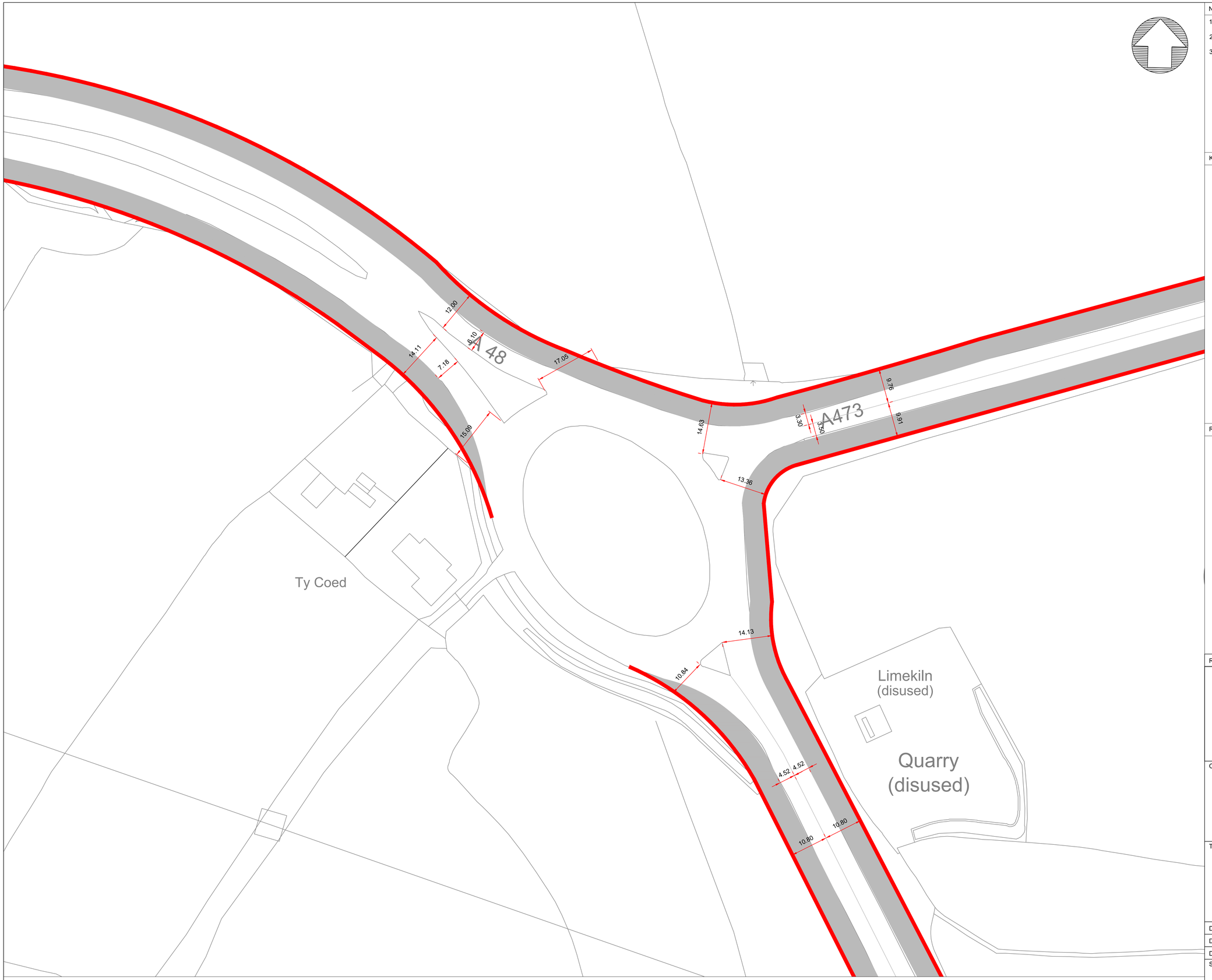

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Bridgend County Borough Council

Title
Replacement LDP
Junction 3
A48/A473 Roundabout

Designed	Tom Dove	TD	Eng check	N/A	N/A
Drawn	Tom Dove	TD	Coordination	N/A	N/A
Dwg check	Claudia Currie	CC	Approved	Claudia Currie	CC

Scale at A1	Status	Rev	Security
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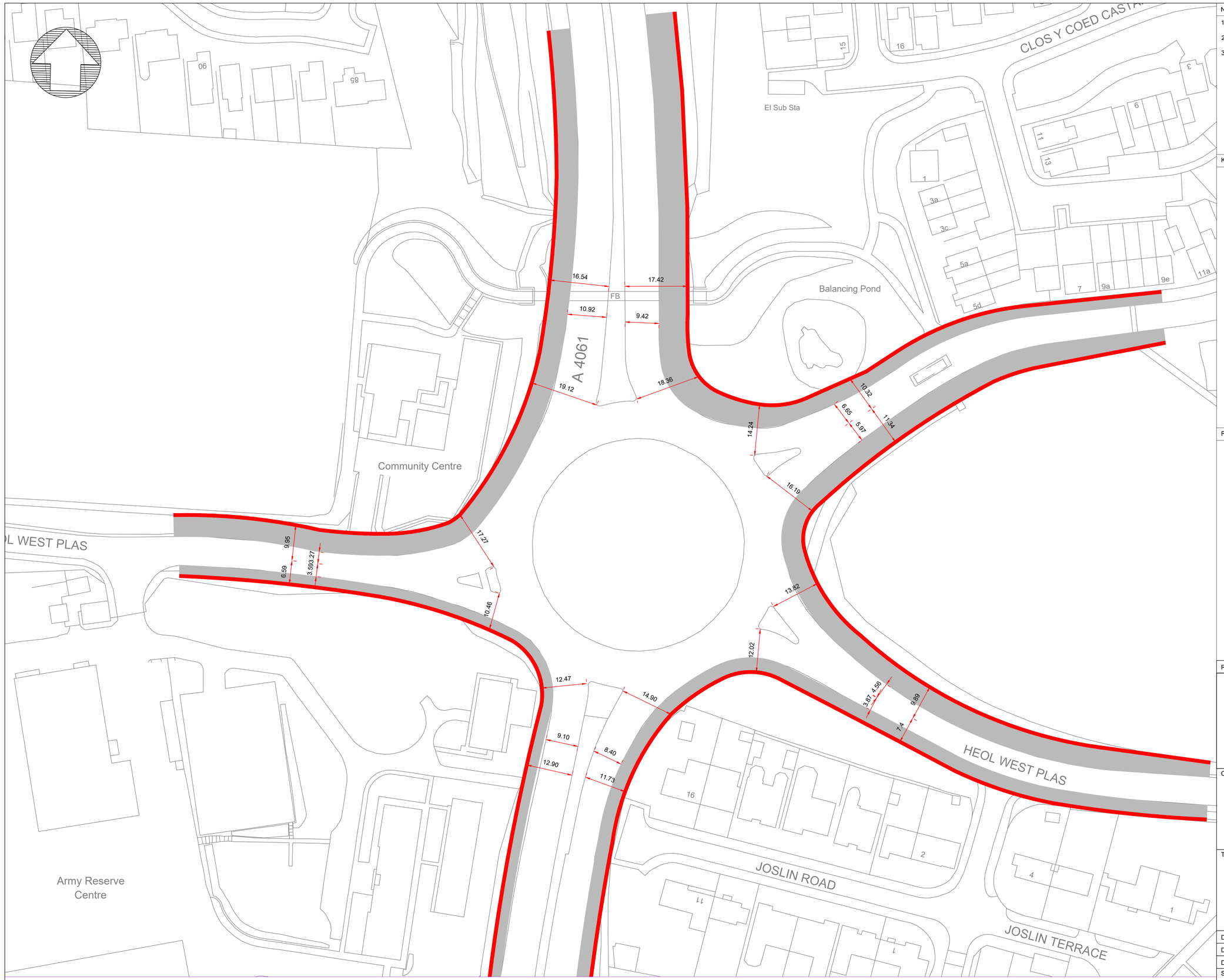

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Client

Bridgend County Borough Council

Title

Replacement LDP
Junction 7
A4061/Heol Stradling/W Plas Rd
Roundabout

Designed	Tom Dove	TD	Eng check	N/A	N/A
Drawn	Tom Dove	TD	Coordination	N/A	N/A
Dwg check	Claudia Currie	CC	Approved	Claudia Currie	CC

Scale at A1	Status	Rev	Security
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Drawing Number

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Sea View
LITCHARD
Path (um)
Drain
Path (um)
CG
The Old Barn
Fronwen
Trewen
New Barn
Brynteg
TURBERVILLE CRESCENT
18
1
25
1
24
14.00
7.90
13.49
7.31
16.31
14.47
78.6m
45
47
43
41
40
6.15
8.08
5.04
12.66
11.11
13.44
17.71
A4061
9.68
15.58
16.51
9.24
15.09
13
18
PENYLAN
21
22
2
1
Litchard Villas
17.73
13.46
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23
39
29
Shelter
Hill Crest
145
144
Westmead
146
147
148
149
141
FFORDD-Y-PARC
4.07
4.27
El Sub Sta
7.41
5.54
Dundridge
73.5m
28
1
6

Notes

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Title
Replacement LDP
Junction 15
A4061/Litchard Hill/Heol Y Groes

Designed	Tom Dove	TD	Eng check	N/A	N/A
Drawn	Tom Dove	TD	Coordination	N/A	N/A
Dwg check	Claudia Currie	CC	Approved	Claudia Currie	CC

Scale at A1	Status	Rev	Security
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Drawing Number
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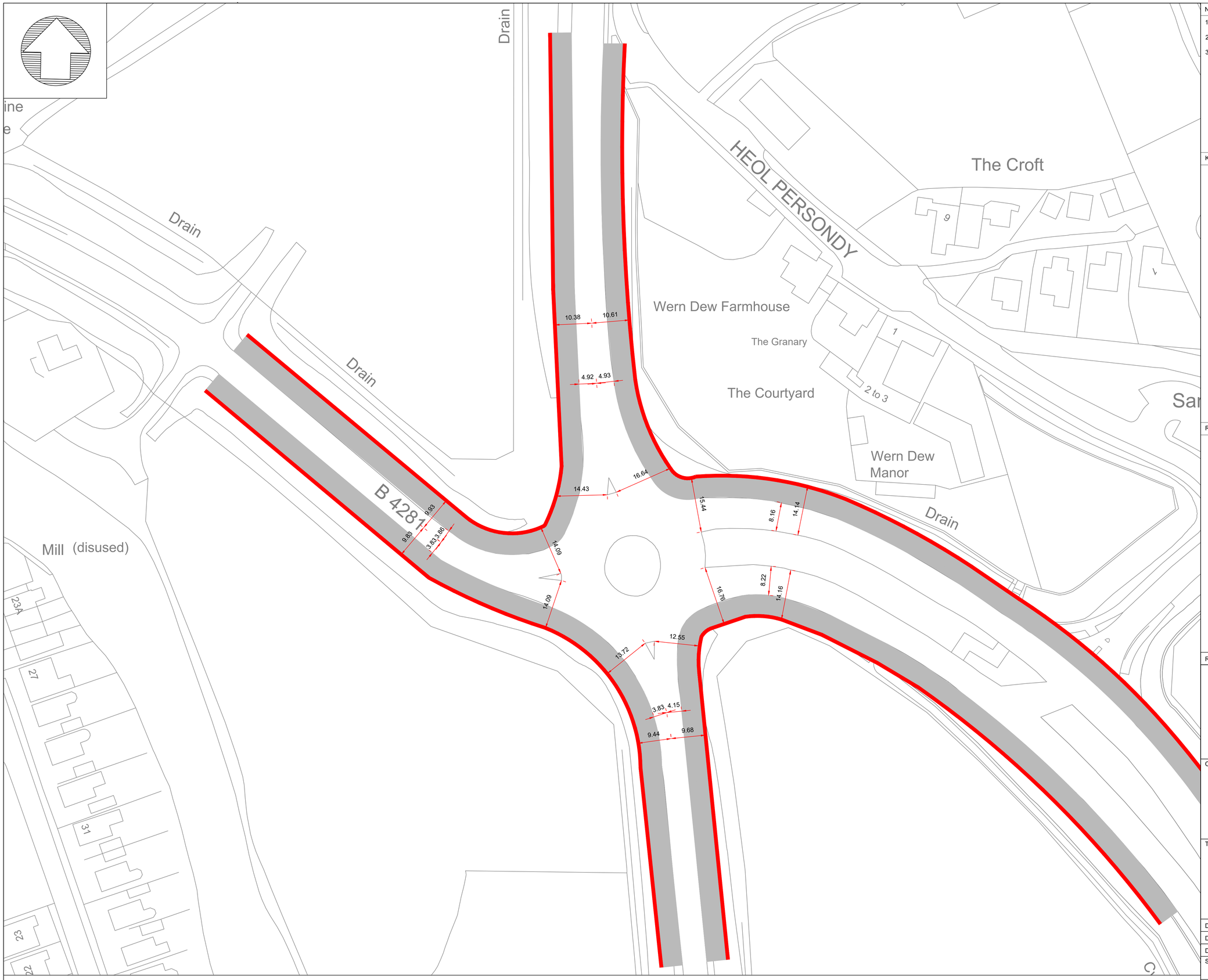

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Title

Replacement LDP
Junction 23
A4063/Park Road

Designed	Tom Dove	TD	Eng check	N/A	N/A
Drawn	Tom Dove	TD	Coordination	N/A	N/A
Dwg check	Claudia Currie	CC	Approved	Claudia Currie	CC

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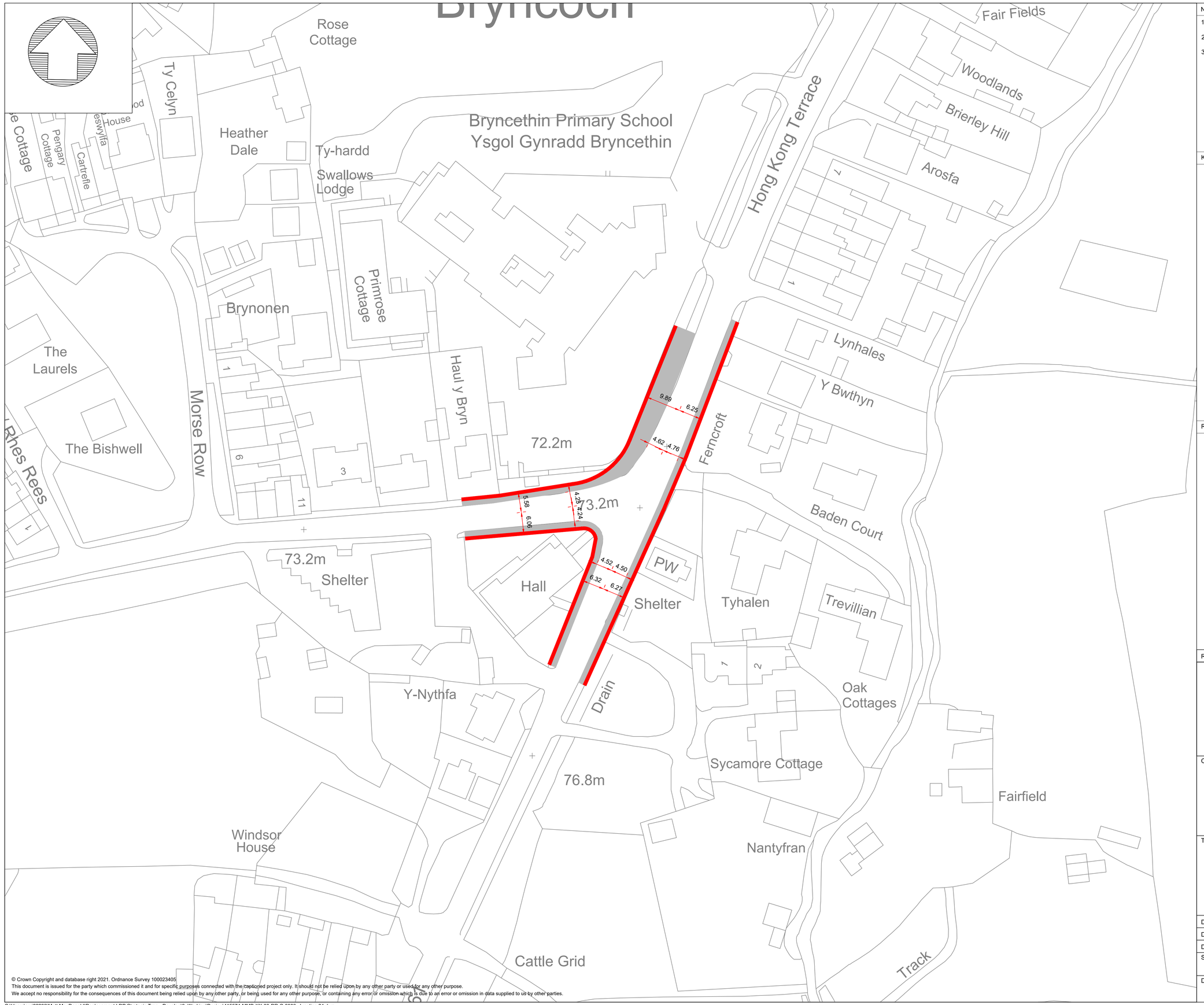

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Title
Replacement LDP
Junction 24
A4061/Heol Canola

Designed	Tom Dove	TD	Eng check	N/A	N/A
Drawn	Tom Dove	TD	Coordination	N/A	N/A
Dwg check	Claudia Currie	CC	Approved	Claudia Currie	CC

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Drawing Number
415574-MMD-XX-00-DR-C-0006

Bridgend Replacement Local Development Plan

Technical Note Series

Project:	Bridgend Replacement LDP		
Our reference:	100415574 – TN 008	**Your reference:**	
Prepared by:	Claudia Currie	**Date:**	May 2021
Approved by:	Claudia Currie	**Checked by:**	Margaret Henderson
Subject:	Identification of key junctions with currently underutilised capacity where additional developments could be considered.		

1 Introduction

Mott MacDonald was commissioned in January 2020 by Bridgend County Borough Council to develop a series of technical notes to help inform the supporting evidence for the Replacement Local Development Plan.

Each technical note details the work that has been completed, draws conclusions and makes recommendations for further analysis in order to inform the development of the Replacement Bridgend Local Development Plan.

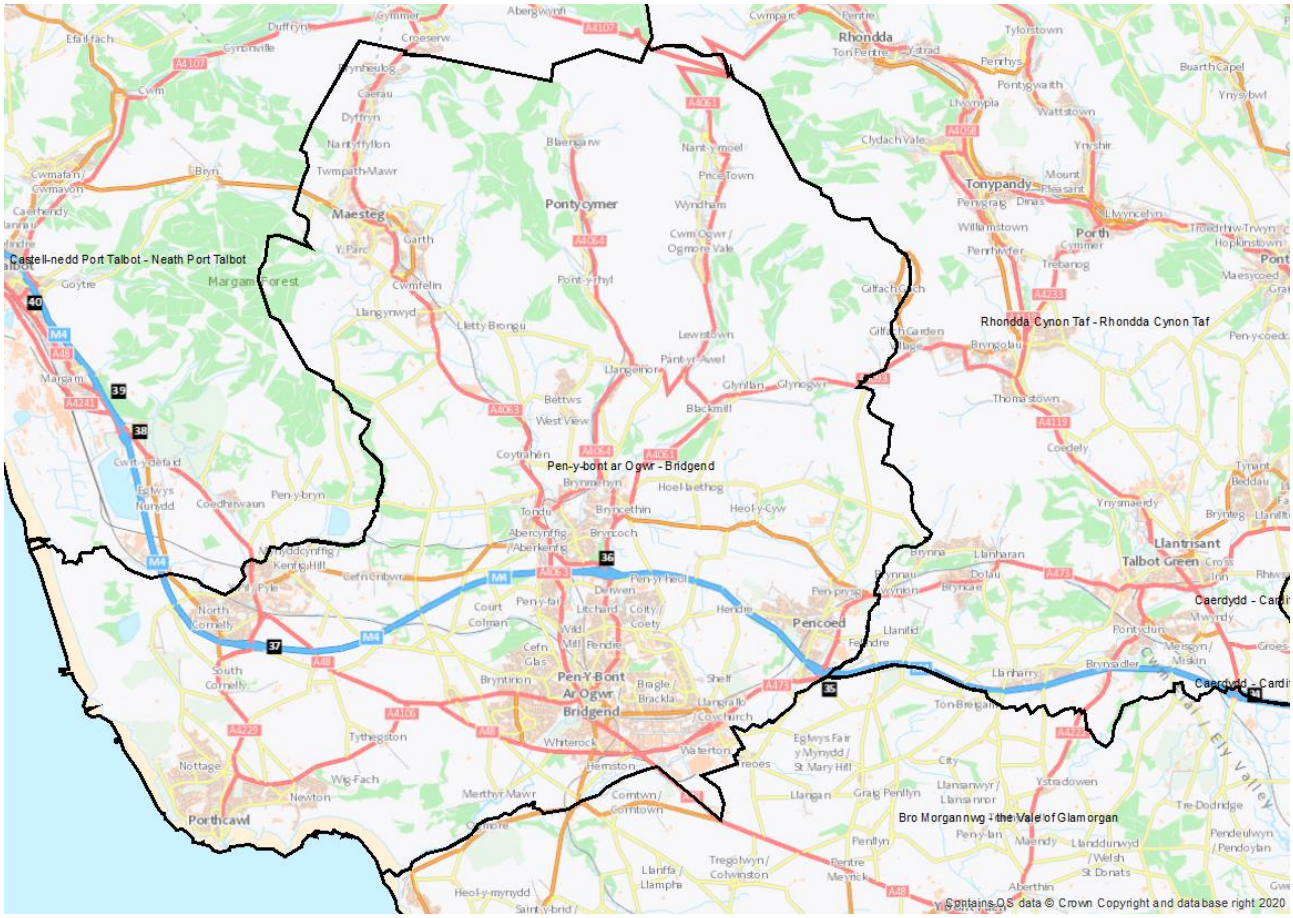
This Technical Note looks to identify any significant areas of Bridgend County Borough where additional development could be located and whether the locations selected for Candidate Sites can be supported by the proposed highway improvements.

2 Location

The Welsh Government (WG) is the highway authority that is responsible for the motorway and trunk roads in Wales. The M4 motorway is a three lane highway that runs east and westbound across the middle of the Bridgend County Borough Council unitary authority area.

Bridgend County Borough Council (BCBC), is bounded by the Bristol Chanel to the south and three unitary authority areas; to the north and west is Neath Port Talbot, to the north and east is Rhondda Cynon Taff and to the east is The Vale of Glamorgan, as shown in Figure 1.

FIGURE 1: Bridgend Area



Source: Mott MacDonald; ArcMap

3 Junctions with Underutilised Capacity

There are only three areas of BCBC where the highway network, as tested in Technical Notes 3 and 4, could accommodate additional development above what is included in the candidate sites proposal. The three principle locations are;

- Land in/around Porthcawl (Junction 1 shown in Appendix A)
- Land in/around Pantyrawel (Junction 25)
- Land around Brocastle (Junctions 19 and 20 shown in Appendix A)

However, although the area around Brocastle on the eastern fringe of Bridgend would potentially be able to accommodate further development, the impact on the Waterton Roundabout (Junction 5 shown in Appendix A) would be unacceptable without a significant shift in mode share proportions and working/travel patterns. Similarly in the town centre of Bridgend on Rotary International Way (Junction 8) would appear to have some theoretical capacity, but as it surround by other congested junctions further development would not be practical if it generated significant vehicles movements.

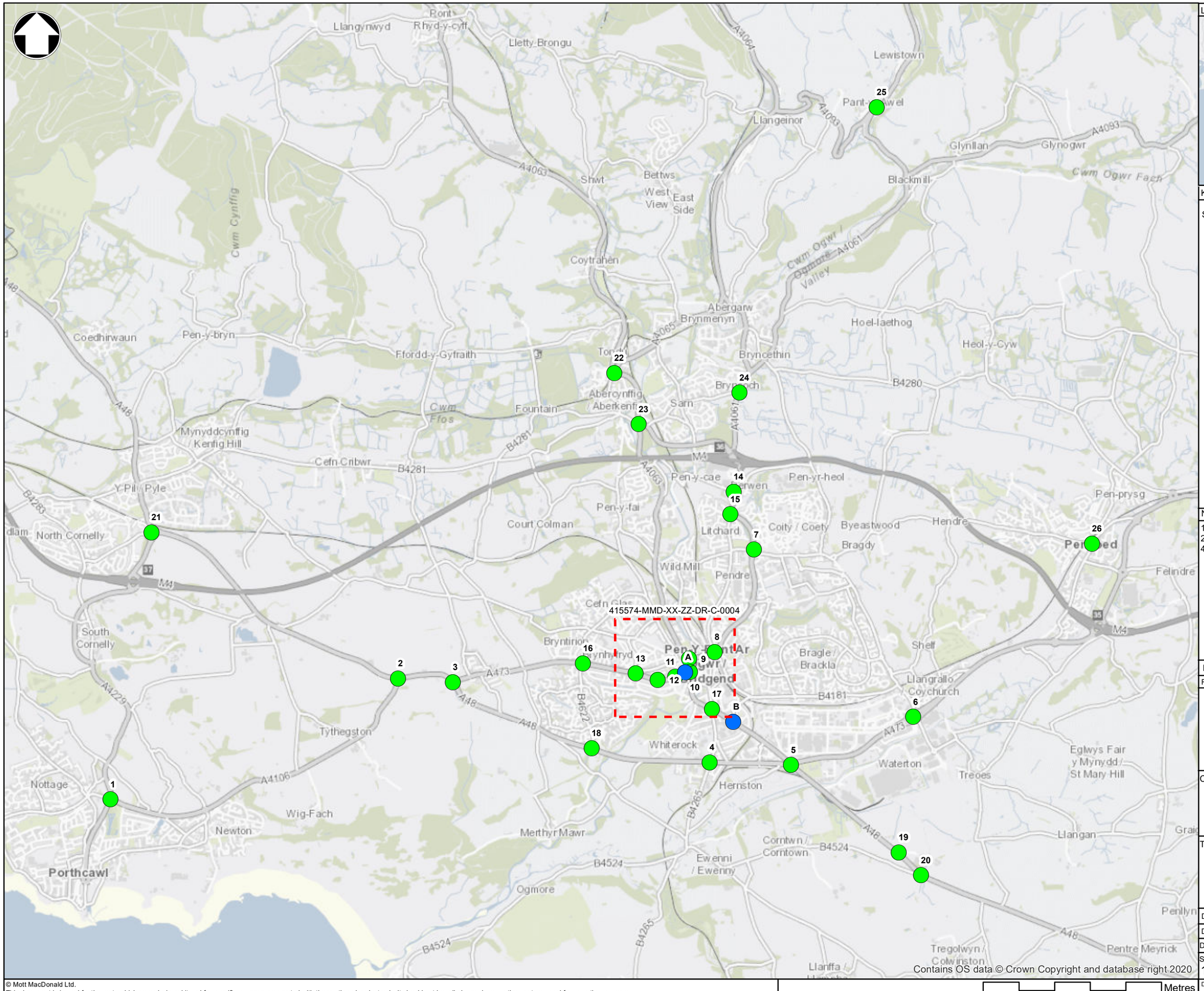
4 Conclusion

Technical Note 8 has summarised that there is limited scope to accommodate developments outside of those already committed and those identified as Candidate Sites.

5 Recommendation

Any Windfall Sites will need comprehensive Transport Assessments to demonstrate how any trip movements generated could be accommodated on the highway network through appropriate mitigation and use of public transport, active travel and remote working.

A. Appendix A – Survey Location Plan



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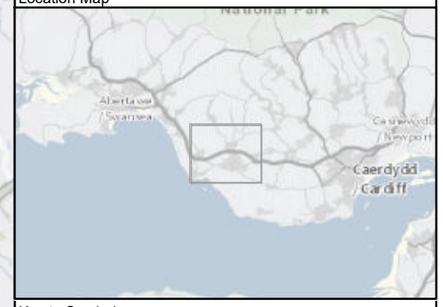
Location Map



Key to Symbols

Survey locations

- ATC
- JTC

Notes

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Client: Bridgend County Borough Council

Title: Bridgend Traffic Survey Scoping Survey Locations

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Drawn	J Wu	JW	Coordination	M Henderson	MH
Dwg Check	J Keane	JK	Approved	C Currie	CC

Scale at A3	Status	Rev	Security
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Drawing Number: 415574-MMD-XX-ZZ-DR-C-0003

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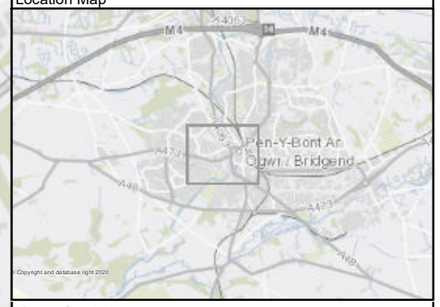
Location Map



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1. For information only.
2. To be read in conjunction with: 415574-MMD-XX-ZZ-DR-C-0003

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	25/01/21	JW	For information	MH	CC

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Client: Bridgend County Borough Council

Title: Bridgend Traffic Survey Scoping Survey Locations

Designed	J Wu	JW	Eng. Check	M Henderson	MH
Drawn	J Wu	JW	Coordination	M Henderson	MH
Dwg Check	J Keane	JK	Approved	C Currie	CC

Scale at A3	Status	Rev	Security
1:5,000	INF	P1	STD

Drawing Number: 415574-MMD-XX-ZZ-DR-C-0004

Metres: 0 50 100 150 200 250

C:\Users\wu64619\Mott MacDonald\Replacement LDP Strategic Tran - Do\Develop\9. Drawings\GIS\03.Working Drawings\415574-MMD-XX-ZZ-DR-C-0004.mxd