

Land East of Cowbridge Road  
St Athan  
Vale of Glamorgan

**astro**

Transport Assessment

October 2017

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## Revision History

Issue 1	29 <sup>th</sup> September 2016	
Issue 2	30 <sup>th</sup> September 2016	
Issue 3	6 <sup>th</sup> June 2017	
Issue 4	12 <sup>th</sup> June 2017	
Issue 5	5 <sup>th</sup> October 2017	Reduced Dev. Size & Responding to Highway Authority Comments

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Ymgynghorwyr Priffyrdd a Thrafnidiaeth  
Highways & Transportation Consultants

## 1 Introduction

- 1.1 Acstro Ltd has been appointed to advise on highway and transportation issues associated with the proposed residential development of land to the east of Cowbridge Road, St. Athan, Vale of Glamorgan. The land is allocated for the development of circa 300 residential units in the Vale of Glamorgan Council's Deposit Local Development Plan under reference MG2(5).
- 1.2 Due to site constraints it has been established that the maximum number of units that can be accommodated on the site is 253 and outline planning permission is sought for this.
- 1.3 A site location plan is provided as Appendix 1.

### Appendix 1 Location

- 1.4 This Transport Assessment considers the accessibility of the site by all forms of transport, the likely trip generation of the development and other transport related issues associated with the development. The scope and content of this document has been influenced by discussions with Vale of Glamorgan Council Highway Officers and comments received from the Highway Authority during pre-application consultation.
- 1.5 This Transport Assessment considers the following:
  - Details of the existing site and its location;
  - Assessment of the site's accessibility by all modes of transport;
  - An outline of the proposed development;
  - Relevant transport planning policy;
  - Assessment of existing traffic flows near the site and anticipated trip generation of the proposed development during peak periods;
  - Impact of the proposed development on the local highway network, including servicing; and
  - Summary and conclusions.
- 1.6 This revision of the Transport Assessment has been produced to reflect the reduced scale of the development (253 units rather than 300 units) and in response to comments received from the Vale of Glamorgan Highway Authority, which are included as Appendix 1.

### Appendix 2 Highway Authority Consultation Response

## 2 Planning Policy Background

### National Planning Policy – Planning Policy Wales

- 2.1 Planning Policy Wales (PPW) sets out the land use planning policies of the Welsh Government.
- 2.2 In terms of transport related policies it places the sustainability of development at the heart of the decision making process (pp 4.7.4) and requires that new development proposals minimise the need to travel and increase accessibility by modes other than the private car. It requires that major generators of travel demand be located within existing urban areas that are well served by public transport, or can be reached by walking or cycling.
- 2.3 The principles discussed above are repeated again in PPW's Chapter 8, which deals specifically with Transport issues. In paragraph 8.1.4 it reinforces the Welsh Government's objectives for transport through:
- reducing the need to travel, especially by private car, by locating development where there is good access by public transport, walking and cycling;
  - locating development near other related uses to encourage multi-purpose trips and reduce the length of journeys;
  - improving accessibility by walking, cycling and public transport;
  - ensuring that transport is accessible to all, taking into account the needs of disabled and other less mobile people;
  - promoting walking and cycling;
  - supporting the provision of high quality public transport;
  - supporting traffic management measures;
  - promoting sustainable transport options for freight and commerce;
  - supporting sustainable travel options in rural areas;
  - supporting necessary infrastructure improvements; and
  - ensuring that, as far as possible, transport infrastructure does not contribute to land take, urban sprawl or neighbourhood severance.
- 2.4 In terms of plan making and development control PPW advises (8.7.1) that the following issues should be taken into account:
- the impacts of the proposed development on travel demand;
  - the level and nature of public transport provision;
  - accessibility by a range of different transport modes;
  - the willingness of a developer to promote travel by public transport, walking or cycling, or to provide infrastructure or measures to manage traffic
  - the environmental impact of both transport infrastructure and the traffic generated; and
  - the effects on the safety and convenience of other users.

- 2.5 PPW also requires that the proposed access to a development should reflect the likely travel patterns involved. It should ensure that people can reach the development, as far as practicable, by walking, cycling and public transport, as well as by car (pp 8.7.3).

### **National – Technical Advice Note 18, Transport (TAN18)**

- 2.6 Guidance on the assessment of transportation impacts relating to proposed developments is provided within TAN18.
- 2.7 TAN18 details the Welsh Government's policies in terms of transportation and repeats the general principles advocated in PPW i.e. that development is encouraged in sustainable, accessible, locations that will reduce the need to travel by car. Its aim is to promote an efficient and sustainable transport system and to counter the adverse impacts associated with road traffic growth, for example increased air pollution, green house gases and congestion (2.1). It sees the integration of transport and land use planning as key (2.3) in achieving the Welsh Governments' sustainable development policy objectives by:
- promoting travel efficient settlement patterns;
  - ensuring new development is located where there is good access by public transport, walking and cycling thereby minimizing the need for travel and fostering social inclusion;
  - managing parking provision;
  - ensuring that new development includes appropriate provision for pedestrians, cycling, public transport, and traffic management and parking/servicing;
  - encouraging the location of development near other related uses to encourage multi-purpose trips; and
  - ensuring that transport infrastructure necessary to serve new development allows existing transport networks to continue to perform their identified functions.
- 2.8 The needs of walkers and cyclists must be taken into consideration and the use of these most sustainable forms of transport encouraged in all developments (TAN18 Chapter 6). Similarly all development should be accessible by public transport (Chapter 7).

### **Local Planning Policy - Local Development Plan 2011 – 2026**

- 2.9 St. Athan is identified as one of three of the County's Strategic Opportunity Areas (SOA) within the Deposit Local Development Plan (LDP). SOA's offer the potential for development to take place in a sustainable way that will benefit the region as a whole. St. Athan also benefits from being designated part of the St. Athan – Cardiff Airport Enterprise Zone.
- 2.10 St. Athan is also identified as a Primary Settlement. Primary Settlements play an important role in meeting housing need and providing some key local services and facilities. They provide for the needs of residents and cater for the needs of the surrounding rural areas by providing key services and facilities for day-to-day needs.

- 2.11 Some of the identified LDP strategies for St. Athan (5.22) are to improve access to and within St. Athan through a range of transport measures to support and maintain economic development and to improve walking and cycling facilities within the settlement.
- 2.12 Policies SP7 and MG16 relate to the delivery of transport infrastructure projects, one of which being the St. Athan Northern Access Road (NAR). The NAR will link the B4265 at Boverton and the Llanmaes Traffic Signal Junction. It will improve links between St. Athan and Llantwit Major and incorporate improved walking and cycling facilities. The LDP states (6.97) that the NAR will provide real sustainable transport options for residents of St. Athan and assist school pupils to access the secondary school without the requirement for dedicated school transport and promote healthy and active lifestyles. Planning permission for the NAR was granted in September 2017.
- 2.13 Policy MG2 relates to housing allocations and identifies the application site MG2(5) as being capable of yielding circa 300 dwellings.

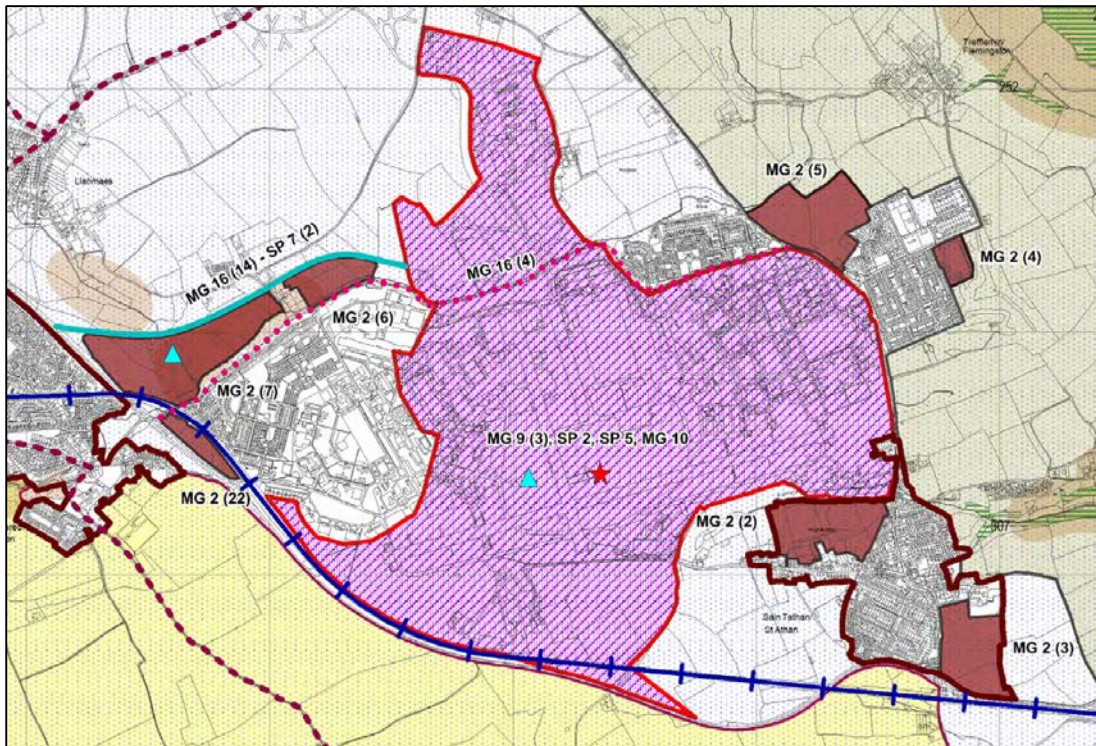


Figure 1 Extract from Deposit LDP Proposals Map

### 3 Existing Conditions

#### Location & Proximity to Services

3.1 The site is shown in context in Appendix 3.

#### Appendix 3 Site Context

- 3.2 The site is approximately 10.9 hectares in area and located on the north eastern edge of St. Athan. Its boundaries are formed to the south west by Cowbridge Road/St. Athan Road, to the south east by existing residential development and to the north by agricultural land.
- 3.3 On the opposite side of Cowbridge Road to the application site is the St. Athan Ministry of Defence site. At the north east corner of the MOD site and opposite the application site is a Spar convenience store.
- 3.4 The site is located approximately 1.5km to the north of the historic centre of St. Athan where there are a number of facilities including a pharmacy, barbers, hairdressers, two convenience stores, post office, public house, library, church and take-away.
- 3.5 St. Athan Primary School is located in Rock Road, some 1.6km from the application site.
- 3.6 A wider range of facilities, including secondary education, is provided in Llantwit Major. The centre of Llantwit Major is some 5km from the application site via existing routes but this distance will be shortened by the delivery of the proposed NAR.
- 3.7 Cowbridge is located approximately 6km north of the site and Barry lies some 13km to the east.

#### Pedestrian & Cycle Networks

3.8 Acceptable walking distances will vary considerably depending on various factors such as fitness and land topography; however, 'Providing for Journeys on Foot' guidelines by the Institution of Highways and Transportation (IHT) suggest the following walking distances shown in Table 1 for commuting / travelling to school or sight-seeing and elsewhere:

Destination	Desirable	Acceptable	Preferred Maximum
Commuting / School / Sight-seeing	500m (6 minutes)	1,000m (12 minutes)	2,000m (24 minutes)
Elsewhere	400m (5 minutes)	800m (10 minutes)	1,200m (14 minutes)
Shopping			1,000m (12 minutes)

**Table 1 Suggested Acceptable Walking Distance**

(Source: IHT Providing for Journeys on Foot')

3.9 Based on these recommendations it is considered that all of the facilities available within St. Athan are within reasonable walking distance to the application site.

- 3.10 There is a footway along the western side of Cowbridge Road that links the site to the village centre. The footway is on the opposite side of Cowbridge Road to the proposed development and therefore safe crossing facilities will need to be provided to link the two. The footway runs along a generously wide verge and the opportunity exists to improve and widen this path to create a shared cycle and footway and by doing so improve cycle links to the development site. Further details of the proposed improvement are provided later in this document.
- 3.11 There is a footway along the northern side of Eglwys Brewis Road that provides access to the nearest bus stops and will also provide access to the NAR and its improved links to Llantwit Major when this is delivered.
- 3.12 There is a public right of Way (PROW) that crosses the application site. The PROW will not be obstructed by the proposed development. It may be necessary to undertake minor diversions to the route of the PROW through the development site, subject to the appropriate statutory process, in order to accommodate the development layout.
- 3.13 The Department of Transport (DfT) Local Transport Note 2/08 Cycle Infrastructure Design (October 2008) suggests that a trip distance of over 5 miles (8km) is not uncommon.
- "1.5.1 Urban networks are primarily for local journeys. In common with other modes, many utility cycle journeys are under three miles (ECF, 1998), although, for commuter journeys, a trip distance of over five miles is not uncommon. Novice and occasional leisure cyclists will cycle longer distances where the cycle ride is the primary purpose of their journey. A round trip on a waymarked leisure route could easily involve distances of 20 to 30 miles. Experienced cyclists will often be prepared to cycle longer distances for whatever journey purpose."
- 3.14 Based on this advice it is feasible for journeys to all parts of St. Athan, Llantwit Major and Cowbridge to be made by bicycle.
- 3.15 It is considered that the relatively quiet streets within St Athan are suitable for cyclists. Cycle trips to and from Llantwit Major can be made along Eglwys Brewis Road thereby avoiding the busier B4265. In the future the proposed NAR will deliver improved cycle links between the two settlements. The topography around St. Athan and Llantwit Major is largely flat and presents no significant barrier to cycling trips.
- 3.16 Cycle trips to and from Cowbridge, along St. Athan Road would be more challenging in terms of distance and topography and would likely be considered only by more experienced cyclists. Even so the journey time of some 25 to 30 minutes by bike makes this journey feasible for commuter trips, for instance.
- 3.17 National Cycle Network (NCN) Route 88 crosses St. Athan Road approximately 2km north of the application site. This route is in the process of being completed and will eventually link Newport, Cardiff, Barry, Bridgend and Margam Park. There is a spur to NCN Route 88 at Llanmaes (NCN Route 888) that provides a short-cut and re-joins Route 88 near Ewenny.



### Public Transport Network

- 3.18 The nearest bus stops to the site are located at Pinewood Square on Eglwys Brewis Road. They are some 350m from the application site. There are also the East Camp bus stops located on Cowbridge Road, some 300m south of the site. The same bus services call at both Pinewood Square and East Camp stops.
- 3.19 46 buses leave from these stops per day, Monday to Friday, with 23 on Saturday and 9 on Sunday. Listed below are the different bus services available from these stops and timetables for the public service routes are provided as Appendix 4.

#### Appendix 4 Bus Timetables

X91	Cardiff - Llantwit Major (Bus Station)
X45	Barry – Llantwit Major
303/304	Barry (Highlight Park) - Llantwit Major (Bus Station)
303/304	Barry - Bridgend (Bus Station)
905	Cardiff Airport - Rhoose
P351	(School Bus) Eglwys Brewis - St Athan
S40	(School Bus) St Athan - Llantwit Major Comprehensive School
S52	Wick - St Richard Gwyn High School, Barry

- 3.20 Llantwit Major railway station is located some 5km from the application site. On Mondays to Saturdays there is an hourly service westbound to Bridgend and hourly service eastbound to Cardiff. On Sundays services in each direction run once every 2 hours.

### Highway Network

- 3.21 The application site's south-eastern boundary runs along Cowbridge Road. Cowbridge Road becomes St Athan Road to the north of the junction with Eglwys Brewis Road. To the north of the junction there is a speed limit transition with St Athan Road being subject to a 40 mph limit and Cowbridge Road and Eglwys Brewis Road subject to a 30 mph limit.
- 3.22 Cowbridge Road is a 2-way single carriageway road with central road markings. There is a footway running alongside its western side only.
- 3.23 The Eglwys Brewis Road / Cowbridge Road junction takes the form of a forked T-junction where traffic turning to and from the minor road can choose to use the carriageway on either side of a triangular grassed island. The junction arrangement is unsatisfactory as it generates many possible conflicting vehicle movements and this has the potential to confuse drivers. For example, drivers approaching the junction have no way of anticipating which side of the triangular island other vehicles will use. The Highway Authority has identified that improvements to this junction are required as part of the development of the application site.



**Figure 2 Cowbridge Road / Eglwys Brewis Road Junction**

- 3.24 A 7-day automatic traffic survey was undertaken on Cowbridge Road, adjacent to the site and to the south of the Eglwys Brewis Road junction, starting 8<sup>th</sup> September 2016. This recorded traffic speed and volume over the course of a week. Full details are included as Appendix 5 and summarized below.

**Appendix 5 Cowbridge Road Traffic Survey**

	<b>Northbound</b>	<b>Southbound</b>	<b>Two-Way</b>
Average Weekday Daily Traffic Volume	1,888	1,855	3,743
am Peak Hour Volume (0800-0900)	184	153	337
pm Peak Hour Volume (1700-1800)	160	156	316
Average Speed	34mph	34mph	34mph
85 <sup>th</sup> Percentile Speed	39mph	36mph	38mph

**Table 2 Cowbridge Road Traffic Volume & Speed**

- 3.25 The survey shows that traffic volume on Cowbridge Road is relatively light with the recorded 316 to 337 peak hour vehicle movements being well within the theoretical capacity of a highway. The peak hour flows are fairly evenly balanced with a similar volume of traffic travelling in each direction.
- 3.26 Traffic speeds are a little high with average speeds exceeding the 30mph speed limit and an 85<sup>th</sup> percentile northbound speed of 39mph. In order to encourage walking and cycling and provide a safer environment for vulnerable road users it is considered appropriate to introduce speed-reducing features as part of the development.

- 3.27 Continuing south, Cowbridge Road passes through the centre of St Athan and becomes Gileston Road, meeting the B4265 at a crossroad junction. The B4265 leads to Llantwit Major to the west and Barry to the east.
- 3.28 Peak Hour turning count surveys were also undertaken on 8<sup>th</sup> September 2016 at the Cowbridge Road / Eglwys Brewis Road junction and the Gileston Road / B4265 junction. The survey results are presented in full as Appendix 6 and summarized below.

#### Appendix 6 Junction Peak Hour Surveys

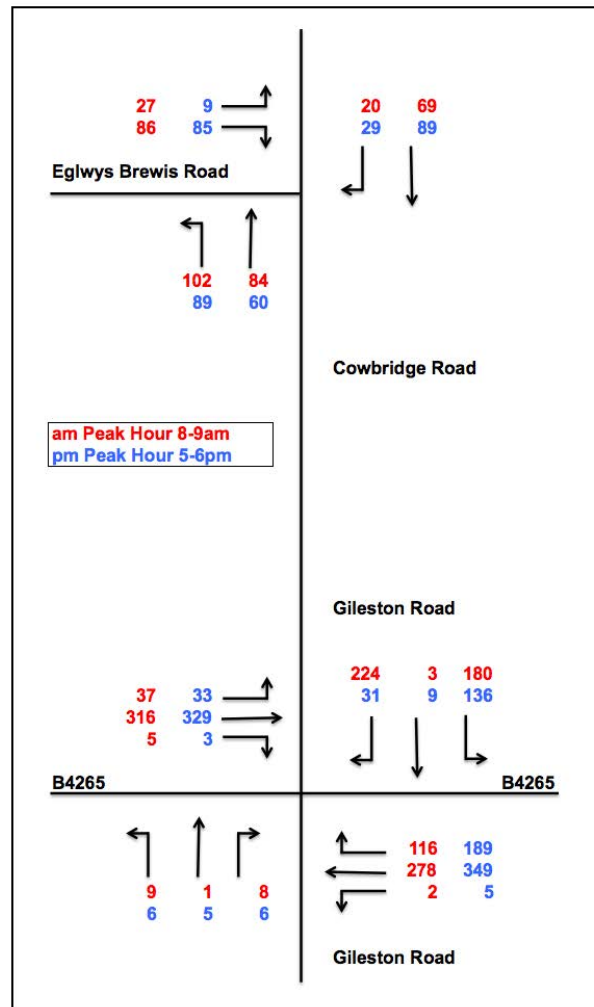
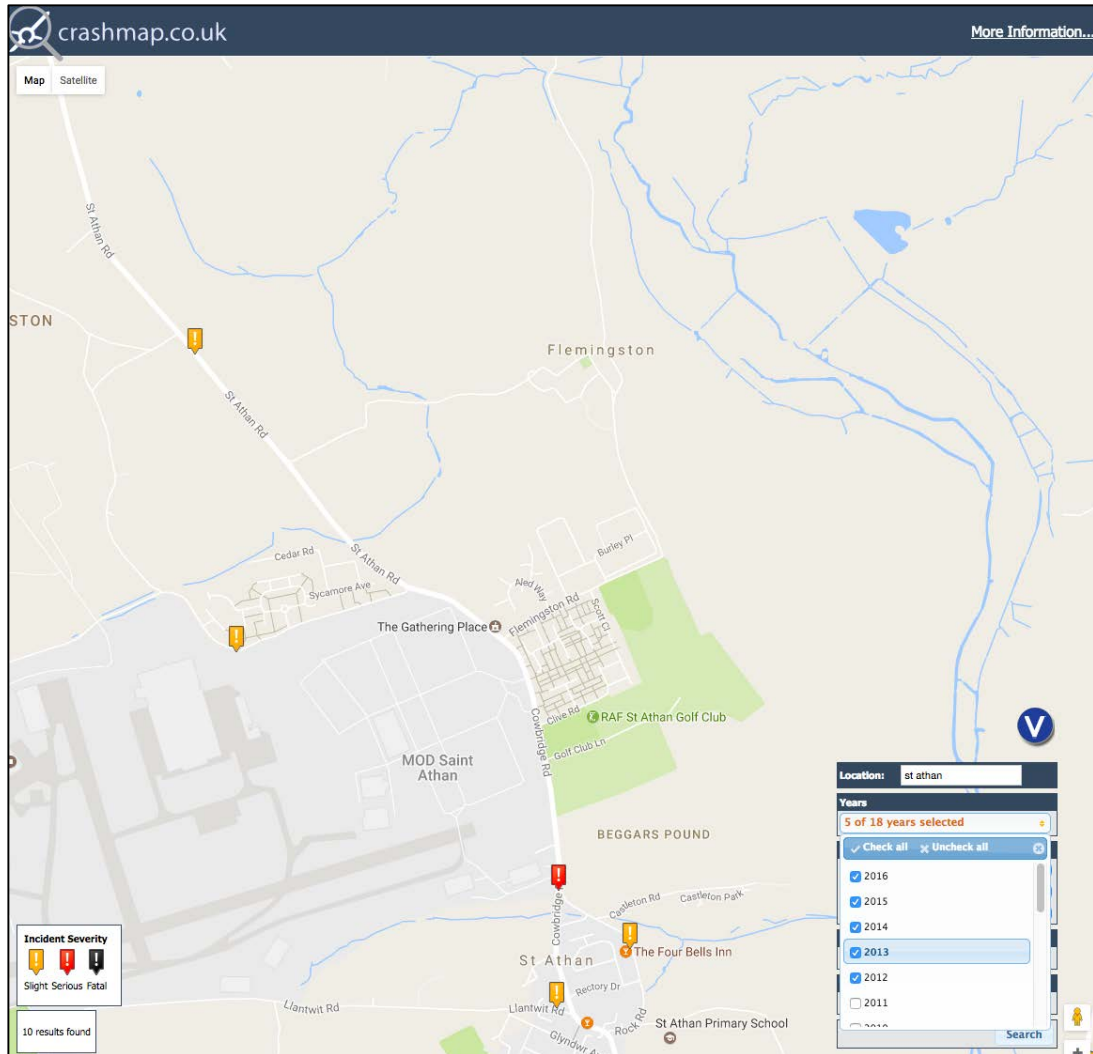


Figure 3 Observed Peak Hour Traffic

- 3.29 A review of the safety of the streets and roads near the site has been undertaken by reference to the area's personal injury accident history. The figure below shows the location and severity of all recorded injury accidents over the latest five-year period for which data is available (2012 to 2016 inclusive).
- 3.30 There are no recorded injury accidents adjacent to the site on Cowbridge Road and the St Athan Road / Cowbridge Road / Eglwys Brewis Road junction.

- 3.31 There is one slight severity accident recorded on Eglwys Brewis Road and one on St Athan Road, some 600m west and 900m north of the application site respectively. These are evidently isolated incidents. The absence of clusters of accidents suggest that the highway network operates adequately from a safety perspective.



**Figure 4 Injury Accident Location & Severity**

## 4 Proposed Development

- 4.1 The proposed development will comprise of up to 253 dwellings. An illustrative master plan is provided as Appendix 8.

### Appendix 7 Illustrative Masterplan

#### Access & Off-Site Works

- 4.2 It is proposed that the site be provided by two vehicular accesses. The proposed access arrangement is shown in Appendix 8.

### Appendix 8 Proposed Access Arrangement

- 4.3 The site's primary access will be formed by creating a roundabout at the Eglwys Brewis Road / St Athan Road / Cowbridge Road junction. As well as forming the main access to the site the introduction of a roundabout at this location provides additional benefits in terms of traffic flow. The roundabout will reduce conflict associated with the existing right-turns to and from Eglwys Brewis Road and improve safety in that regard. The roundabout will also create a gateway feature that slows traffic travelling along St Athan Road / Cowbridge Road. The existing transition in speed limit from 40mph to 30mph, which is currently located a short distance to the west of the Eglwys Brewis Road junction will be relocated further to the west so that the development site's frontage is within the 30mph speed limit area.
- 4.4 A secondary priority junction access is proposed from Cowbridge Road to the south of the primary access at the south western corner of the site. The access will provide a 5.5m wide carriageways into the site. Visibility from the new junction is excellent with over 90m Y-distance available (from a X-distance of 2.4m).
- 4.5 The two proposed accesses also provide pedestrian access to the development with 2m wide footways provided adjacent to each.
- 4.6 A capacity assessment of the two proposed accesses is provided in chapter 5.
- 4.7 A 3.5m wide shared cycle/footway will be provided along the site's frontage between the two accesses. A crossing facility will be provided to link the development to the existing footway that run along the western side of Cowbridge Road. There is potential to extend the shared cycle/footway south of the site, past the Community Centre and to the junction of Flemmingston Road. This is dependent on the required land being adopted as public highway by the Highway Authority. If the land does become available the shared cycle/footway would require localized narrowing to 2.5m in order to pass the existing Community Centre car park. A width of 2.5m is acceptable and conforms with the minimum requirement for shared cycle/footways according to Welsh Government's 'Design Guide – Active Travel (Wales) Act 2013.
- 4.8 To the north west of the development's primary access the 3.5m wide shared cycle/footway will continue parallel to St Athan Road as an informal graveled surfaced path reflecting the rural nature of this section of highway.
- 4.9 The proposed highway works has been subject to an independent Stage 1 Road Safety Audit (RSA) which is included as Appendix 9.

### Appendix 9 Stage 1 RSA

- 4.10 The Highways Authority has requested that the development upgrades an existing Zebra crossing, located to the south of the site, near the RAF camp entrance, to a signal controlled crossing. The applicant has agreed to undertake this improvement or fund the improvement by way of a suitable financial contribution.

### Traffic Generation

- 4.11 The likely traffic generation of the proposed development has been estimated by reference to the TRICS trip rate database. TRICS is the UK and Ireland's national system of trip generation analysis, containing over 7150 directional transport surveys at over 110 types of development.

- 4.12 The following filtering criteria have been applied to arrive at a sample of surveyed sites that are considered to be representative of the proposed development:

Land Use:	Residential; Privately Owned Homes
Development Size:	150 – 450 dwellings
Regions:	England (excluding Greater London), Scotland & Wales
Locations:	Suburban Area or Edge of Town

- 4.13 The resultant TRICS output is provided as Appendix 10 and the typical hourly trip rate per dwelling and trip generation of the proposed 253 dwellings is summarized below.

#### Appendix 10 TRICS Trip Rate Data

Time Range	Trip Rate per Dwelling			Trip Generation 253 Dwellings		
	Arrivals	Departures	Total	Arrivals	Departures	Total
07:00-08:00	0.064	0.256	0.32	16	65	81
08:00-09:00	0.104	0.371	0.475	26	94	120
09:00-10:00	0.121	0.144	0.265	31	36	67
10:00-11:00	0.121	0.16	0.281	31	40	71
11:00-12:00	0.116	0.126	0.242	29	32	61
12:00-13:00	0.171	0.145	0.316	43	37	80
13:00-14:00	0.152	0.153	0.305	38	39	77
14:00-15:00	0.17	0.194	0.364	43	49	92
15:00-16:00	0.306	0.213	0.519	77	54	131
16:00-17:00	0.306	0.188	0.494	77	48	125
17:00-18:00	0.312	0.199	0.511	79	50	129
18:00-19:00	0.254	0.185	0.439	64	47	111
Daily	2.197	2.334	4.531	556	591	1146

**Table 3 Development Trip Generation**

- 4.14 The data suggests that the proposed 253 dwellings will generate some 1146 daily vehicle movements with 120 movements occurring during the morning peak hour and 129 during the evening peak hour.

- 4.15 An assessment of the distribution of development generated traffic has been undertaken by undertaking a review of 2011 Census data to establish the place of work of people that are usually resident of St Athan and an online route planner used to establish the most likely routes that residents of the development would use to reach those places of work. From the proposed development residents can travel:
- North along Cowbridge Road to Cowbridge and the A48. This provides the shortest and quickest route to Cardiff, Bridgend and destinations accessed via the M4. The Census data suggests that 47% of traffic will travel to and from this direction.
  - West along Eglwys Brewis Road to Llantwit Major. The Census data suggests that 8% of traffic will travel to and from this direction. Eglwys Brewis Road and the proposed NAR provides a shorter and more direct route to Llantwit Major than the alternative of travelling south through St Athan and then west along the B4265.
  - South/East through St Athan and east along the B4265 to Rhoose, Barry and Penarth. The Census data suggests that 46% of traffic will travel to and from this direction.
- 4.16 The traffic distribution described above was presented to the Highway Authority who considered that traffic travelling to Cardiff and Bridgend would be more likely to travel via the B4265 rather than via Cowbridge Road and the A48. The Highway Authority requested that the following traffic distribution be applied.
- 30% to/from Cowbridge Road to the north;
  - 10% to/from Eglwys Brewis Road to the west; and
  - 60% to/from St Athan Road (through the village) to the south.
- 4.17 Whilst the internal layout of the development is a reserved matter and not known at this stage it is assumed, for the purpose of this assessment, that 10% of the development will be served from the secondary access and 90% from the primary access. The resultant distribution of development traffic is shown in the figures below.

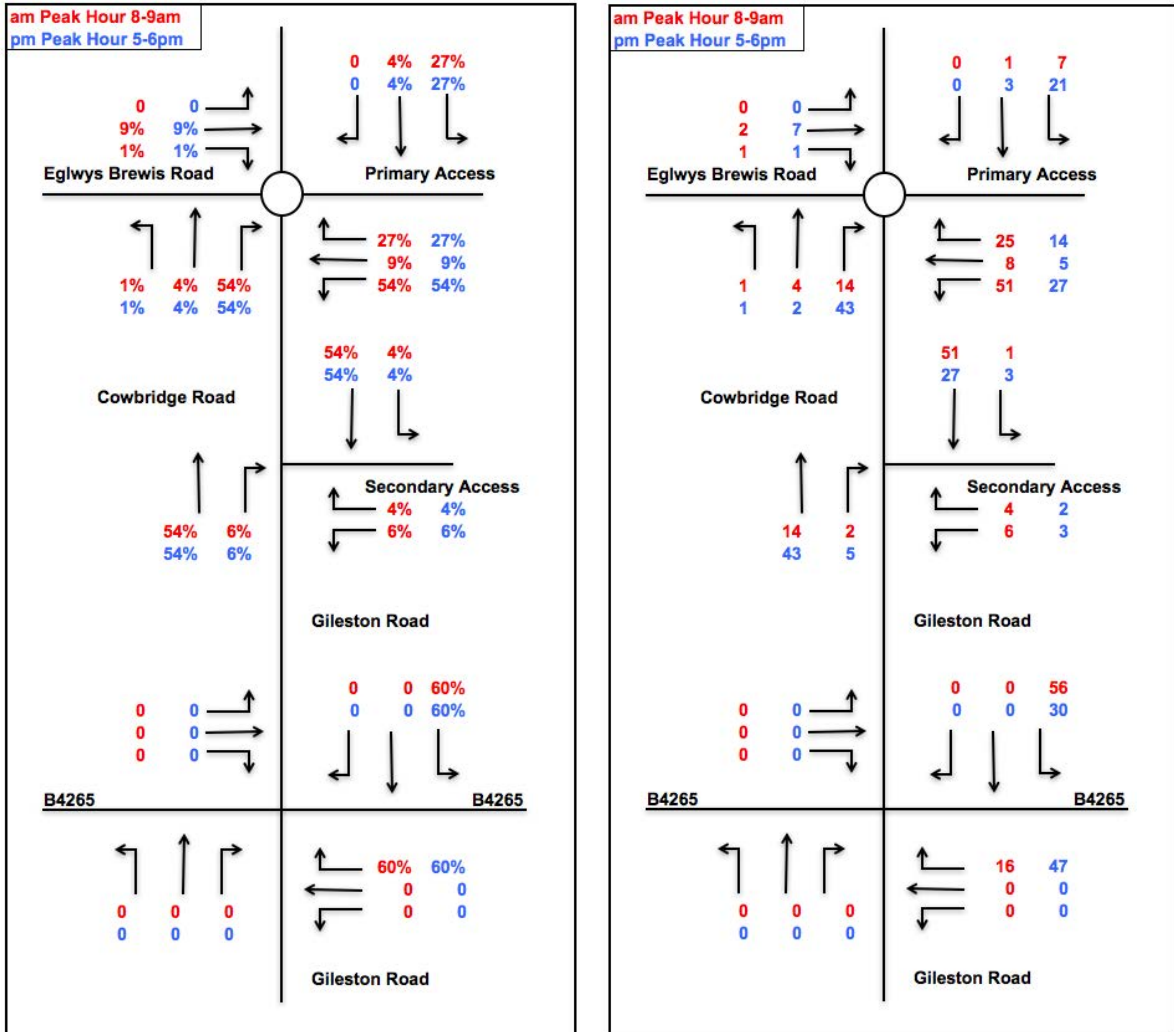


Figure 5 Development Traffic Distribution



## 5 Impact Assessment

- 5.1 Analysis of the capacity of the proposed development's accesses and the impact of the development's traffic on the Gileston Road / B4265 junction and Cowbridge Road / Eglwys Brewis Road junctions have been undertaken using the industry standard PICADY software package.
- 5.2 The assessment is based on predicted traffic conditions in 2027, ten years from the date of this planning application, when it is reasonable to expect that the development will be complete and fully occupied.
- 5.3 A locally adjusted growth factor (1.14) has been obtained from the DfT's Tempro software package in order that the 2017 observed traffic flow can be adjusted to reflect 2027 conditions.

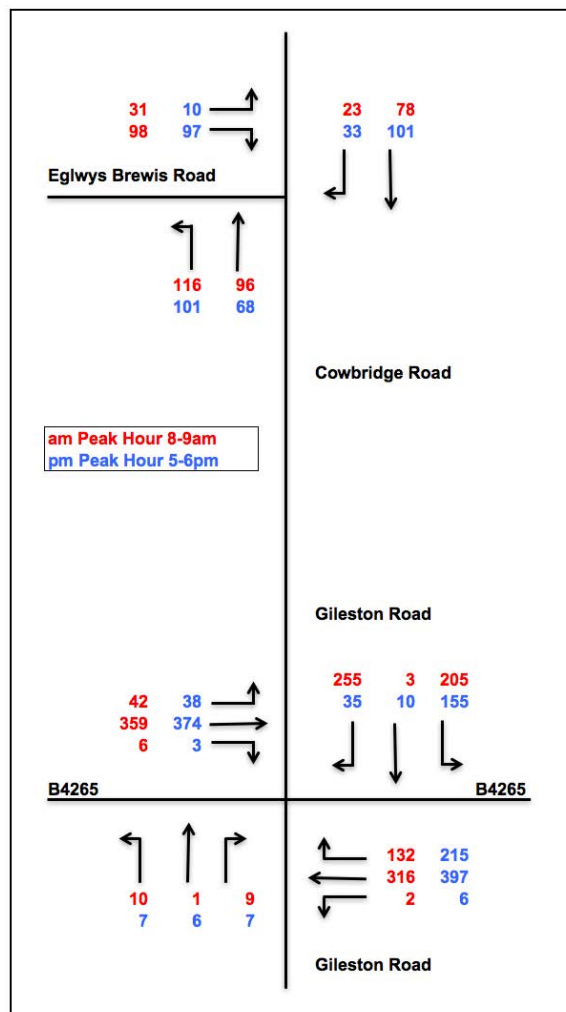


Figure 6 Observed Peak Hour Traffic Factored to 2027

### Committed Development

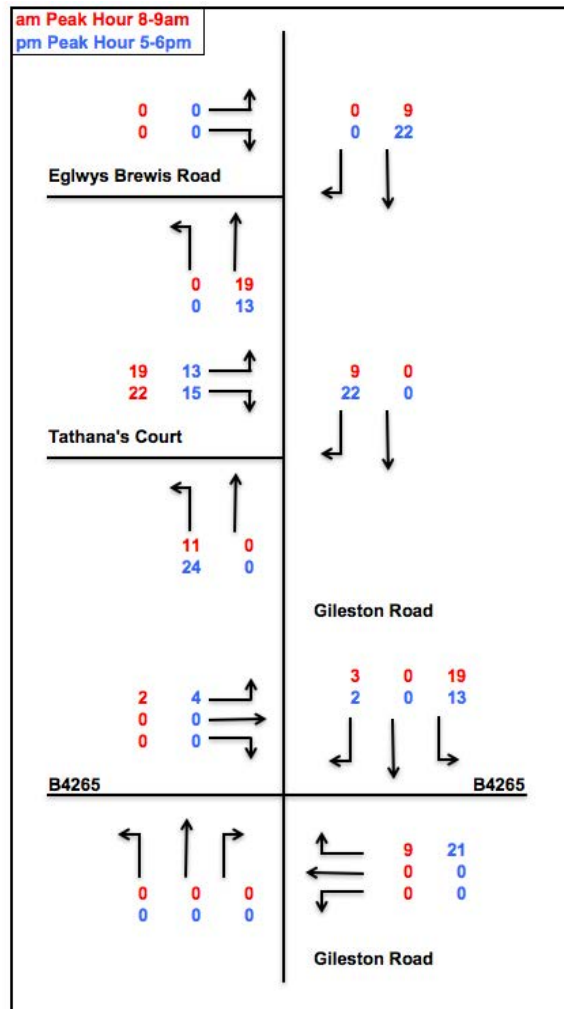
- 5.4 In September 2017 planning permission was granted for the construction of the NAR. It is understood that the program for the project assumes that the road will be open in August 2019.

5.5 A development of 100 dwellings is currently under construction at Tathana's Court. A review of the Transport Assessment that accompanied the planning application reveals that the expected traffic generation of the development is as follows:

	Arrivals	Departures	Total
am Peak Hour	20	41	61
pm Peak Hour	46	28	74

**Table 4 Predicted Tathana's Court Development Traffic Generation**

5.6 If the same distribution of trips is applied to these as was discussed in the previous section the committed development's traffic flow would be as shown in the figure below.



**Figure 7 Committed Development Traffic**

5.7 Adding the committed development traffic 2027 traffic estimate provides the 2027 baseline against which the development proposals must be considered.

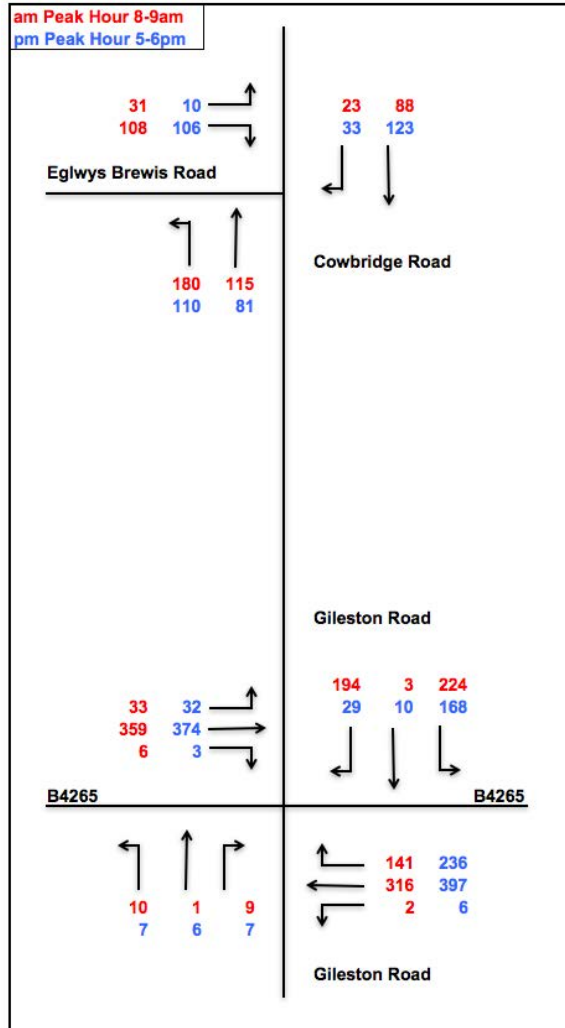


Figure 8 2027 Baseline Traffic

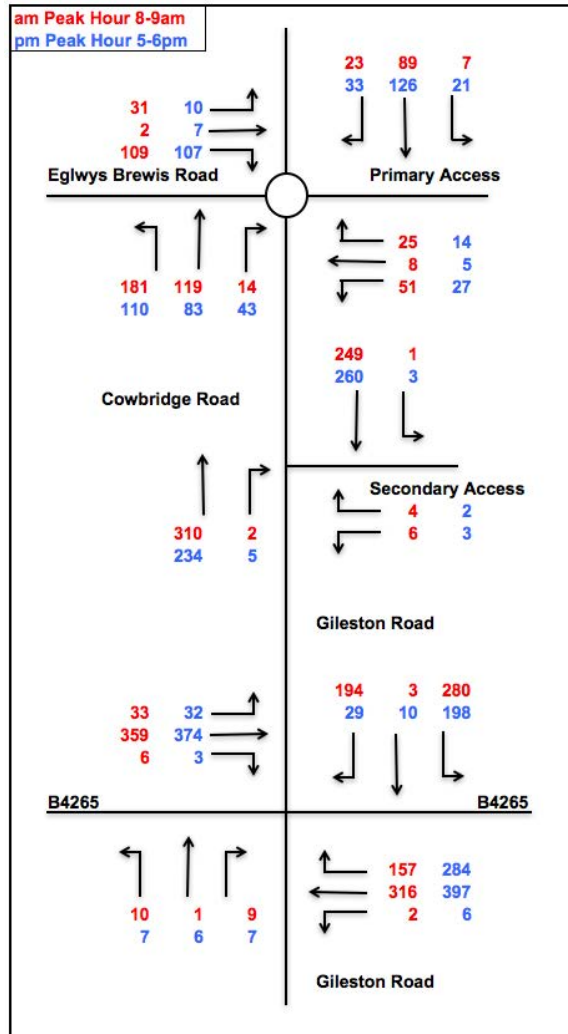


Figure 9 2027 Baseline + Development Traffic

### Primary Site Access

- 5.8 The capacity of the primary site access roundabout has been tested using the ARCADY software, which also quantifies the RFC of the various arms of the junction. The results are included in full as Appendix 11 and summarized below.

#### **Appendix 11 Primary Site Access Capacity Analysis**

- 5.9 The analysis shows that the new roundabout has ample spare capacity with a maximum RFC of 0.31.

	AM				PM			
	Queue (Veh)	Delay (min)	RFC	LOS	Queue (Veh)	Delay (min)	RFC	LOS
<b>Proposed Roundabout - Design 2027</b>								
<b>Site Access</b>	0.11	0.07	0.10	A	0.06	0.07	0.06	A
<b>Cowbridge Road</b>	0.45	0.08	0.31	A	0.30	0.07	0.23	A
<b>Eglwys Brewis Road</b>	0.25	0.09	0.20	A	0.20	0.09	0.17	A
<b>St Athan Road</b>	0.13	0.06	0.12	A	0.22	0.07	0.18	A

**Table 5 Primary Site Access Junction Analysis**

### Secondary Site Access

- 5.10 The capacity of the secondary site access junction has been tested using the PICADY software. PICADY quantifies the ratio of flow against capacity (RFC) of a junction. A value below 1 indicates that the junction is operating within its capacity and a RFC greater than 1 suggests that traffic demand is exceeding the junction's capacity. A junction will begin to experience congestion when the RFC reaches around 0.85.

- 5.11 The results are included in full as Appendix 12 and summarized below.

#### **Appendix 12 Secondary Site Access Capacity Analysis**

	AM Peak Hour RFC	PM Peak Hour RFC
Cowbridge Road to Site Access	0.026	0.014
Site Access to Cowbridge Road	0.006	0.013

**Table 6 Secondary Site Access Junction Analysis**

### B4265 / Gileston Road

- 5.12 An assessment of the operation of the B4265 / Gileston Road junction has been undertaken using the industry standard PICADY software.

- 5.13 The detailed output of the PICADY analysis is provided as Appendix 13 and summarized below.

#### **Appendix 13 B4265 / Gileston Road Capacity Analysis**

	AM Peak Hour RFC			PM Peak Hour RFC		
	Observed	2027 Baseline	2027 + Development	Observed	2027 Baseline	2027 + Development
B4265 (E)	0.225	0.278	0.310	0.367	0.467	0.562
Gileston Road (S)	0.053	0.063	0.066	0.051	0.064	0.067
B4265 (W)	0.010	0.012	0.013	0.007	0.007	0.007
Gileston Road (N)	0.978	1.020	1.134	0.374	0.448	0.513

**Table 7 B4265 / Gileston Road Junction Analysis**

- 5.14 The junction operates within capacity under all the tested scenarios during the evening peak.
- 5.15 The results of the analysis suggest that the junction is already reaching its capacity on the Gileston Road (N) arm from the village during the morning peak hour. Currently a RFC of 0.978 occurs during the morning peak hour. The issue at this arm of the junction is that once traffic waiting to turn right onto the B4265 (towards Llantwit Major) causes a short queue traffic wanting to turn left (towards Rhoose) cannot advance to the give-way line.
- 5.16 With the addition of general traffic growth between 2017 and 2027 and committed development the RFC is predicted to increase to 1.02 and the proposed development traffic will increase this further to 1.134.
- 5.17 This assessment of course assumes that the distribution of traffic at the junction remains constant until the assessment year and that drivers will not adapt their behavior as conditions at the junction change. This is too simplistic as in reality drivers will adapt their behavior as delays increase at a junction; for example choosing to travel earlier or later to avoid the peak time, changing their route to avoid the junction or changing their mode of travel.
- 5.18 In this case it is reasonable to assume that some drivers currently turning right towards Llantwit Major will choose to avoid the junction by using the Eglwys Brewis Road route instead. This change in westbound route is likely to be amplified with the delivery of the St Athan NAR. As traffic is reassigned onto Eglwys Brewis Road / the NAR conditions will improve at the Gileston Road / B4265 junction. Similarly trips to some destinations to the east may divert northwards along St Athan Road to the A48.
- 5.19 The delivery of the NAR will also encourage a modal shift from car to active travel modes for trips to and from Llantwit Major and by doing so will reduce traffic demand at the Gilestone Road / B4265 junction.
- 5.20 Nevertheless the Highway Authority has requested that mitigation measures be considered that would increase the capacity of the junction sufficiently that the proposed development has no impact on its operation even if there is no re-assignment of trips. This has been investigated and can be achieved by modest widening and flaring of Gileston Road's northern approach to the junction. The widening of the junction approach increases the junction's capacity by making it easier for left-turning traffic to pass traffic that's waiting to turn right. The necessary works are shown in Appendix 14 together with the results of the PICADY analysis, which is summarized in the table below.

## Appendix 14 B4265 / Gileston Road Mitigation Measures

	AM Peak Hour RFC			PM Peak Hour RFC		
	2027 Baseline	2027 + Development (Existing Junction)	2027 + Development (With Mitigation Measures)	2027 Baseline	2027 + Development (Existing Junction)	2027 + Development (With Mitigation Measures)
B4265 (E)	0.278	0.310	0.310	0.467	0.562	0.562
Gileston Road (S)	0.063	0.066	0.065	0.064	0.067	0.067
B4265 (W)	0.012	0.013	0.013	0.007	0.007	0.007
Gileston Road (N)	1.020	1.134	1.019	0.448	0.513	0.381

Table 8 B4265 / Gileston Road Junction Analysis With &amp; Without Mitigation

## 6 Conclusion

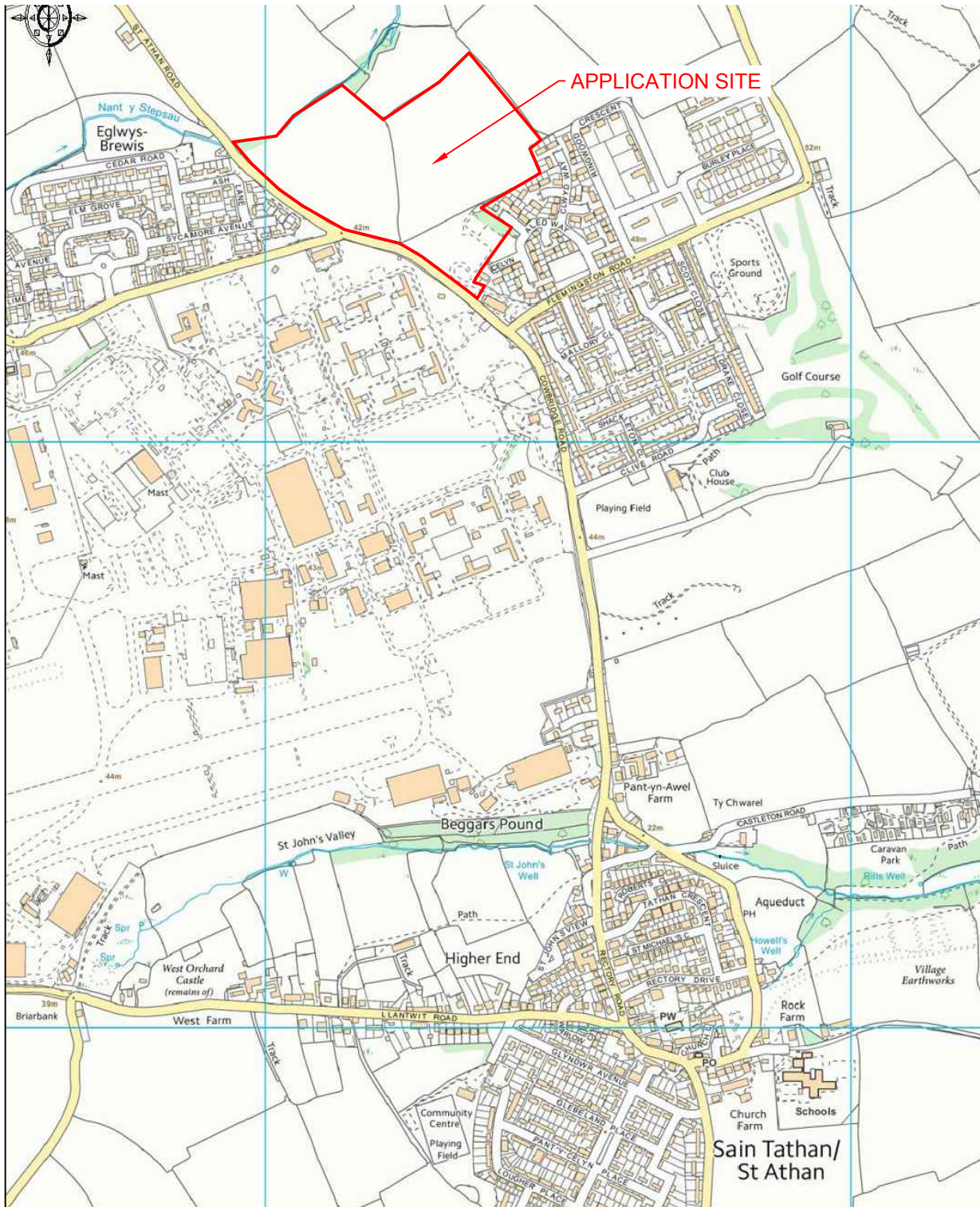
- 6.1 The application site is allocated for residential development of up to 253 dwellings within the deposit LDP. The site is in a sustainable and accessible location where residents of the development will not be reliant on the car and can access day-to-day facilities on foot, by bicycle or by public transport. Safe means of access can be provided and it is considered that the development's traffic can be accommodated on the surrounding highway network. Consequently it is considered that the proposal is acceptable in highway and transportation terms.




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# Appendix 1



A	First Issue	29-09-16
 Prifffydd a Thrafnidiaeth Highways & Transportation Ty Penbryn, Salem, Llandello.SA19 7LT E-mail: mail@acstro.com www.acstro.com Tel: 01558 824021		
<b>COWBRIDGE ROAD ST ATHAN</b>		
<b>LOCATION PLAN</b>		
0991	101	A
	NTS	@ A4

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# Appendix 2



## Vale of Glamorgan Highway Authority Observation Sheet

Planning Application Ref:	2016/01427/OUT
Observations By:	Paul D Harrison
Date:	25 August 2017
Location:	Land off Cowbridge Road, St Athan
Proposal:	Residential development of up to 300 units and associated work, including the provision of public open space and strategic access points
Case Officer:	Mr. Steven Rennie

Further to reviewing the amended Transport Assessment (TA) and associated plans in relation to the above, the following comments are provided.

1. The TA has undertaken a review of development traffic distribution based on travel to work Census Data. However, it appears that the percentage of development traffic to and from the north (via Cowbridge Road) is higher than expected and it is not realistic to assume traffic travelling to Cardiff and Bridgend will use this route (this is a single-track country lane and not an attractive alternative). As a result, it is considered that a significant proportion of development traffic would likely travel to and from Cardiff and Bridgend via the B4265.

Therefore, a comparative assessment of the junction of Gilestone Road/B4265 is required to be undertaken based on the following distribution.

- 30% to/from Cowbridge Road to the north;
- 10% to/from Eglwys Brewis Road to the west; and
- 60% to/from St Athan Road (through the village) to the south.

Notwithstanding the above, it is noted that the analysis within the TA identifies that the junction will be over capacity during the AM peak period in 2027, with and without development traffic. The TA assumes that there will be a change in driver behaviour relating to the choice of routes to destinations and as a result, mitigation is proposed by way of a financial contribution towards sustainable transport. However, as changes in driver behaviour etc. cannot be relied upon,

improvements to the junction are required to be identified in order to achieve nil detriment.

2. The submitted drawings showing the proposed roundabout that will provide primary access to the site are required to identify and show the full design criteria in accordance with Design Manual for Roads and Bridges. In addition, a Stage 1/2 Road Safety Audit is required to be undertaken of the design by a suitably qualified auditor, who shall first be approved by the LHA.
3. The pedestrian crossing facilities at the proposed roundabout are required to be incorporated within the splitter islands along each arm.
4. It appears that the existing access at the junction of Eglwys Brewis Road and Cowbridge Road that serves adjacent MOD land, will be stopped up, in order to facilitate the the primary access to the site. However, this is required to be confirmed (with associated permissions/correspondence submitted) and clearly shown on the submitted plans.
5. The submitted swept paths are unclear and do not consider all traffic movements associated with the proposed roundabout. As a result, the swept paths are required to be resubmitted to a scale of 1/250 and show all turning movements. In addition, swept paths of a 11.22m refuse vehicle, entering and exiting the secondary site access are required to be provided.
6. The X distance associated with the visibility splays from the secondary means of access along Cowbridge Road is required to be provided at 4.5m. This is based on the requirements of LTN 2/08 – Cycle infrastructure Design, as a cycle/footway will cross the site access.
7. The proposed cycle/footway along the site frontage is required to be located adjacent to the carriageway. Furthermore, the cycle/footway to the northwest of the primary site access is required to be formally constructed from tarmacadam and not as a gravel surface. The footways along the site frontage are required to be shown as illuminated.
8. The existing pedestrian footway along northern side Eglwys Brewis Road, adjacent to the junction of Cowbridge Road, is required to be extended around the junction for a distance of approximately 40.0m and include pedestrian crossing points.
9. The location of the existing 30/40mph speed limit transition adjacent to the site is required to be shown on the submitted drawings. In addition, the relocated speed limit transition is required to be constructed as a gateway feature (including carriageway markings and surface dressing) with associated forward visibility shown on the submitted plans.

10. The internal residential access roads within the site are not acceptable as shown and are required to be designed for a maximum speed of 20 mph without the use of any vertical deflections.

**Note:** Further comments will be provided in relation to the extension of the propose cycle/footway across the frontage of the adjacent community centre and the upgrading of the adjacent zebra crossing to the southeast of the site in due course.

## Vale of Glamorgan Highway Authority Observation Sheet

Planning Application Ref:	2016/01427/OUT
Observations By:	Paul D Harrison
Date:	16 January 2017
Location:	Land off Cowbridge Road, St Athan
Proposal:	Residential development of up to 300 units and associated work, including the provision of public open space and strategic access points
Case Officer:	Mr. Steven Rennie

Further to reviewing the above, the submitted Transport Assessment (TA) and associated plans are required to be amended and resubmitted taking account of the following.

1. The proposed site layout and access arrangements are required to be provided on an engineering plan to a suitable scale (1/200), showing all engineering details and dimensions associated with cycleways, footways, dropped kerbs, tactile paving, carriageways, shared surfaces, junction radii, visibility splays (including forward visibility) and associated car parking spaces etc.
2. A single point of access is required to be provided from the adjacent highway into the main aspect of the site. As a result, the applicant is required to investigate the provision of a roundabout junction with St Athan Road/Eglwys Brewis Road/Cowbridge Road, with access provided to the site at this location.

If it is demonstrated that a roundabout junction cannot be provided, the access will be required to be formed as a priority ghost island T-junction. In addition visibility from the access will be required to be provided based on the recorded speeds along the adjacent highway.

3. The proposed combined cycleway/footway along the southern site of Cowbridge Road is required to be provided at 3.5m and not 3.0m as stated within the TA.
4. A combined cycle/footway (3.5m wide) is required to be provided along the northern side of Cowbridge Road across the complete frontage of the site, connecting to Flemingston Road.

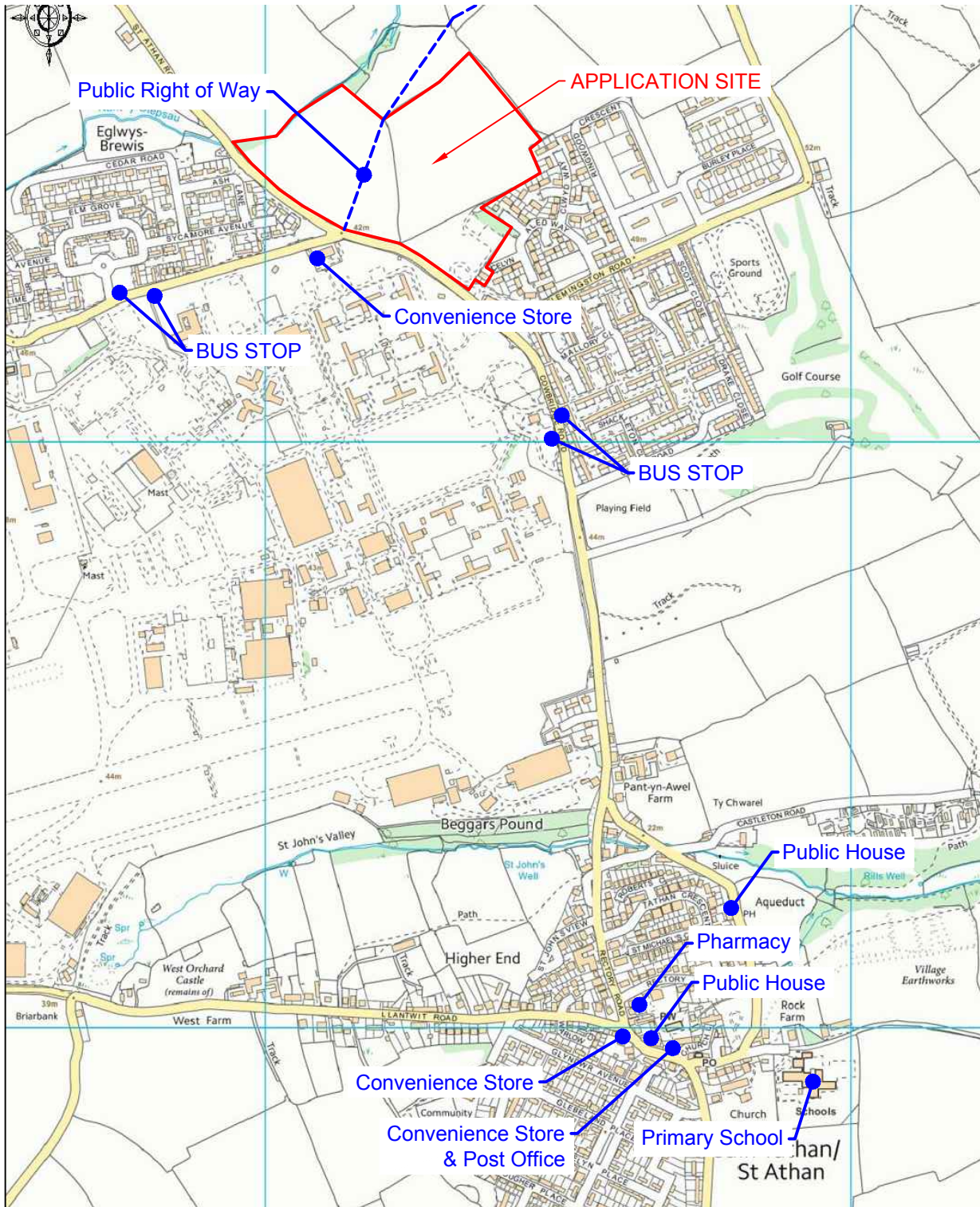
5. Details of the proposed speed reducing features and pedestrian crossing facilities as mentioned within the TA are required to be provided and shown on plan.
6. The existing zebra crossing to the southeast of the site, adjacent to the exit of RAF base, is required to be replaced with a Toucan Crossing.
7. The existing 30/40mph speed limit transition adjacent to the site is required to be relocated approximately 250m northwest of its current location along St Athan Road and constructed as a gateway feature, with associated forward visibility shown on the submitted plans.
8. An assessment of road traffic accidents along the adjacent highway network is required to be undertaken within the TA for the most recent 5 year period, which shall be based on STATS 19 accident data. The assessment will be required to be undertaken for a distance of 500m from the site along St Athan Road and Eglwys Brewis Road and along Cowbridge Road (through St Athan Village), between the junctions of the B4265 and Eglwys Brewis Road.
9. A comparative assessment of the distribution of development trips along the adjacent highway network is required to be undertaken within the TA based on travel to work Census data.
10. A capacity analysis of the junctions of Eglwys Brewis Road/Cowbridge Road (pre and post improvements) Gilestone Road/B4265 and Cowbridge Road/site access is required to be undertaken using the appropriate modelling software.
11. Swept paths of a 11.22m refuse vehicle showing all turning movements in/out and within the site are required to be submitted for consideration.
12. Pedestrian and cycle permeability is required to be increase with the provision of additional links to and within the site.



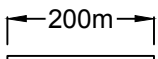
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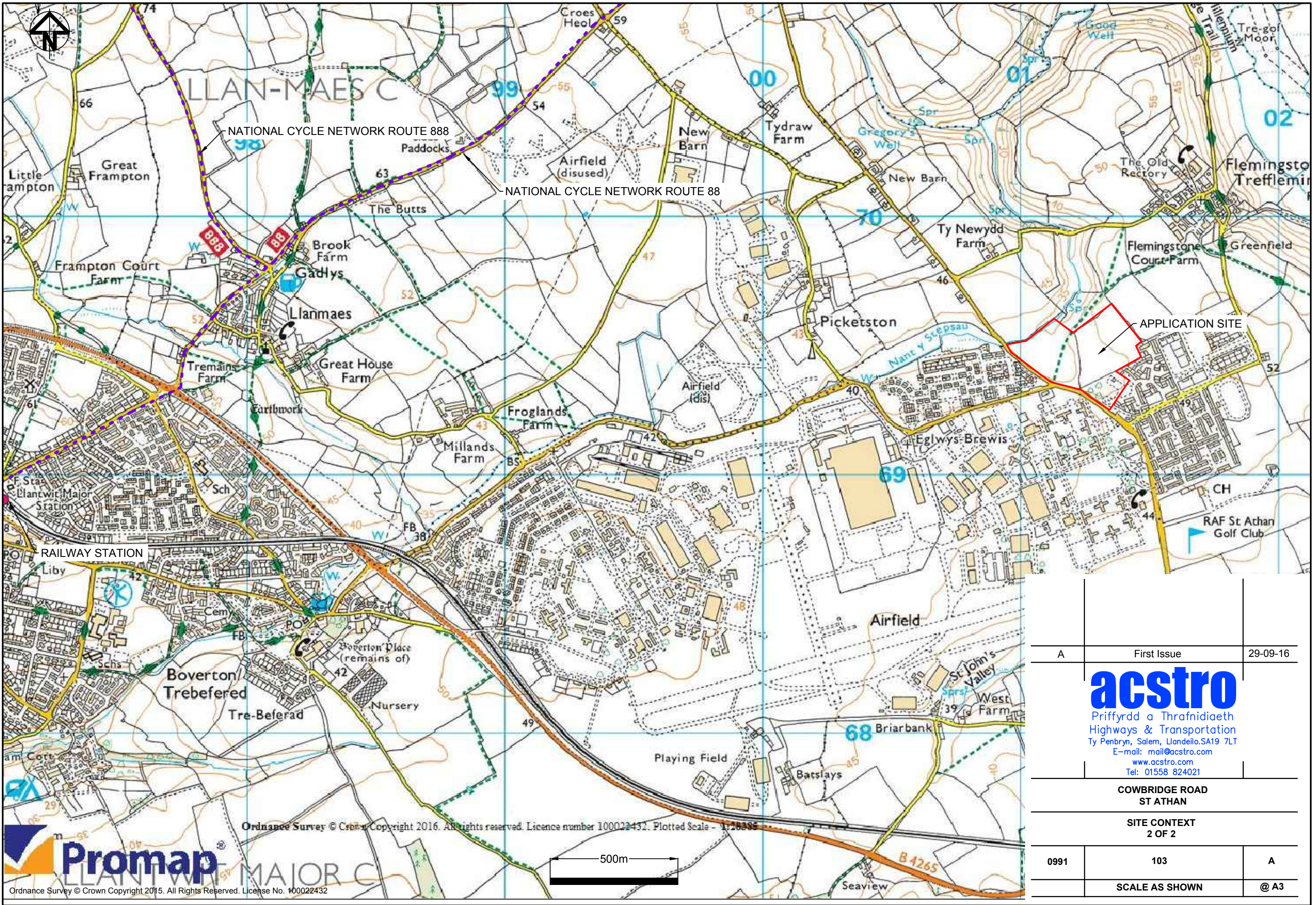
# Appendix 3




Scale



A	First Issue	29-09-16
<p>Prifffyrdd a Thrafnidiaeth Highways &amp; Transportation Ty Penbryn, Salem, Llandello.SA19 7LT E-mail: mail@acstro.com www.acstro.com Tel: 01558 824021</p>		
<p><b>COWBRIDGE ROAD ST ATHAN</b></p>		
<p><b>SITE CONTEXT 1 OF 2</b></p>		
0991	102	A
Scale as Shown		@ A4



A	First Issue	29-09-16
 <p>Priffyrdd a Thrafnidiaeth Highways &amp; Transportation Ty Penryn, Salem, Llandeilo, SA19 7LT E-mail: mail@acstro.com www.acstro.com Tel: 01558 824021</p>		
<p><b>COWBRIDGE ROAD ST ATHAN</b></p>		
<p><b>SITE CONTEXT 2 OF 2</b></p>		
0991	103	A
SCALE AS SHOWN		@ A3

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Highways & Transportation Consultants

# Appendix 4

# Cardiff Bus

## Cardiff - Llantwit Major

via Leckwith, Wenvoe, Rhoose, St Athan

Capital Links

X91

### Monday to Friday

Ref.No.: VBL1

Commencing Date: 04/09/2016

CHURCHILL WAY	...	...	...	...	1642	1720
CUSTOMHOUSE ST	0807	1007	1207	1407	1647	1730
Leckwith Retail Park	0817	1017	1217	1417	1657	1742
Ruhr Cross	0824	1024	1224	1424	1704	1750
Station Rd	0828	1028	1228	1428	1708	1754
Merthyr Dyfan Road	0833	1033	1233	1433	1713	1800
Highlight Park	0837	1037	1237	1437	1717	1803
Weycock Cross	0839	1039	1239	1439	1719	1806
Rhoose (Station Road)	0845	1045	1245	1445	1725	1812
Aberthaw (Blue Anchor)	0850	1050	1250	1450	1730	1817
St Athan Village	0857	1057	1257	1457	1737	1824
East Camp	0859	1059	1259	1459	1739	1826
North Gate	0900	1100	1300	1500	1740	1827
Boverton Castle	0906	1106	1306	1506	1746	1833
Llantwit Major Bus Station	0911	1111	1311	1511	1751	1836

## Llantwit Major - Cardiff

via St Athan, Rhoose, Wenvoe, Leckwith

X91

### Monday to Friday

Ref.No.: VBL1

Commencing Date: 04/09/2016

					A	
Llantwit Major Bus Station	0704	0915	1115	1315	1515	1800 1840
Monmouth Way	0706	0917	1117	1317	1517	1802 1842
Boverton Castle	0709	0920	1120	1320	1520	1805 1845
North Gate	0714	0925	1125	1325	1525	1810 1850
East Camp	0717	0928	1128	1328	1528	1813 1853
St Athan Village	0720	0931	1131	1331	1531	1816 1856
Aberthaw (Blue Anchor)	0726	0937	1137	1337	1537	1822 1902
Rhoose (Station Road)	0731	0942	1142	1342	1542	1827 1907
Weycock Cross	0736	0947	1147	1347	...	1832 1912
Highlight Park	0738	0948	1148	1348	...	1833 1913
Williams Stores	...	...	...	...	1552	...
Merthyr Dyfan Road	0741	0951	1151	1351	1558	1836 1916
Wenvoe	0749	0955	1155	1355	1602	1840 1920
Ruhr Cross	0753	0958	1158	1358	1605	1843 1923
Leckwith Retail Park	0801	1004	1204	1404	...	1849 1929
Customhouse Street	...	1017	1217	1417	1635	1900 1942
Churchill Way	0821	...	...	...	...	...

A - this journey runs along Cowbridge Road West and Canton NOT Ely Link Road and Leckwith Road.  
 Service X91 observes only these bus stops from Cardiff Central Stn, Tudor St, Smeaton St, Leckwith Rd(Sloper Rd), Leckwith Rd (ASDA), Rhur Cross (Valegate), The Alps, Wenvoe (Station Rd), Port Rd (Merthyr Dyfan Rd), Highlight Park (Port Rd) then all stops

## Cardiff Bus

### Cardiff - Llantwit Major

via Leckwith, Wenvoe, Rhoose, St Athan

Capital Links

X91

#### Saturday

Ref.No.: VBL1

Commencing Date: 04/09/2016

CUSTOMHOUSE STREET	0827	1027	1227	1427	1627	1807
Leckwith Retail Park	0837	1037	1237	1437	1637	1817
Ruhr Cross	0844	1044	1244	1444	1644	1824
Station Rd	0848	1048	1248	1448	1648	1828
Merthyr Dyfan Road	0853	1053	1253	1453	1653	1833
Highlight Park	0857	1057	1257	1457	1657	1837
Weycock Cross	0859	1059	1259	1459	1659	1839
Rhoose (Station Road)	0905	1105	1305	1505	1705	1845
Aberthaw (Blue Anchor)	0910	1110	1310	1510	1710	1850
St Athan Village	0917	1117	1317	1517	1717	1857
East Camp	0919	1119	1319	1519	1719	1859
North Gate	0920	1120	1320	1520	1720	1900
Boverton Castle	0926	1126	1326	1526	1726	1906
Llantwit Major Bus Station	0931	1131	1331	1531	1731	1911

### Llantwit Major - Cardiff

via St Athan, Rhoose, Wenvoe, Leckwith

X91

#### Saturday

Ref.No.: VBL1

Commencing Date: 04/09/2016

LLANTWIT MAJOR (Bus Station)	0715	0935	1135	1335	1535	1735	1915
Monmouth Way	0717	0937	1137	1337	1537	1737	1917
Boverton Castle	0720	0940	1140	1340	1540	1740	1920
North Gate	0725	0945	1145	1345	1545	1745	1925
East Camp	0728	0948	1148	1348	1548	1748	1928
St Athan Village	0731	0951	1151	1351	1551	1751	1931
Aberthaw (Blue Anchor)	0737	0957	1157	1357	1557	1757	1937
Rhoose (Station Road)	0742	1002	1202	1402	1602	1802	1942
Weycock Cross	0747	1007	1207	1407	1607	1807	1947
Highlight Park	0748	1008	1208	1408	1608	1808	1948
Merthyr Dyfan Road	0751	1011	1211	1411	1611	1811	1951
Wenvoe	0755	1015	1215	1415	1615	1815	1955
Ruhr Cross	0758	1018	1218	1418	1618	1818	1958
Leckwith Retail Park	0804	1024	1224	1424	1624	1824	2004
CUSTOMHOUSE STREET	0817	1037	1237	1437	1637	1837	2017

**303 304****303 304****Pen-y-Bont ar Ogwr - Barri - Caerdydd****Bridgend - Barry - Cardiff**

**303 DRWY / VIA:** Ewenny, Ogmores-by-Sea, Southerndown, St Bride's Major, Wick, Broughton, Monknash, Marcross, St Donat's, Llantwit Major, Boverton, Eglwys Brewis, St Athan, East Aberthaw, Rhose, Airport (Port Road; not passenger terminal), Barry Hospital & College.

**304 DRWY / VIA:** Weston Square, Ty Verlon Industrial Estate, Dinas Powys, Eastbrook, Llandough Hospital (main outpatients, main entrance & CaVOC), Cardiff Bay Sports Village, Cardiff Bay Retail Park (Ferry Road), Cardiff Bay (Millennium Centre), Cardiff (Custom House Street).

**NEW ADVENTURE TRAVEL (Tel / Ffôn: 029 20442040)****o / from 11.07.2016****Llwybr:****Route:**

**303: BRIDGEND:** Bridgend Bus Station (Bay 1): Outbound via inner by-pass (A4061/A4063 / A473 Langennau Strasse), Ewenny Rd (B4265), Ogmores Rd (B4524), OGMORES VILLAGE: Ogmores Rd (B4524), OGMORES-BY-SEA: Main Rd (B4524), SOUTHERNDOWN: B4524, ST BRIDE'S MAJOR: Southerndown Rd (B4524), Wick Rd (B4265), WICK: St Bride's Rd (B4265), Church St, The Green bus stop, Broughton Rd, West St, BROUGHTON: West St, Water St, MONKNASH Heol Las, MARCROSS: Heol Las, ST DONATS: Dimlands Rd (Castle and Atlantic College), LLANTWIT MAJOR: Dimlands Rd, College St, Church St, East St, Boverton Rd, Le Pouliguen Way, Llantwit Major Rail & Bus Interchange, Llanmaes Rd, Eagleswell Rd, BOVERTON: Boverton Rd, MOD ST ATHAN WEST CAMP: Eglwys Brewis Rd, EGLWYS BREWIS: Eglwys Brewis Rd, MOD ST ATHAN EAST CAMP: Cowbridge Rd, ST ATHAN VILLAGE: Cowbridge Rd (Beggars Pound),

Rectory Rd, Gileston Rd, GILESTON CROSS: War Memorial, B4265, EAST ABERTHAW: Burton, Fontygary Rd, RHOOSE: Fontygary Rd, Porthkerry Rd, Port Rd (Holiday Inn Express bus stop for Cardiff Airport), Port Rd (A4226), BARRY: Weycock Cross, Port Rd West (Tesco and Barry Comprehensive School), Colcot Rd (Barry Hospital, Ysgol Gyfun Bro Morgannwg, Cardiff & Vale College Barry Campus), Jenner Rd (Romilly School), Park Crescent (shops), St Nicholas Rd, Ship Inn gyratory, Park Ave, Broad St (Barry Rail Station / High Street shops), Gladstone Bridge, Ffordd y Mileniwm (Morrisons Store, Barry Waterfront), Gladstone Bridge, Civic Offices, Buttrills Rd (lower), Gladstone Rd, Tynewydd Rd, BARRY TOWN CENTRE (Stop 1 David Davies Court, Tynewydd Rd to Cardiff / Stop 3 Library to Bridgend) **NOTE. Services 303 and 304 are linked and provide a through service without the need to change buses.**

**304: BARRY TOWN CENTRE** (Stop 1 David Davies Court, Tynewydd Rd to Cardiff / Stop 3 Library to Bridgend), Wyndham St, Court Rd, Gladstone Rd, Weston Sq., Cardiff Rd (A4055 for Ty Verlon Industrial Estate), DINAS POWYS: Cardiff Rd (A4055), EASTBROOK: Cardiff Rd (A4055), LLANDOUGH: Penlan Rd, Llandough Hospital bus stops 2 (Main Outpatients), 3 (Main Entrance), 4 (CaVOC), Penlan Rd, Merrie Harrier, Barry Rd (A4055), Barons Court junction, Cogan Spur (A4055), CARDIFF BAY SPORTS VILLAGE: Dunleavy Drive, Watkiss Drive, Olympian Drive, International Drive (Morrisons), CARDIFF BAY RETAIL PARK: Ferry Road, GRANGETOWN: Avondale Rd, Clarence Rd, CARDIFF BAY: James St (A4119), The Flourish for the Millennium Centre, Lloyd George Ave (A470), Herbert St, Hayes Bridge Road., Custom House St for CARDIFF CITY CENTRE.

**RETURN JOURNEYS: Operate as above in reverse order except:**

BRIDGEND: from Ewenny Rd (B4265) via Nolton St, Rhiw Arcade, Derwen Rd, A4061 to Bridgend Bus Station (Bay 1).

BARRY: from Barry Town Centre bus stop 3 (Library) to Civic Offices bus stop 1 (Clinic) via Holton Road.

CARDIFF CITY CENTRE: From Customhouse Street via Mill Lane, Canal Street and Hayes Bridge Road to Herbert St.

CARDIFF SPORTS VILLAGE: From International drive (Morrisons) direct onto Cogan Spur (A4055); not via Watkiss Drive or Dunleavy Drive.

NOTE: Certain journeys operate via direct routes between certain timing points, as shown on the timetable where times have been omitted.

## Nodiadau / Notes

303	Bridgend Bus Station (Bay 1) =	....	0727	0900	0937	1037	1137	1237	1337	1437	1537	1637	1737	
	Ewenny	....	0734	0905	0944	1044	1144	1244	1344	1444	1544	1644	1744	
	Ogmore-by-Sea (Post Office)	....	0741	....	0951	1051	1151	1251	1351	1451	1551	1651	1751	
	Southerndown (3 Golden Cups)	....	0745	....	0955	1055	1155	1255	1355	1455	1555	1655	1755	
	St Bride's Major (Farmers Arms)	....	0749	0908	0959	1059	1159	1259	1359	1459	1559	1659	1759	
	Wick (Village Shop)	....	0752	0912	1002	1102	1202	1302	1402	1502	1602	1702	1802	
	Broughton (West Street)	....	0754	....	1004	1104	1204	1304	1404	1504	1604	1704	1804	
	Monknash	....	0756	....	1006	1106	1206	1306	1406	1506	1606	1706	1806	
	Marcross	....	0759	....	1009	1109	1209	1309	1409	1509	1609	1709	1809	
	St Donat's (Atlantic College)	....	0802	....	1012	1112	1212	1312	1412	1512	1612	1712	1812	
	Llantwit Major (Rail & Bus Interchange) arrive =	....	0810	0920	1020	1120	1220	1320	1420	1520	1620	1720	1820	
	Llantwit Major (Rail & Bus Interchange) depart =	0722	0812	0922	1022	1122	1222	1322	1422	1522	1622	1722	1822	
	Llanmaes Road	0724	0814	0924	1024	1124	1224	1324	1424	1524	1624	1724	1824	
	Eagleswell Road	0726	0816	0926	1026	1126	1226	1326	1426	1526	1626	1726	1826	
	Boverton (opposite shops)	0729	0819	0929	1029	1129	1229	1329	1429	1529	1629	1729	1829	
	Eglwys Brewis	0734	0824	0934	1034	1134	1234	1334	1434	1534	1634	1734	1834	
	MOD St Athan (opposite East Gate)	0736	0826	0936	1036	1136	1236	1336	1436	1536	1636	1736	1836	
	St Athan Village	0740	0830	0940	1040	1140	1240	1340	1440	1540	1640	1740	1840	
	East Aberthaw (Blue Anchor)	0745	0835	0945	1045	1145	1245	1345	1445	1545	1645	1745	1845	
	Rhoose (opposite Station Road / Spar) =	0750	0840	0950	1050	1150	1250	1350	1450	1550	1650	1750	1850	
	Holiday Inn, Port Road (for Cardiff Airport)	0755	0845	0955	1055	1155	1255	1355	1455	1555	1655	1755	1855	
	Port Road West (Tesco)	0800	0850	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	
	Barry Hospital (Colcot Road)	0802	0852	1002	1102	1202	1302	1402	1502	1602	1702	1802	1902	
	Cardiff & Vale College (Colcot Road)	0803	0853	1003	1103	1203	1303	1403	1503	1603	1703	1803	1903	
	Park Crescent	0807	0857	1007	1107	1207	1307	1407	1507	1607	1707	1807	1907	
	Broad Street (Windsor Court) =	0810	0900	1010	1110	1210	1310	1410	1510	1610	1710	1810	1910	
	Ffordd y Mileniwm (Morrisons Store)	0814	0904	1014	1114	1214	1314	1414	1514	1614	1714	1814	1914	
	Civic Offices (Stop 2 Newydd Housing Association)	0816	0906	1016	1116	1216	1316	1416	1516	1616	1716	1816	1916	
	Barry Town Centre (Stop 1 Davies House)	0820	0910	1020	1120	1220	1320	1420	1520	1620	1720	1820	1920	
	304	Weston Square (Gladstone Road) =	0823	0913	1023	1123	1223	1323	1423	1523	1623	1723	1823	1923
		Ty Verlon Industrial Estate (Cardiff Road)	0825	0915	1025	1125	1225	1325	1425	1525	1625	1725	1825	1925
		Dinas Powys Rail Station (Cardiff Road) =	0828	0918	1028	1128	1228	1328	1428	1528	1628	1728	1828	1928
		Eastbrook Rail Station (Cardiff Road) =	0830	0920	1030	1130	1230	1330	1430	1530	1630	1730	1830	1930
Merrie Harrier (Penlan Road)		0832	0922	1032	1132	1232	1332	1432	1532	1632	1732	1832	1932	
Llandough Hospital (Stops 2, 3, 4)		0835	0925	1035	1135	1235	1335	1435	1535	1635	1735	1835	1935	
Merrie Harrier (Barry Road)		0838	0928	1038	1138	1238	1338	1438	1538	1638	1738	1838	1938	
Cardiff Bay Sports Village (Morrisons)		0843	0934	1043	1143	1243	1343	1443	1543	1643	1743	1843	1943	
Cardiff Bay Retail Park (Asda, Ferry Road)		0845	0935	1045	1145	1245	1345	1445	1545	1645	1745	1845	1945	
Cardiff Bay (The Flourish for Millennium Centre) =		0852	0942	1052	1152	1252	1352	1452	1552	1652	1752	1852	1952	
Cardiff Centre (Custom House Street) =	0859	0949	1059	1159	1259	1359	1459	1559	1659	1759	1859	1959		



## Nodiadau / Notes

303	Bridgend Bus Station (Bay 1) =	1837	....	1937	2137	....	2337	....				
	Ewenny	1844	....	1944	2144	....	2344	....				
	Ogmore-by-Sea (Post Office)	1851	....	1951	2151	....	2351	....				
	Southerndown (3 Golden Cups)	1855	....	1955	2155	....	2355	....				
	St Bride's Major (Farmers Arms)	1859	....	1959	2159	....	2359	....				
	Wick (Village Shop)	1902	....	2002	2202	....	0002	....				
	Broughton (West Street)	1904	....	2004	2204	....	0004	....				
	Monknash	1906	....	2006	2206	....	0006	....				
	Marcross	1909	....	2009	2209	....	0009	....				
	St Donat's (Atlantic College)	1912	....	2012	2212	....	0012	....				
	Llantwit Major (Rail & Bus Interchange) arrive =	1920	....	2020	2220	....	0020	....				
	Llantwit Major (Rail & Bus Interchange) depart =	1922	1945	2022	2222	2340	0022	0040				
	Llanmaes Road	1924	....	2024	2224	....	0024	....				
	Eagleswell Road	1926	....	2026	2226	....	0026	....				
	Boverton (opposite shops)	1929	1948	2029	2229	2343	0029	0043				
	Eglwys Brewis	1934	....	2034	2234	....	0034	....				
	MOD St Athan (opposite East Gate)	1936	....	2036	2236	....	0036	....				
	St Athan Village	1940	....	2040	2240	....	0040	....				
	East Aberthaw (Blue Anchor)	1945	....	2045	2245	....	0045	....				
	Rhose (opposite Station Road / Spar)	1950	....	2050	2250	....	0050	....				
	Holiday Inn, Port Road (for Cardiff Airport)	1955	....	2055	2255	....	0055	....				
	Port Road West (Tesco)	2000	1958	2100	2300	2353	0100	0053				
	Barry Hospital (Colcot Road)	2002	2000	2102	2302	2355	0102	0055				
	Cardiff & Vale College (Colcot Road)	2003	2001	2103	2303	2356	0103	0056				
	Park Crescent	2007	....	2107	2307	....	0107	....				
	Broad Street (Windsor Court) =	2010	....	2110	2310	....	0110	....				
	Ffordd y Mileniwm (Morrisons Store)	2014	....	2114	2314	....	0114	....				
Civic Offices (Stop 2 Newydd Housing Association)	2016	....	2116	2316	....	0116	....					
Barry Town Centre (Stop 1 Davies House)	2020	2002	2120	2320	2358	0120	0058					
Weston Square (Gladstone Road) =	2023	2007	2123	2323	0002	0123	0102					
Ty Verlon Industrial Estate (Cardiff Road)	2025	2009	2125	2325	0004	0125	0104					
Dinas Powys Rail Station (Cardiff Road) =	2028	2012	2129	2329	0007	0129	0107					
Eastbrook Rail Station (Cardiff Road) =	2030	2016	2131	2331	0011	0131	0111					
Merrie Harrier (Penlan Road)	2032	....	2134	2334	....	0134	....					
Llandough Hospital (Stops 2, 3, 4)	2035	....	2138	2338	....	0138	....					
Merrie Harrier (Barry Road)	2038	2019	2141	2341	0014	0141	0114					
Cardiff Sports Village (Morrisons Store)	2043	2025	2147	2347	0020	0147	0120					
Cardiff Bay Retail Park (Asda, Ferry Road)	2045	2027	2149	2349	0022	0149	0122					
Cardiff Bay (The Flourish for Millennium Centre) =	2052	2031	2156	2356	0026	0156	0126					
Cardiff Centre (Custom House Street) =	2059	2040	2205	0005	0035	0205	0135					

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## Nodiadau / Notes

303	Bridgend Bus Station (Bay 1) =	....	....	1107	1307	1507	1707	1907	2107	....	2307	
	Ewenny	....	....	1112	1312	1512	1712	1912	2112	....	2312	
	Ogmore-by-Sea (Post Office)	....	....	1120	1320	1520	1720	1920	2120	....	2320	
	Southerndown (3 Golden Cups)	....	....	1125	1325	1525	1725	1925	2125	....	2325	
	St Bride's Major (Farmers Arms)	....	....	1129	1329	1529	1729	1929	2129	....	2329	
	Wick (Village Shop)	....	....	1133	1333	1533	1733	1933	2133	....	2333	
	Broughton (West Street)	....	....	1138	1338	1538	1738	1938	2138	....	2338	
	Monknash	....	....	1140	1340	1540	1740	1940	2140	....	2340	
	Marcross	....	....	1143	1343	1543	1743	1943	2143	....	2343	
	St Donat's (Atlantic College)	....	....	1146	1346	1546	1746	1946	2146	....	2346	
	Llantwit Major (Rail & Bus Interchange) arrive =	....	....	1152	1352	1552	1752	1952	2152	....	2352	
	Llantwit Major (Rail & Bus Interchange) depart =	0719	0819	1157	1357	1557	1757	1957	2157	2354	2357	
	Llanmaes Road	0720	0820	1158	1358	1558	1758	1958	2158	....	2358	
	Eagleswell Road	0721	0821	1159	1359	1559	1759	1959	2159	....	2359	
	Boverton (opposite shops)	0723	0823	1201	1401	1601	1801	2001	2201	2357	0001	
	Eglwys Brewis	0727	0827	1205	1405	1605	1805	2005	2205	....	0005	
	MOD St Athan (opposite East Gate)	0729	0829	1209	1409	1609	1809	2009	2209	....	0009	
	St Athan Village	0731	0831	1211	1411	1611	1811	2011	2211	....	0011	
	East Aberthaw (Blue Anchor)	0736	0836	1216	1416	1616	1816	2016	2216	....	0016	
	Rhose (opposite Station Road / Spar) =	0740	0840	1220	1420	1620	1820	2020	2220	....	0020	
	Holiday Inn, Port Road (for Cardiff Airport)	0744	0844	1224	1424	1624	1824	2024	2224	....	0024	
	Port Road (Tesco)	0747	0847	1227	1427	1627	1827	2027	2227	0007	0027	
	Barry Hospital (Colcot Road)	0748	0848	1228	1428	1628	1828	2028	2228	....	0028	
	Cardiff & Vale College (Colcot Road)	0749	0849	1229	1429	1629	1829	2029	2229	....	0029	
	Park Crescent	0754	0854	1234	1434	1634	1834	2034	2234	....	0034	
	Broad Street (Windsor Court) =	0757	0857	1237	1437	1637	1837	2037	2237	....	0037	
	Ffordd y Mileniwm (Morrisons Store)	....	....	....	....	....	....	....	....	....	....	
	Civic Offices (Stop 2 Newydd Housing Association)	0800	0900	1240	1440	1640	1840	2040	2240	....	0040	
	Barry Town Centre (Stop 1 Davies House) arrive	0802	0902	1242	1442	1642	1842	2042	2242	....	0042	
	Barry Town Centre (Stop 1 Davies House) depart	0802	0902	1245	1445	1645	1845	2045	2245	....	0045	
	Weston Square (Gladstone Road) =	0805	0905	1248	1448	1648	1848	2048	2248	....	0048	
	Ty Verlon Industrial Estate (Cardiff Road)	0807	0907	1250	1450	1650	1850	2050	2250	....	0050	
	Dinas Powys Rail Station (Cardiff Road) =	0812	0912	1255	1455	1655	1855	2055	2255	0017	0055	
Eastbrook Rail Station (Cardiff Road) =	0814	0914	1257	1457	1657	1857	2057	2257	0019	0057		
Merrie Harrier (Penlan Road)	0817	0917	1300	1500	1700	1900	2100	2300	....	0100		
Llandough Hospital (Stops 2, 3, 4)	0819	0919	1302	1502	1702	1902	2102	2302	....	0102		
Merrie Harrier (Barry Road)	0821	0921	1304	1504	1704	1904	2104	2304	0021	0104		
Cardiff Bay Sports Village (Morrisons)	....	....	....	....	....	....	....	....	....	....		
Cardiff Bay Retail Park (Asda, Ferry Road)	0825	0925	1308	1508	1708	1908	2108	2308	0025	0108		
Cardiff Bay (The Flourish for Millennium Centre) =	0828	0928	1313	1513	1713	1913	2113	2313	0027	0113		
Cardiff Centre (Custom House Street) =	0832	0932	1317	1517	1717	1917	2117	2317	0030	0117		

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## Nodiadau / Notes

304	Cardiff Centre (Custom House Street) =	0600	0632	0702	0732	0802	0902	1002	1102	1202	1302	1402	1502
	Cardiff Bay (Millennium Centre) =	0604	0638	0708	0738	0808	0908	1008	1108	1208	1308	1408	1508
	Cardiff Bay Retail Park (Asda, Ferry Road)	0608	0645	0715	0745	0815	0915	1015	1115	1215	1315	1415	1515
	Cardiff Sports Village (Morrisons)	0610	0647	0717	0747	0817	0917	1017	1117	1217	1317	1417	1517
	Merrie Harrier (Penlan Road)	0612	0650	0720	0750	0820	0920	1020	1120	1220	1320	1420	1520
	Llandough Hospital (Stops 2, 3, 4)	0615	0652	0722	0752	0822	0922	1022	1122	1222	1322	1422	1522
	Merrie Harrier (Barry Road)	0618	0655	0725	0755	0825	0925	1025	1125	1225	1325	1425	1525
	Eastbrook Rail Station (Cardiff Road) =	0620	0658	0728	0758	0828	0928	1028	1128	1228	1328	1428	1528
	Dinas Powys Rail Station (Cardiff Road) =	0622	0701	0731	0801	0831	0931	1031	1131	1231	1331	1431	1531
	Ty Verlon Industrial Estate (Cardiff Road)	0625	0704	0734	0804	0834	0934	1034	1134	1234	1334	1434	1534
303	Weston Square (Gladstone Road) =	0627	0708	0738	0808	0838	0938	1038	1138	1238	1338	1438	1538
	Barry Town Centre (Stop 3 Library)	0630	0716	0746	0816	0846	0946	1046	1146	1246	1346	1446	1546
	Civic Offices (Stop 1 Clinic)	0632	0718	0748	0818	0848	0948	1048	1148	1248	1348	1448	1548
	Ffordd y Mileniwm (Morrisons Store)	0634	0720	0750	0820	0850	0950	1050	1150	1250	1350	1450	1550
	Broad Street (op. Windsor Court)	0636	0722	0752	0822	0852	0952	1052	1152	1252	1352	1452	1552
	Park Crescent	0641	0725	0755	0825	0855	0955	1055	1155	1255	1355	1455	1555
	Cardiff & Vale College (Colcot Road)	0642	0728	0758	0828	0858	0958	1058	1158	1258	1358	1458	1558
	Barry Hospital (Colcot Road)	0643	0729	0759	0829	0859	0959	1059	1159	1259	1359	1459	1559
	Port Road (Barry Comprehensive School)	0644	0731	0801	0831	0901	1001	1101	1201	1301	1401	1501	1601
	Holiday Inn, Port Road (for Cardiff Airport)	0648	0735	0805	0835	0905	1005	1105	1205	1305	1405	1505	1605
	Rhose (Station Road / Spar) =	0652	0740	0810	....	0910	1010	1110	1210	1310	1410	1510	1610
	East Aberthaw (opposite Blue Anchor)	0656	0745	0815	....	0915	1015	1115	1215	1315	1415	1515	1615
	St Athan Village	0700	0750	0820	....	0920	1020	1120	1220	1320	1420	1520	1620
	MOD St Athan (East Gate)	0703	0753	0823	....	0923	1023	1123	1223	1323	1423	1523	1623
	Eglwys Brewis	0705	0755	0825	....	0925	1025	1125	1225	1325	1425	1525	1625
	Boverton (shops)	0709	0800	0830	....	0930	1030	1130	1230	1330	1430	1530	1630
	Eagleswell Road	0712	0803	0833	....	0933	1033	1133	1233	1333	1433	1533	1633
	Llanmaes Road	0715	0806	0836	....	0936	1036	1136	1236	1336	1436	1536	1636
	Llantwit Major (Rail & Bus Interchange) arrive =	0717	0809	0839	....	0939	1039	1139	1239	1339	1439	1539	1639
	Llantwit Major (Rail & Bus Interchange) depart =	....	0812	0842	....	0942	1042	1142	1242	1342	1442	1542	1642
	St Donat's (Atlantic College)	....	0820	0850	....	0950	1050	1150	1250	1350	1450	1550	1650
	Marcross	....	0823	0853	....	0953	1053	1153	1253	1353	1453	1553	1653
	Monknash	....	0826	0856	....	0956	1056	1156	1256	1356	1456	1556	1656
	Broughton (West Street)	....	0828	0858	....	0958	1058	1158	1258	1358	1458	1558	1658
	Wick (op. Village Shop)	....	0830	0900	....	1000	1100	1200	1300	1400	1500	1600	1700
	St Bride's Major (op. Farmers Arms)	....	0834	0904	....	1004	1104	1204	1304	1404	1504	1604	1704
	Southerndown (op. 3 Golden Cups)	....	0838	0908	....	1008	1108	1208	1308	1408	1508	1608	1708
	Ogmore-by-Sea (op. Post Office)	....	0843	0913	....	1013	1113	1213	1313	1413	1513	1613	1713
	Ewenny	....	0850	0920	....	1020	1120	1220	1320	1420	1520	1620	1720
	Bridgend Bus Station (Bay 1) =	....	0859	0929	....	1029	1129	1229	1329	1429	1529	1629	1729

## Nodiadau / Notes

304	Cardiff Centre (Custom House Street) =	1602	1650	1750	1902	2002	2202	2302				
	Cardiff Bay (Millennium Centre) =	1608	1656	1756	1908	2008	2208	2308				
	Cardiff Bay Retail Park (Asda, Ferry Road)	1615	1705	1805	1915	2015	2215	2315				
	Cardiff Bay Sports Village (Morrisons)	1617	1710	1817	1917	2017	2217	2317				
	Merrie Harrier (Penlan Road)	1620	1717	1817	1920	2020	2220	2320				
	Llandough Hospital Stops 2, 3, 4)	1622	1720	1820	1922	2022	2222	2322				
	Merrie Harrier (Barry Road)	1625	1722	1822	1925	2025	2225	2325				
	Eastbrook Rail Station (Cardiff Road) =	1628	1728	1828	1928	2028	2228	2328				
	Dinas Powys Rail Station (Cardiff Road) =	1631	1731	1831	1931	2031	2231	2331				
	Ty Verlon Industrial Estate (Cardiff Road)	1634	1734	1834	1934	2034	2234	2334				
	Weston Square (Gladstone Road) =	1638	1738	1838	1938	2038	2238	2338				
	Barry Town Centre (Stop 3 Library) =	1646	1746	1846	1946	2046	2246	2346				
303	Civic Offices (Stop 1 Clinic)	1648	1748	1848	1948	2048	2248	2348				
	Ffordd y Mileniwm (Morrisons Store)	1650	1750	1850	1950	2050	2250	2350				
	Broad Street (op. Windsor Court)	1652	1752	1852	1952	2052	2252	2352				
	Park Crescent	1655	1755	1855	1955	2055	2255	2355				
	Cardiff & Vale College (Colcot Road)	1658	1758	1858	1958	2058	2258	2358				
	Barry Hospital (Colcot Road)	1659	1759	1859	1959	2059	2259	2359				
	Port Road (Barry Comprehensive School)	1701	1801	1901	2001	2101	2301	0001				
	Holiday Inn, Port Road (for Cardiff Airport)	1705	1805	1905	2005	2105	2305	0005				
	Rhose (Station Road / Spar) =	1710	1810	1910	2010	2110	2310	0010				
	East Aberthaw (opposite Blue Anchor)	1715	1815	1915	2015	2115	2315	0015				
	St Athan Village	1720	1820	1920	2020	2120	2320	0020				
	MOD St Athan (East Gate)	1723	1823	1923	2023	2123	2323	0023				
	Eglwys Brewis	1725	1825	1925	2025	2125	2325	0025				
	Boverton (shops)	1730	1830	1930	2030	2130	2330	0030				
	Eagleswell Road	1733	1833	1933	2033	2133	2333	0033				
	Llanmaes Road	1736	1836	1936	2036	2136	2336	0036				
	Llantwit Major (Rail & Bus Interchange) arrive =	1739	1839	1939	2039	2139	2339	0039				
	Llantwit Major (Rail & Bus Interchange) depart =	1742	1842	....	2042	2142	....	....	....			
	St Donat's (Atlantic College)	1750	1850	....	2050	2150	....	....	....			
	Marcross	1753	1853	....	2053	2153	....	....	....			
	Monknash	1756	1856	....	2056	2156	....	....	....			
	Broughton (West Street)	1758	1858	....	2058	2158	....	....	....			
	Wick (op. Village Shop)	1800	1900	....	2100	2200	....	....	....			
	St Bride's Major (op. Farmers Arms)	1804	1904	....	2104	2204	....	....	....			
	Southerndown (op. 3 Golden Cups)	1808	1908	....	2108	2208	....	....	....			
	Ogmore-by-Sea (op. Post Office)	1813	1913	....	2113	2213	....	....	....			
	Ewenny	1820	1920	....	2120	2220	....	....	....			
	Bridgend Bus Station (Bay 1) =	1829	1929	....	2129	2229	....	....	....			

## Nodiadau / Notes

304	Cardiff Centre (Custom House Street) =	0641	0741	0836	1036	1236	1436	1636	1836	2036	2236	
	Cardiff Bay (Millennium Centre) =	0644	0744	0840	1040	1240	1440	1640	1840	2040	2240	
	Cardiff Bay Retail Park (Asda, Ferry Road)	0647	0747	0845	1045	1245	1445	1645	1845	2045	2245	
	Cardiff Bay Sports Village (Morrisons)	....	....	....	....	....	....	....	....	....	....	
	Merrie Harrier (Penlan Road)	....	....	0849	1049	1249	1449	1649	1849	2049	2249	
	Llandough Hospital (Stops 2, 3, 4)	....	....	0851	1051	1251	1451	1651	1851	2051	2251	
	Merrie Harrier (Barry Road)	0650	0750	0853	1053	1253	1453	1653	1853	2053	2253	
	Eastbrook Rail Station (Cardiff Road) =	0652	0752	0857	1057	1257	1457	1657	1857	2057	2257	
	Dinas Powys Rail Station (Cardiff Road) =	0654	0754	0859	1059	1259	1459	1659	1859	2059	2259	
	Ty Verlon Industrial Estate (Cardiff Road)	....	....	0904	1104	1304	1504	1704	1904	2104	2304	
	Weston Square (Gladstone Road) =	....	....	0906	1106	1306	1506	1706	1906	2106	2306	
	Barry Town Centre (Stop 3 Library) arrive	....	....	0912	1112	1312	1512	1712	1912	2112	2312	
303	Barry Town Centre (Stop 3 Library) depart	....	....	0915	1115	1315	1515	1715	1915	2115	2315	
	Civic Offices (Stop 1 Clinic)	....	....	0917	1117	1317	1517	1717	1917	2117	2317	
	Ffordd y Mileniwm (Morrisons Store)	....	....	....	....	....	....	....	....	....	....	
	Broad Street (op. Windsor Court)	....	....	0920	1120	1320	1520	1720	1920	2120	2320	
	Park Crescent	....	....	0923	1123	1323	1523	1723	1923	2123	2323	
	Cardiff & Vale College (Colcot Road)	....	....	0928	1128	1328	1528	1728	1928	2128	2328	
	Barry Hospital (Colcot Road)	....	....	0929	1129	1329	1529	1729	1929	2129	2329	
	Port Road (Barry Comprehensive School)	0704	0804	0930	1130	1330	1530	1730	1930	2130	2330	
	Holiday Inn, Port Road (for Cardiff Airport)	....	....	0933	1133	1333	1533	1733	1933	2133	2333	
	Rhose (Station Road / Spar) =	....	....	0937	1137	1337	1537	1737	1937	2137	2337	
	East Aberthaw (op. Blue Anchor)	....	....	0941	1141	1341	1541	1741	1941	2141	2341	
	St Athan Village	....	....	0946	1146	1346	1546	1746	1946	2146	2346	
	MOD St Athan (East Gate)	....	....	0948	1148	1348	1548	1748	1948	2148	2348	
	Eglwys Brewis	....	....	0952	1152	1352	1552	1752	1952	2152	2352	
	Boverton (shops)	0714	0814	0956	1156	1356	1556	1756	1956	2156	2356	
	Eagleswell Road	....	....	0958	1158	1358	1558	1758	1958	2158	2358	
	Llanmaes Road	....	....	0959	1159	1359	1559	1759	1959	2159	2359	
	Llantwit Major (Rail & Bus Interchange) arrive =	0717	0817	1000	1200	1400	1600	1800	2000	2200	0000	
	Llantwit Major (Rail & Bus Interchange) depart =	....	....	1005	1205	1405	1605	1805	2005	2205	....	
	St Donat's (Atlantic College)	....	....	1011	1211	1411	1611	1811	2011	2211	....	
	Marcross	....	....	1014	1214	1414	1614	1814	2014	2214	....	
	Monknash	....	....	1017	1217	1417	1617	1817	2017	2217	....	
	Broughton (West Street)	....	....	1019	1219	1419	1619	1819	2019	2219	....	
	Wick (op. Village Shop)	....	....	1024	1224	1424	1624	1824	2024	2224	....	
	St Bride's Major (op. Farmers Arms)	....	....	1028	1228	1428	1628	1828	2028	2228	....	
	Southerndown (op. 3 Golden Cups)	....	....	1032	1232	1432	1632	1832	2032	2232	....	
	Ogmore-by-Sea (op. Post Office)	....	....	1037	1237	1437	1637	1837	2037	2237	....	
	Ewenny	....	....	1045	1245	1445	1645	1845	2045	2245	....	
	Bridgend Bus Station (Bay 1) arrive =	....	....	1050	1250	1450	1650	1850	2050	2250	....	

## 303 304 Gwybodaeth Ychwanegol

## Additional Information 303 304

## Cardiff - Major Event Days

Due to possible road closures that may affect the normal operation of this service, please check with New Adventure Travel prior to travel on major event days for any temporary service changes.

## Bank Holidays

Sunday service on bank holiday Monday's (i.e. Easter Monday, Early May, Spring, Late Summer).

Monday to Saturday service on Good Friday bank holidays.

No service on 25th December, 26th December, 1st January.

## Stopping Arrangements

Serves all recognised bus stops along the line of route and 'hail & ride' at safe locations only.

## SUPPORTED SERVICE:

Various sections of this service are operated under contract to the Vale of Glamorgan Council:

Mondays to Saturdays (day and eve) between Bridgend and Llantwit Major.

Mondays to Saturdays (eve) between Llantwit Major and Cardiff.

Sundays and bank holiday Mondays between Bridgend and Cardiff.

**905****RAIL LINK****905****Rhws - Maes Awyr Caerdydd a Sain Tathan****Rhoose - Cardiff Airport and St Athan**

DRWY / VIA: Holiday Inn Express, Cardiff Airport and on certain journeys BAMC, St Athan, MOD St Athan, Eglwys Brewis

**NEW ADVENTURE TRAVEL (Tel / Ffôn: 029 20442040)****o / from: 02.07.2012****Llwybr:****Route:**

RHOOSE: Rhoose Cardiff Airport Rail Interchange, Station Rd, Fontygary Rd, Porthkerry Rd, Port Rd, HOLIDAY INN EXPRESS (main entrance in car park),  
 CARDIFF AIRPORT: airport access roads to/from the passenger terminal building, HOLIDAY INN EXPRESS (main entrance in car park), Port Rd, Porthkerry Rd,  
 RHOOSE POINT: Pentir Y De, Trem Echni, Heol y Pentir, RHOOSE: Rhoose Cardiff Airport Rail Interchange. B4265, ST ATHAN: Gileston Cross, Rectory Rd, MOD  
 ST ATHAN (East Gate): Cowbridge Rd, EGLWYS BREWIS: Eglwys Brewis Rd, MOD ST ATHAN (West Camp): Eglwys Brewis Rd, B4265 direct back to CARDIFF  
 AIRPORT: airport access roads to/from the passenger terminal building,

Certain peak time journeys also run to/from MOD St Athan (Enterprise Zone) from Cardiff Airport via B4265, ST ATHAN: Gileston Cross, Rectory Rd, MOD ST  
 ATHAN (East Gate): Cowbridge Rd, EGLWYS BREWIS: Eglwys Brewis Rd, MOD ST ATHAN (West Camp): Eglwys Brewis Rd, B4265 direct back to CARDIFF  
 AIRPORT and Rhoose Cardiff Airport Rail Interchange.

**905****RAIL LINK****905****DYDD LLUN hyd DDYDD GWENER****MONDAYS to FRIDAYS**

Nodiadau / Notes		A	A	A						A	A	A	
Rhoose Rail Interchange	....	0616	0716	0816	0916	1016	1116	1216	1316	1416	1516	1616	1716
Holiday Inn Express (main entrance)	....	0620	0720	0820	0920	1020	1120	1220	1320	1420	1520	1620	1720
Cardiff Airport (arrive/depart)	....	0623	0723	0823	0923	1023	1123	1223	1323	1423	1523	1623	1723
BAMC (Cardiff Airport access road)	....	....	0725	0825	0925	....	....	....	....	....	1525	1625	1725
MOD St Athan (Eastgate)	....	....	0732	0832	0932	....	....	....	....	....	1532	1632	1732
MOD St Athan (Westgate)	....	....	0735	0835	0935	....	....	....	....	....	1535	1635	1735
BAMC (Cardiff Airport access road)	....	....	0743	0843	0943	....	....	....	....	....	1543	1643	1743
Cardiff Airport (arrive)	....	0623	0745	0845	0945	1023	1123	1223	1323	1423	1545	1645	1745
Cardiff Airport (depart)	0551	0651	0751	0851	0951	1051	1151	1251	1351	1451	1551	1651	1751
Holiday Inn Express (main entrance)	0553	0653	0753	0853	0953	1053	1153	1253	1353	1453	1553	1653	1753
Rhoose Rail Interchange	0558	0658	0758	0858	0958	1058	1158	1258	1358	1458	1558	1658	1758

**DYDD LLUN hyd DDYDD GWENER****MONDAYS to FRIDAYS**

Nodiadau / Notes													
Rhoose Rail Interchange	1816	1916	2016	2116	2216	2316							
Holiday Inn Express (main entrance)	1820	1920	2020	2120	2220	2320							
Cardiff Airport (arrive)	1823	1923	2023	2123	2223	2323							
Cardiff Airport (depart)	1851	1951	2051	2151	2251	....							
Holiday Inn Express (main entrance)	1853	1953	2053	2153	2253	....							
Rhoose Rail Interchange	1858	1958	2058	2158	2258	....							

DYDD SADWRN											SATURDAYS			
Nodiadau / Notes														
Rhose Rail Interchange	....	0616	0716	0816	0916	1016	1116	1216	1316	1416	1516	1616	1716	
Holiday Inn Express (main entrance)	....	0620	0720	0820	0920	1020	1120	1220	1320	1420	1520	1620	1720	
Cardiff Airport (arrive)	....	0623	0723	0823	0923	1023	1123	1223	1323	1423	1523	1623	1723	
Cardiff Airport (depart)	0551	0651	0751	0851	0951	1051	1151	1251	1351	1451	1551	1651	1751	
Holiday Inn Express (main entrance)	0553	0653	0753	0853	0953	1053	1153	1253	1353	1453	1553	1653	1753	
Rhose Rail Interchange	0558	0658	0758	0858	0958	1058	1158	1258	1358	1458	1558	1658	1758	

DYDD SADWRN											SATURDAYS			
Nodiadau / Notes														
Rhose Rail Interchange	1816	1916	2016	2116	2216	2316								
Holiday Inn Express (main entrance)	1820	1920	2020	2120	2220	2320								
Cardiff Airport (arrive)	1823	1923	2023	2123	2223	2323								
Cardiff Airport (depart)	1851	1951	2051	2151	2251	....								
Holiday Inn Express (main entrance)	1853	1953	2053	2153	2253	....								
Rhose Rail Interchange	1858	1958	2058	2158	2258	....								

DYDD SUL											SUNDAYS			
Nodiadau / Notes														
Rhose Rail Interchange	....	0916	1016	1116	1216	1316	1416	1516	1616	1716	1816	1916	2016	
Holiday Inn Express (main entrance)	....	0920	1020	1120	1220	1320	1420	1520	1620	1720	1820	1920	2020	
Cardiff Airport (arrive)	....	0923	1023	1123	1223	1323	1423	1523	1623	1723	1823	1923	2023	
Cardiff Airport (depart)	0851	0951	1051	1151	1251	1351	1451	1551	1651	1751	1851	1951	2051	
Holiday Inn Express (main entrance)	0853	0953	1053	1153	1253	1353	1453	1553	1653	1753	1853	1953	2053	
Rhose Rail Interchange	0858	0958	1058	1158	1258	1358	1458	1558	1658	1758	1858	1958	2058	

DYDD SUL											SUNDAYS			
Nodiadau / Notes														
Rhose Rail Interchange	2116	2216												
Holiday Inn Express	2120	2220												
Cardiff Airport (arrive)	2123	2223												
Cardiff Airport (depart)	2151	....												
Holiday Inn Express (On Request Only)	2153	....												
Rhose Rail Interchange	2158	....												

## 905 Gwybodaeth Ychwanegol Additional Information 905

**A** These journey provide continued service to/from MOD St Athan (Enterprise Zone)  
**Stopping Arrangements** Stops at all recognised bus stops on route and 'Hail and Ride' at safe locations only.  
**Cardiff Airport:** Telephone: 01446 711111  
**Arriva Trains Wales** Telephone: 0845 6061660

FARES:	Singles	Returns	Concessions
	£1.00 Adult	£1.50 Adult	£0.00 Welsh Concessionary Pass Holders
	£0.50 Child	£1.00 Child	

Tickets for the Rail Linc Shuttle Bus service can also be purchased onboard the train.

**SUPPORTED SERVICE:** This service is operated under contract to the Vale of Glamorgan Council with financial support by the Welsh Government.

**X45****X45****Llantwit Major - Barry****Llanilltud Fawr - Y Barry****VIA - DRWY: Boverton, Eglwys Brewis, St Athan, Rhoose, Barry, Cadoxton, Barry Town Centre & Morrisons****SPRINT TRANSPORT (CARTEL TRAVEL LTD)****o/from 24.07.2012**

**ROUTE - LWYBR:** LLANTWIT MAJOR: Llantwit Major Interchange, Le Pouliguen Way, Boverton Road, BOVERTON: Boverton Road, Eglwys Brewis Road, MOD ST ATHAN (West; opposite chapel), Eglwys Brewis Road, EGLWYS BREWIS, MOD ST ATHAN (East Gate), Cowbridge Road, ST ATHAN VILLAGE, Rectory Road, Gileston Road, Gileston Cross, B4265, Aberthaw Road, EAST ABERTHAW (side of Blue Anchor), FONMON: Fonmon Cross, RHOOSE: Fonmon Road, Fontygary Road, Porthkerry Road, Port Road for Holiday Inn Express and Cardiff Airport, Port Road, Weycock Cross, BARRY: Port Road West, Colcot Road, Jenner Road, Romilly Schools (Jenner Road), Park Crescent, St Nicholas Road, The Ship Inn gyratory, Broad Street, Gladstone Road, CADOXTON: Weston Square roundabout, Gladstone Road, Court Road, Wyndeham Street, Tynewydd Road: BARRY TOWN CENTRE (bus stop 3 - Library).

**RETURN:** Outbound: Fom BARRY TOWN CENTRE (bus stop 3) via Holton Road, Civic Offices, Gladstone Road Bridge, Barry Waterfront (Morrisons), Gladstone Bridge. Then as above in reverse from Broad Street to Boverton. Then via Eagleswell Road, Llanmaes Road, Le Pouliguen Way to Llantwit Major Interchange (not Boverton Road).

**X45 to Barry****X45 i Barri****MONDAYS to SATURDAYS****M-F a a a a a a a a a a a****DYDD LLUN hyd DDYDD SADWRN**

Llantwit Major Interchange (depart) =	0800	0900	1000	1100	1215	1300	1400	1500	1600	1700	1745	....	....
Boverton Road	0802	0902	1002	1102	1217	1302	1402	1502	1602	1702	1747	....	....
Boverton (opposite shops)	0803	0903	1003	1103	1218	1303	1403	1503	1603	1703	1748	....	....
St Athan Village	0810	0910	1010	1110	1223	1310	1410	1510	1610	1710	1755	....	....
East Aberthaw (side of Blue Anchor)	0815	0915	1015	1115	....	1315	1415	1515	1615	1715	1800	....	....
Fonmon Cross	0817	0917	1017	1117	....	1317	1417	1517	1617	1717	1802	....	....
Rhoose (Station Road) =	0821	0921	1021	1121	....	1321	1421	1521	1621	1721	1806	....	....
Holiday Inn Express (Port Road for Airport)	0825	0925	1025	1125	....	1325	1425	1525	1625	1725	1810	....	....
Colcot Road (Barry Hospital & College)	0835	0935	1035	1135	1235	1335	1435	1535	1635	1735	1820	....	....
Romilly Schools	0839	0939	1039	1139	1239	1339	1439	1539	1639	1739	1824	....	....
Broad Street (Windsor Court) =	0841	0941	1041	1141	1241	1341	1441	1541	1641	1741	1826	....	....
Gladstone Road (Adams Funeral Home)	0843	0943	1043	1143	1243	1343	1443	1543	1643	1743	1843	....	....
Weston Square (Gladstone Road) a	0845	0945	1045	1145	1245	1345	1445	1545	1645	1745	1845	....	....

**X45 to Llantwit Major****X45 i Llanilltud Fawr****MONDAYS to SATURDAYS****M-F b b b b b b b b b b b****DYDD LLUN hyd DDYDD SADWRN**

Weston Square (Gladstone Road) b	0655	0750	0845	0945	1045	1145	1245	1345	1445	1545	1645	....	....
Barry Town Centre (bus stop 3) depart	0700	0755	0855	0955	1055	1155	1255	1355	1455	1555	1655	....	....
Civic Offices (stop 1 - Clinic)	0702	0757	0857	0957	1057	1157	1257	1357	1457	1557	1657	....	....
Barry Waterfront (Morrisons)	....	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	....	....
Broad Street (opposite Windsor Court) =	0704	0802	0902	1002	1102	1202	1302	1402	1502	1602	1702	....	....
Romilly Schools (Jenner Road)	0706	0806	0906	1006	1106	1206	1306	1406	1506	1606	1706	....	....
Colcot Road (Barry College & Hospital)	0708	0808	0908	1008	1108	1208	1308	1408	1508	1608	1708	....	....
Weycock Cross	0711	0811	0911	1011	1111	1211	1311	1411	1511	1611	1711	....	....
Holiday Inn Express (Port Road for Airport)	0716	0816	0916	1016	1116	1216	1316	....	1516	1616	1716	....	....
Rhoose (Station Road) =	0720	0820	0920	1020	1120	1220	1320	....	1520	1620	1720	....	....
Fonmon Cross	....	0825	0925	1025	1125	1225	1325	....	1525	1625	1725	....	....
East Aberthaw (side of Blue Anchor)	0728	0828	0928	1028	1128	1228	1328	....	1528	1628	1728	....	....
St Athan Village	0735	0835	0935	1035	1135	1235	1335	1420	1535	1635	1735	....	....
Boverton (shops)	0742	0842	0942	1042	1142	1242	1342	1426	1542	1642	1742	....	....
Eagleswell Road	0743	0843	0943	1043	1143	1243	1343	1427	1543	1643	1743	....	....
Llantwit Major Interchange (arrive) =	0745	0845	0945	1045	1145	1245	1345	1429	1545	1645	1745	....	....

**X45 Additional Information - Gwybodaeth Ychwanegol:****CARDIFF AIRPORT**

Passengers travelling to/from Cardiff Airport should board or alight at the Holiday Inn Express bus stop located on Port Road; a 5 minute walk (approximately) from the Airport Terminal building.

**M-F**

These journeys run Mondays to Fridays only; not on Saturdays.

**a**

Service operates to Weston Square (Gladstone Road stops) ; timings at this location are approximate.

**b**

Service operates from Weston Square (Gladstone Road stops) ; timings at this location are approximate.

**=**

Rail Station within 5 minutes walk from this stop

**Bank Holidays**

No Bank Holiday service provision, except Good Friday when normal service provision will be provided.

**Bus Stopping Arrangements:**

Serves all recognised bus stops along the line of route.



**acstro**

Ymgynghorwyr Priffyrdd a Thrafnidiaeth  
Highways & Transportation Consultants

# Appendix 5



**Job Number** 3259-WAL  
**Client** Acstro  
**Project** St Athan  
**Location** 51.41387 -3.42061  
**Site No.** 1  
**Road** Cowbridge Road  
**Start Date** 08-Sep-16  
**Direction** Northbound

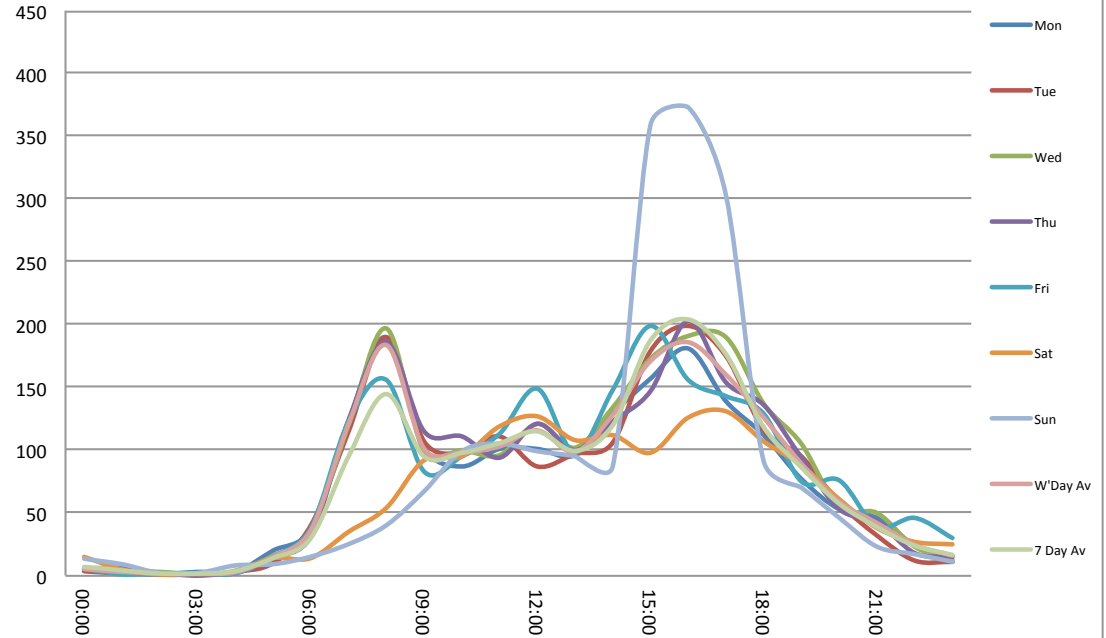
### Volume Summary

**Average Weekday** 1,888  
**7 Day Average** 1,844

Time	Day of Week							Ave W'day	7 Day Ave
	Mon 12-Sep	Tue 13-Sep	Wed 14-Sep	Thu 08-Sep	Fri 09-Sep	Sat 10-Sep	Sun 11-Sep		
<b>AM Peak</b>	190	190	197	186	156	119	105		
<b>PM Peak</b>	181	199	191	203	199	131	373		
00:00	3	4	5	6	6	15	13	5	7
01:00	2	2	4	6	1	5	9	3	4
02:00	1	2	3	1	2	1	2	2	2
03:00	3	0	1	1	2	2	2	1	2
04:00	3	3	4	2	2	3	8	3	4
05:00	20	10	16	14	15	14	9	15	14
06:00	37	40	35	31	38	14	15	36	30
07:00	123	115	120	124	123	35	25	121	95
08:00	190	190	197	186	156	54	40	184	145
09:00	102	107	99	115	83	92	67	101	95
10:00	87	98	100	111	95	95	99	98	98
11:00	101	111	96	94	113	119	105	103	106
12:00	101	87	121	121	149	127	99	116	115
13:00	96	97	102	100	98	108	95	99	99
14:00	129	106	134	123	148	112	87	128	120
15:00	157	179	173	147	199	98	359	171	187
16:00	181	199	191	203	156	126	373	186	204
17:00	139	175	190	154	143	131	303	160	176
18:00	112	116	137	136	129	107	91	126	118
19:00	77	95	105	94	75	88	70	89	86
20:00	53	58	54	53	76	61	46	59	57
21:00	46	32	50	43	39	38	23	42	39
22:00	24	12	23	18	46	27	17	25	24
23:00	11	11	13	15	30	25	11	16	17
<b>Total</b>	<b>1798</b>	<b>1849</b>	<b>1973</b>	<b>1898</b>	<b>1924</b>	<b>1497</b>	<b>1968</b>	<b>1888</b>	<b>1844</b>

07:00-19:00	1518	1580	1660	1614	1592	1204	1743	1593	1559
06:00-22:00	1731	1805	1904	1835	1820	1405	1897	1819	1771
06:00-24:00	1766	1828	1940	1868	1896	1457	1925	1860	1811
00:00-24:00	1798	1849	1973	1898	1924	1497	1968	1888	1844

**Hourly Volume Graph**  
 1. Cowbridge Road - 51.41387 -3.42061





**Job Number** 3259-WAL  
**Client** Acstro  
**Project** St Athan  
**Location** 51.41387 -3.42061  
**Site No.** 1  
**Road** Cowbridge Road  
**Start Date** 08-Sep-16  
**Direction** Southbound

### Volume Summary

**Average Weekday** 1,855  
**7 Day Average** 1,791

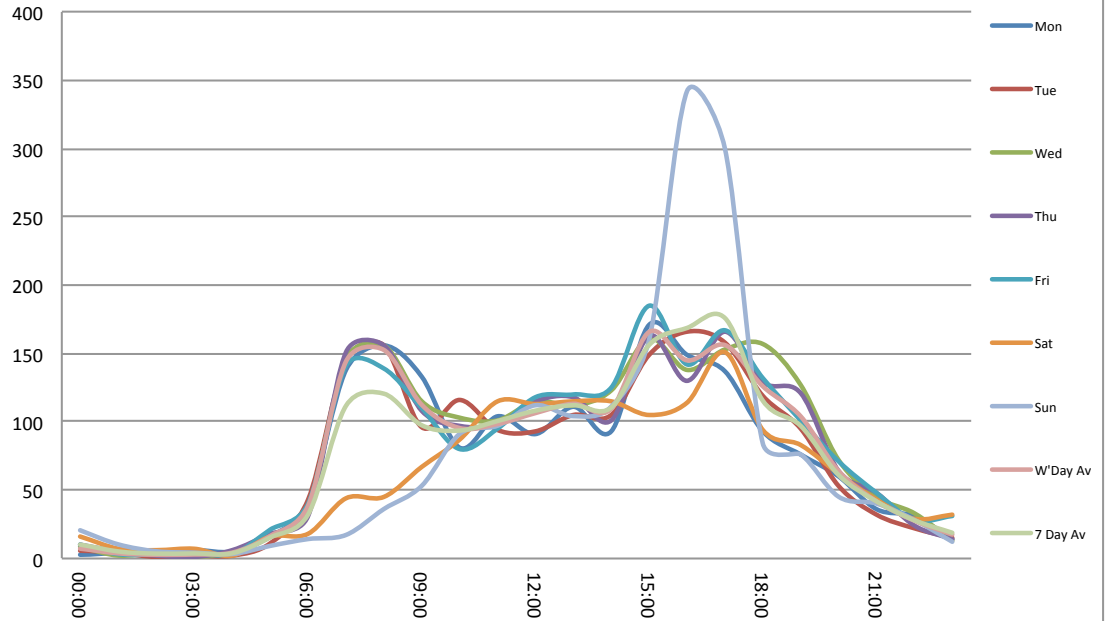
1. Cowbridge Road - 51.41387 -3.42061

Southbound

Time	Day of Week							Ave W'day	7 Day Ave
	Mon 12-Sep	Tue 13-Sep	Wed 14-Sep	Thu 08-Sep	Fri 09-Sep	Sat 10-Sep	Sun 11-Sep		
<b>AM Peak</b>	156	156	156	156	141	115	97		
<b>PM Peak</b>	171	166	161	166	185	151	342		
00:00	2	6	8	10	10	16	20	7	10
01:00	4	4	2	5	3	7	10	4	5
02:00	3	1	4	2	3	6	5	3	3
03:00	6	2	1	1	4	7	4	3	4
04:00	5	2	5	6	3	2	3	4	4
05:00	16	11	16	18	21	16	9	16	15
06:00	41	43	38	31	40	18	14	39	32
07:00	138	145	146	151	141	44	17	144	112
08:00	156	156	156	156	139	45	36	153	121
09:00	133	96	115	108	110	67	53	112	97
10:00	81	116	103	97	80	87	91	95	94
11:00	104	94	101	98	95	115	97	98	101
12:00	91	93	115	115	118	113	112	106	108
13:00	111	105	112	118	120	115	104	113	112
14:00	93	105	123	101	125	115	111	109	110
15:00	171	149	161	163	185	105	160	166	156
16:00	149	166	138	130	142	114	342	145	169
17:00	137	158	153	166	167	151	300	156	176
18:00	93	119	157	129	132	94	84	126	115
19:00	76	95	127	121	101	83	76	104	97
20:00	60	53	72	64	71	62	45	64	61
21:00	36	32	45	48	48	43	40	42	42
22:00	31	22	33	24	28	29	28	28	28
23:00	14	15	13	14	31	32	12	17	19
<b>Total</b>	<b>1751</b>	<b>1788</b>	<b>1944</b>	<b>1876</b>	<b>1917</b>	<b>1486</b>	<b>1773</b>	<b>1855</b>	<b>1791</b>

07:00-19:00	1457	1502	1580	1532	1554	1165	1507	1525	1471
06:00-22:00	1670	1725	1862	1796	1814	1371	1682	1773	1703
06:00-24:00	1715	1762	1908	1834	1873	1432	1722	1818	1749
00:00-24:00	1751	1788	1944	1876	1917	1486	1773	1855	1791

Hourly Volume Graph  
1. Cowbridge Road - 51.41387 -3.42061





**Job Number** 3259-WAL  
**Client** Acstro  
**Project** St Athan  
**Location** 51.41387 -3.42061  
**Site No.** 1  
**Road** Cowbridge Road  
**Start Date** 08-Sep-16  
**Direction** Combined

### Volume Summary

**Average Weekday** 3,744  
**7 Day Average** 3,635

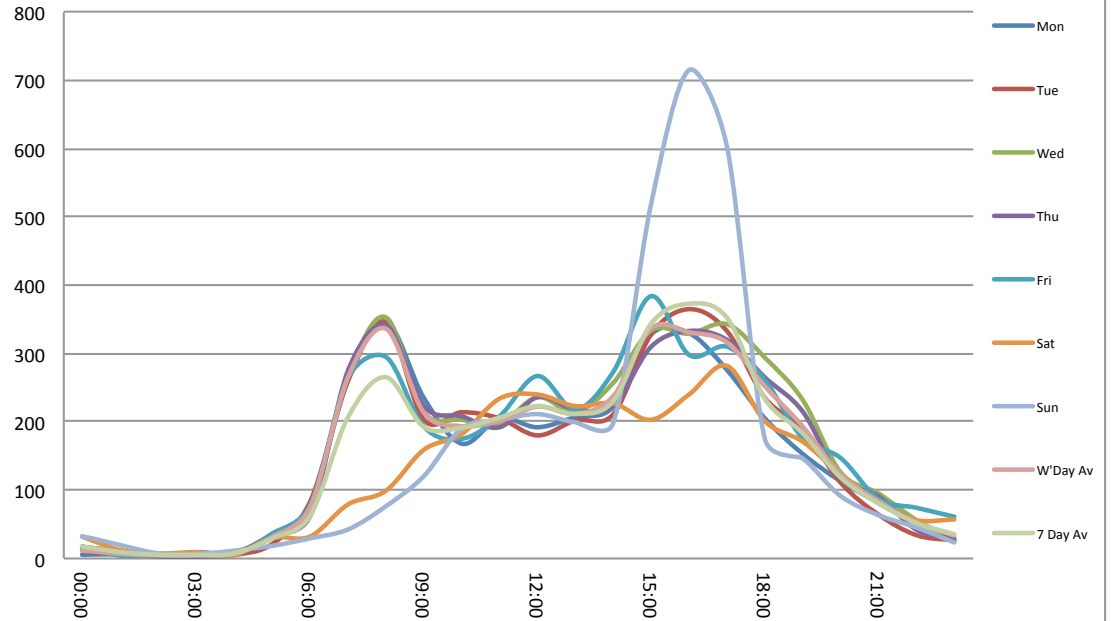
1. Cowbridge Road - 51.41387 -3.42061

Combined

Time	Day of Week							Ave W'day	7 Day Ave
	Mon 12-Sep	Tue 13-Sep	Wed 14-Sep	Thu 08-Sep	Fri 09-Sep	Sat 10-Sep	Sun 11-Sep		
<b>AM Peak</b>	<b>346</b>	<b>346</b>	<b>353</b>	<b>342</b>	<b>295</b>	<b>234</b>	<b>202</b>		
<b>PM Peak</b>	<b>330</b>	<b>365</b>	<b>343</b>	<b>333</b>	<b>384</b>	<b>282</b>	<b>715</b>		
00:00	5	10	13	16	16	31	33	12	18
01:00	6	6	6	11	4	12	19	7	9
02:00	4	3	7	3	5	7	7	4	5
03:00	9	2	2	2	6	9	6	4	5
04:00	8	5	9	8	5	5	11	7	7
05:00	36	21	32	32	36	30	18	31	29
06:00	78	83	73	62	78	32	29	75	62
07:00	261	260	266	275	264	79	42	265	207
08:00	346	346	353	342	295	99	76	336	265
09:00	235	203	214	223	193	159	120	214	192
10:00	168	214	203	208	175	182	190	194	191
11:00	205	205	197	192	208	234	202	201	206
12:00	192	180	236	236	267	240	211	222	223
13:00	207	202	214	218	218	223	199	212	212
14:00	222	211	257	224	273	227	198	237	230
15:00	328	328	334	310	384	203	519	337	344
16:00	330	365	329	333	298	240	715	331	373
17:00	276	333	343	320	310	282	603	316	352
18:00	205	235	294	265	261	201	175	252	234
19:00	153	190	232	215	176	171	146	193	183
20:00	113	111	126	117	147	123	91	123	118
21:00	82	64	95	91	87	81	63	84	80
22:00	55	34	56	42	74	56	45	52	52
23:00	25	26	26	29	61	57	23	33	35
<b>Total</b>	<b>3549</b>	<b>3637</b>	<b>3917</b>	<b>3774</b>	<b>3841</b>	<b>2983</b>	<b>3741</b>	<b>3744</b>	<b>3635</b>

07:00-19:00	2975	3082	3240	3146	3146	2369	3250	3118	3030
06:00-22:00	3401	3530	3766	3631	3634	2776	3579	3592	3474
06:00-24:00	3481	3590	3848	3702	3769	2889	3647	3678	3561
00:00-24:00	3549	3637	3917	3774	3841	2983	3741	3744	3635

Hourly Volume Graph  
1. Cowbridge Road - 51.41387 -3.42061







**acstro**

Ymgynghorwyr Priffyrdd a Thrafnidiaeth  
Highways & Transportation Consultants

# Appendix 6

Entry : Arm A - St Athan Road

	Destination : Arm A - St Athan Road								Destination : Arm B - Cowbridge Road								Destination : Arm C - Unnamed Road								Arm Totals	
	CAR	LGV	OGV1	OGV2	BUS	MC	PC	Total	CAR	LGV	OGV1	OGV2	BUS	MC	PC	Total	CAR	LGV	OGV1	OGV2	BUS	MC	PC	Total		
07:00	0	0	0	0	0	0	0	0	7	1	1	0	0	0	4	13	0	0	0	0	0	0	0	0	13	
07:15	0	0	0	0	0	0	0	0	19	3	0	0	0	0	1	23	1	1	0	0	0	0	0	0	25	
07:30	0	0	0	0	0	0	0	0	14	4	0	0	0	1	0	19	1	0	0	0	0	0	0	0	20	
07:45	0	0	0	0	0	0	0	0	16	4	0	0	0	0	1	21	2	0	0	0	0	0	0	0	23	
1 Hr	0	0	0	0	0	0	0	0	56	12	1	0	0	1	6	76	4	1	0	0	0	0	0	0	81	
08:00	0	0	0	0	0	0	0	0	22	4	0	0	0	0	0	26	4	2	0	0	0	0	0	0	32	
08:15	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	10	5	0	0	0	0	0	0	0	15	
08:30	0	0	0	0	0	0	0	0	19	0	0	0	0	0	0	19	2	0	0	0	0	0	0	0	21	
08:45	0	0	0	0	0	0	0	0	9	4	1	0	0	0	0	14	7	0	0	0	0	0	0	0	21	
1 Hr	0	0	0	0	0	0	0	0	60	8	1	0	0	0	0	69	18	2	0	0	0	0	0	0	89	
09:00	0	0	0	0	0	0	0	0	9	5	1	1	0	0	0	16	2	2	0	0	0	0	0	0	20	
09:15	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0	11	1	0	0	0	0	0	0	0	12	
09:30	0	0	0	0	0	0	0	0	11	1	1	0	0	0	2	15	1	1	0	0	0	0	0	0	17	
09:45	0	0	0	0	0	0	0	0	4	1	1	1	0	0	0	7	1	2	0	0	0	0	0	0	10	
1 Hr	0	0	0	0	0	0	0	0	35	7	3	2	0	0	2	49	5	5	0	0	0	0	0	0	59	
3 Hrs	0	0	0	0	0	0	0	0	151	27	5	2	0	1	8	194	27	8	0	0	0	0	0	0	35	229

Entry : Arm A - St Athan Road

	Destination : Arm A - St Athan Road								Destination : Arm B - Cowbridge Road								Destination : Arm C - Unnamed Road								Arm Totals	
	CAR	LGV	OGV1	OGV2	BUS	MC	PC	Total	CAR	LGV	OGV1	OGV2	BUS	MC	PC	Total	CAR	LGV	OGV1	OGV2	BUS	MC	PC	Total		
15:00	0	0	0	0	0	0	0	0	14	3	0	1	0	1	0	19	5	0	0	0	0	0	0	0	5	24
15:15	0	0	0	0	0	0	0	0	13	3	0	0	0	0	0	16	8	1	0	0	0	0	0	0	9	25
15:30	0	0	0	0	0	0	0	0	22	4	0	0	0	0	0	26	7	1	0	0	0	0	0	0	8	34
15:45	0	0	0	0	0	0	0	0	8	3	0	0	0	0	0	11	5	0	0	0	0	0	0	0	5	16
1 Hr	0	0	0	0	0	0	0	0	57	13	0	1	0	1	0	72	25	2	0	0	0	0	0	0	27	99
16:00	0	0	0	0	0	0	0	0	13	1	0	0	0	2	0	16	7	0	0	0	0	0	0	0	7	23
16:15	0	0	0	0	0	0	0	0	9	2	0	0	0	0	0	11	4	1	0	0	0	0	0	0	5	16
16:30	0	0	0	0	0	0	0	0	13	2	0	0	0	0	0	15	3	1	0	0	0	1	0	0	5	20
16:45	0	0	0	0	0	0	0	0	13	3	0	0	0	0	0	16	2	2	0	0	0	0	0	0	4	20
1 Hr	0	0	0	0	0	0	0	0	48	8	0	0	0	2	0	58	16	4	0	0	0	1	0	0	21	79
17:00	0	0	0	0	0	0	0	0	18	1	0	0	0	1	0	20	6	1	0	0	0	0	0	0	7	27
17:15	0	0	0	0	0	0	0	0	29	2	0	0	0	1	0	32	6	1	0	0	0	0	0	0	7	39
17:30	0	0	0	0	0	0	0	0	15	0	0	0	0	1	0	16	12	0	0	0	0	0	0	0	12	28
17:45	0	0	0	0	0	0	0	0	18	2	1	0	0	0	1	22	3	0	0	0	0	0	0	0	3	25
1 Hr	0	0	0	0	0	0	0	0	80	5	1	0	0	3	1	90	27	2	0	0	0	0	0	0	29	119
18:00	0	0	0	0	0	0	0	0	15	1	0	0	0	2	0	18	6	0	0	0	0	0	0	0	6	24
18:15	0	0	0	0	0	0	0	0	12	1	0	0	0	0	0	13	4	0	0	0	0	0	0	0	4	17
½ Hr	0	0	0	0	0	0	0	0	27	2	0	0	0	2	0	31	10	0	0	0	0	0	0	0	10	41
3½ Hrs	0	0	0	0	0	0	0	0	212	28	1	1	0	8	1	251	78	8	0	0	0	1	0	0	87	338
Total	0	0	0	0	0	0	0	0	363	55	6	3	0	9	9	445	105	16	0	0	0	1	0	0	122	567



Check 0 445 122 567  
Entry : Arm B - Cowbridge Road

	Destination : Arm A - St Athan Road								Destination : Arm B - Cowbridge Road								Destination : Arm C - Unnamed Road								Arm Totals
	CAR	LGV	OGV1	OGV2	BUS	MC	PC	Total	CAR	LGV	OGV1	OGV2	BUS	MC	PC	Total	CAR	LGV	OGV1	OGV2	BUS	MC	PC	Total	
07:00	14	3	0	0	0	0	0	17	0	0	0	0	0	0	0	0	4	1	1	0	1	0	0	7	24
07:15	15	1	0	0	0	0	0	16	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	8	24
07:30	17	2	1	0	0	0	0	20	0	0	0	0	0	0	0	0	12	1	0	0	2	0	0	15	35
07:45	24	1	0	0	0	0	0	25	0	0	0	0	0	0	0	0	13	2	0	0	3	0	0	18	43
1 Hr	70	7	1	0	0	0	0	78	0	0	0	0	0	0	0	0	37	4	1	0	6	0	0	48	126
08:00	20	4	0	1	0	0	0	25	0	0	0	0	0	0	0	0	11	1	0	1	3	0	0	16	41
08:15	16	2	0	0	0	0	0	18	0	0	0	0	0	0	0	0	26	4	0	0	1	0	0	31	49
08:30	16	2	0	0	0	0	0	18	0	0	0	0	0	0	0	0	30	1	0	0	2	0	0	33	51
08:45	22	1	0	0	0	0	0	23	0	0	0	0	0	0	0	0	20	0	0	1	1	0	0	22	45
1 Hr	74	9	0	1	0	0	0	84	0	0	0	0	0	0	0	0	87	6	0	2	7	0	0	102	186
09:00	10	1	0	0	0	0	0	11	0	0	0	0	0	0	0	0	17	3	0	0	1	0	0	21	32
09:15	8	2	0	0	0	0	0	10	0	0	0	0	0	0	0	0	15	1	0	0	2	0	0	18	28
09:30	12	1	0	1	0	0	0	14	0	0	0	0	0	0	0	0	4	2	0	0	1	1	0	8	22
09:45	11	0	0	1	0	0	4	16	0	0	0	0	0	0	0	0	16	1	0	0	0	0	0	17	33
1 Hr	41	4	0	2	0	0	4	51	0	0	0	0	0	0	0	0	52	7	0	0	4	1	0	64	115
3 Hrs	185	20	1	3	0	0	4	213	0	0	0	0	0	0	0	0	176	17	1	2	17	1	0	214	427

	Destination : Arm A - St Athan Road								Destination : Arm B - Cowbridge Road								Destination : Arm C - Unnamed Road								Arm Totals
	CAR	LGV	OGV1	OGV2	BUS	MC	PC	Total	CAR	LGV	OGV1	OGV2	BUS	MC	PC	Total	CAR	LGV	OGV1	OGV2	BUS	MC	PC	Total	
15:00	20	0	1	0	0	0	1	22	0	0	0	0	0	0	0	0	17	2	0	0	0	0	1	20	42
15:15	20	0	0	0	0	0	1	21	0	0	0	0	0	0	0	0	9	2	0	0	2	2	0	15	36
15:30	9	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	29	1	0	0	1	0	0	31	40
15:45	11	1	0	0	0	0	1	13	0	0	0	0	0	0	0	0	13	1	1	0	3	0	0	18	31
1 Hr	60	1	1	0	0	2	1	65	0	0	0	0	0	0	0	0	68	6	1	0	6	2	1	84	149
16:00	16	4	0	0	0	1	0	21	0	0	0	0	0	0	0	0	18	1	0	0	1	0	0	20	41
16:15	17	5	0	0	0	0	0	22	0	0	0	0	0	0	0	0	25	1	0	0	1	0	0	27	49
16:30	27	4	0	0	0	2	0	33	0	0	0	0	0	0	0	0	34	2	0	0	1	0	3	40	73
16:45	12	1	0	0	0	0	1	14	0	0	0	0	0	0	0	0	29	2	0	0	0	1	0	32	46
1 Hr	72	14	0	0	0	3	1	90	0	0	0	0	0	0	0	0	106	6	0	0	3	1	3	119	209
17:00	13	2	0	0	0	1	0	16	0	0	0	0	0	0	0	0	27	2	0	0	0	0	0	29	45
17:15	20	3	0	0	0	1	0	24	0	0	0	0	0	0	0	0	16	0	0	0	1	0	0	17	41
17:30	10	3	0	0	0	2	0	15	0	0	0	0	0	0	0	0	19	1	0	0	2	1	0	23	38
17:45	4	1	0	0	0	0	0	5	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	20	25
1 Hr	47	9	0	0	0	4	0	60	0	0	0	0	0	0	0	0	82	3	0	0	3	1	0	89	149
18:00	16	2	0	0	0	2	0	20	0	0	0	0	0	0	0	0	18	2	0	0	0	0	0	20	40
18:15	10	1	0	0	0	1	0	12	0	0	0	0	0	0	0	0	14	2	0	0	2	1	1	20	32
½ Hr	26	3	0	0	0	3	0	32	0	0	0	0	0	0	0	0	32	4	0	0	2	1	1	40	72
3½ Hrs	205	27	1	0	0	12	2	247	0	0	0	0	0	0	0	0	288	19	1	0	14	5	5	332	579
Total	390	47	2	3	0	12	6	460	0	0	0	0	0	0	0	0	464	36	2	2	31	6	5	546	1006

Entry : Arm C - Unnamed Road

	Destination : Arm A - St Athan Road								Total	Destination : Arm B - Cowbridge Road								Total	Destination : Arm C - Unnamed Road								Total	Arm Totals
	CAR	LGV	OGV1	OGV2	BUS	MC	PC			CAR	LGV	OGV1	OGV2	BUS	MC	PC			CAR	LGV	OGV1	OGV2	BUS	MC	PC			
07:00	2	1	0	0	0	0	0	3	16	0	0	0	0	0	0	16	0	0	0	0	0	0	0	0	19			
07:15	5	0	0	0	0	0	0	5	15	0	1	0	1	1	0	18	0	0	0	0	0	0	0	0	23			
07:30	5	1	0	0	0	0	0	6	17	1	0	0	2	0	20	0	0	0	0	0	0	0	0	0	26			
07:45	16	0	0	0	0	0	0	16	24	0	0	0	0	0	24	0	0	0	0	0	0	0	0	0	40			
1 Hr	28	2	0	0	0	0	0	30	72	1	1	0	3	1	78	0	0	0	0	0	0	0	0	0	108			
08:00	11	0	0	0	0	0	0	11	14	0	0	0	1	0	15	0	0	0	0	0	0	0	0	0	26			
08:15	7	0	0	0	0	0	0	7	25	4	1	0	2	0	32	0	0	0	0	0	0	0	0	0	39			
08:30	4	0	0	0	0	0	0	4	24	3	0	0	1	0	28	0	0	0	0	0	0	0	0	0	32			
08:45	5	0	0	0	0	0	0	5	7	4	0	0	0	0	11	0	0	0	0	0	0	0	0	0	16			
1 Hr	27	0	0	0	0	0	0	27	70	11	1	0	4	0	86	0	0	0	0	0	0	0	0	0	113			
09:00	2	0	0	0	0	0	0	2	17	0	0	0	0	0	17	0	0	0	0	0	0	0	0	0	19			
09:15	0	1	0	0	0	0	0	1	15	2	0	0	0	0	17	0	0	0	0	0	0	0	0	0	18			
09:30	0	1	0	0	0	0	0	1	6	4	1	0	1	0	12	0	0	0	0	0	0	0	0	0	13			
09:45	2	0	0	0	0	0	0	2	12	1	1	0	1	0	15	0	0	0	0	0	0	0	0	0	17			
1 Hr	4	2	0	0	0	0	0	6	50	7	2	0	2	0	61	0	0	0	0	0	0	0	0	0	67			
3 Hrs	59	4	0	0	0	0	0	63	192	19	4	0	9	1	225	0	0	0	0	0	0	0	0	0	288			

Entry : Arm C - Unnamed Road

	Destination : Arm A - St Athan Road								Total	Destination : Arm B - Cowbridge Road								Total	Destination : Arm C - Unnamed Road								Total	Arm Totals
	CAR	LGV	OGV1	OGV2	BUS	MC	PC			CAR	LGV	OGV1	OGV2	BUS	MC	PC			CAR	LGV	OGV1	OGV2	BUS	MC	PC			
15:00	4	0	0	0	0	0	0	4	22	1	0	0	0	1	24	0	0	0	0	0	0	0	0	0	28			
15:15	4	0	0	0	0	0	0	4	13	1	0	0	4	0	18	0	0	0	0	0	0	0	0	0	22			
15:30	2	1	0	0	0	0	0	3	26	1	0	0	0	0	28	0	0	0	0	0	0	0	0	0	31			
15:45	2	0	0	0	0	0	0	2	22	0	0	0	3	0	25	0	0	0	0	0	0	0	0	0	27			
1 Hr	12	1	0	0	0	0	0	13	83	3	0	0	7	1	95	0	0	0	0	0	0	0	0	0	108			
16:00	2	0	0	0	0	0	0	2	20	3	1	0	1	0	25	0	0	0	0	0	0	0	0	0	27			
16:15	3	0	0	0	0	0	0	3	12	3	0	0	0	1	16	0	0	0	0	0	0	0	0	0	19			
16:30	2	3	0	0	0	0	0	5	16	0	0	0	1	1	19	0	0	0	0	0	0	0	0	0	24			
16:45	2	1	0	0	0	0	0	3	14	1	0	0	0	0	15	0	0	0	0	0	0	0	0	0	18			
1 Hr	9	4	0	0	0	0	0	13	62	7	1	0	2	2	75	0	0	0	0	0	0	0	0	0	88			
17:00	5	0	0	0	0	0	0	5	12	2	0	0	0	0	14	0	0	0	0	0	0	0	0	0	19			
17:15	2	0	0	0	0	0	0	2	10	3	0	0	1	0	14	0	0	0	0	0	0	0	0	0	16			
17:30	1	0	0	0	0	0	0	1	25	2	0	0	1	0	31	0	0	0	0	0	0	0	0	0	32			
17:45	1	0	0	0	0	0	0	1	24	1	0	0	0	1	26	0	0	0	0	0	0	0	0	0	27			
1 Hr	9	0	0	0	0	0	0	9	71	8	0	0	2	1	85	0	0	0	0	0	0	0	0	0	94			
18:00	3	0	0	0	0	1	0	4	20	1	0	0	1	0	22	0	0	0	0	0	0	0	0	0	26			
18:15	1	0	0	0	0	0	0	1	15	1	0	0	0	0	16	0	0	0	0	0	0	0	0	0	17			
½ Hr	4	0	0	0	0	1	0	5	35	2	0	0	1	0	38	0	0	0	0	0	0	0	0	0	43			
3½ Hrs	34	5	0	0	0	1	0	40	251	20	1	0	12	4	293	0	0	0	0	0	0	0	0	0	333			
Total	93	9	0	0	0	1	0	103	443	39	5	0	21	5	518	0	0	0	0	0	0	0	0	0	621			

ORIGIN SUMMARY

	Origin : Arm A - St Athan Road								Total	Origin : Arm B - Cowbridge Road								Total	Origin : Arm C - Unnamed Road								Total	Origin Totals
	CAR	LGV	OGV1	OGV2	BUS	MC	PC			CAR	LGV	OGV1	OGV2	BUS	MC	PC			CAR	LGV	OGV1	OGV2	BUS	MC	PC			
07:00	7	1	1	0	0	0	0	4	13	18	4	1	0	1	0	0	24	18	1	0	0	0	0	0	19	56		
07:15	20	4	0	0	0	0	0	1	25	23	1	0	0	0	0	0	24	20	0	1	0	1	1	0	23	72		
07:30	15	4	0	0	0	0	1	0	20	29	3	1	0	2	0	0	35	22	2	0	0	2	0	0	26	81		
07:45	18	4	0	0	0	0	0	1	23	37	3	0	0	3	0	0	43	40	0	0	0	0	0	0	40	106		
1 Hr	60	13	1	0	0	0	1	6	81	107	11	2	0	6	0	0	126	100	3	1	0	3	1	0	108	315		
08:00	26	6	0	0	0	0	0	0	32	31	5	0	2	3	0	0	41	25	0	0	0	1	0	0	26	99		
08:15	15	0	0	0	0	0	0	0	15	42	6	0	0	1	0	0	49	32	4	1	0	2	0	0	39	103		
08:30	21	0	0	0	0	0	0	0	21	46	3	0	0	2	0	0	51	28	3	0	0	1	0	0	32	104		
08:45	16	4	1	0	0	0	0	0	21	42	1	0	1	1	0	0	45	12	4	0	0	0	0	0	16	82		
1 Hr	78	10	1	0	0	0	0	0	89	161	15	0	3	7	0	0	186	97	11	1	0	4	0	0	113	388		
09:00	11	7	1	1	0	0	0	0	20	27	4	0	0	1	0	0	32	19	0	0	0	0	0	0	19	71		
09:15	12	0	0	0	0	0	0	0	12	23	3	0	0	2	0	0	28	15	3	0	0	0	0	0	18	58		
09:30	12	2	1	0	0	0	2	1	17	16	3	0	1	1	1	0	22	6	5	1	0	1	0	0	13	52		
09:45	5	3	1	1	0	0	0	0	10	27	1	0	1	0	0	4	33	14	1	1	0	1	0	0	17	60		
1 Hr	40	12	3	2	0	0	2	5	59	93	11	0	2	4	1	4	115	54	9	2	0	2	0	0	67	241		
3 Hrs	178	35	5	2	0	1	8	229	361	37	2	5	17	1	4	427	251	23	4	0	9	1	0	288	944			

ORIGIN SUMMARY

	Origin : Arm A - St Athan Road								Total	Origin : Arm B - Cowbridge Road								Total	Origin : Arm C - Unnamed Road								Total	Origin Totals
	CAR	LGV	OGV1	OGV2	BUS	MC	PC			CAR	LGV	OGV1	OGV2	BUS	MC	PC			CAR	LGV	OGV1	OGV2	BUS	MC	PC			
15:00	19	3	0	1	0	1	0	0	24	37	2	1	0	0	0	2	42	26	1	0	0	0	1	0	28	94		
15:15	21	4	0	0	0	0	0	0	25	29	2	0	0	2	3	0	36	17	1	0	0	4	0	0	22	83		
15:30	29	5	0	0	0	0	0	0	34	38	1	0	0	1	0	0	40	28	2	0	0	0	0	1	31	105		
15:45	13	3	0	0	0	0	0	0	16	24	2	1	0	3	1	0	31	24	0	0	0	3	0	0	27	74		
1 Hr	82	15	0	1	0	1	0	0	99	128	7	2	0	6	4	2	149	95	4	0	0	7	1	1	108	356		
16:00	20	1	0	0	0	2	0	0	23	34	5	0	0	1	1	0	41	22	3	1	0	1	0	0	27	91		
16:15	13	3	0	0	0	0	0	0	16	42	6	0	0	1	0	0	49	15	3	0	0	0	1	0	19	84		
16:30	16	3	0	0	0	1	0	0	20	61	6	0	0	1	2	3	73	18	3	0	0	1	1	1	24	117		
16:45	15	5	0	0	0	0	0	0	20	41	3	0	0	0	1	1	46	16	2	0	0	0	0	0	18	84		
1 Hr	64	12	0	0	0	3	0	0	79	178	20	0	0	3	4	4	209	71	11	1	0	2	2	1	88	376		
17:00	24	2	0	0	0	1	0	0	27	40	4	0	0	0	1	0	45	17	2	0	0	0	0	0	19	91		
17:15	35	3	0	0	0	1	0	0	39	36	3	0	0	1	1	0	41	12	3	0	0	1	0	0	16	96		
17:30	27	0	0	0	0	1	0	0	28	29	4	0	0	2	3	0	38	26	2	0	0	1	0	3	32	98		
17:45	21	2	1	0	0	0	1	0	25	24	1	0	0	0	0	0	25	25	1	0	0	0	1	0	27	77		
1 Hr	107	7	1	0	0	3	1	1	119	129	12	0	0	3	5	0	149	80	8	0	0	2	1	3	94	362		
18:00	21	1	0	0	0	2	0	0	24	34	4	0	0	0	2	0	40	23	1	0	0	1	1	0	26	90		
18:15	16	1	0	0	0	0	0	0	17	24	3	0	0	2	2	1	32	16	1	0	0	0	0	0	17	66		
½ Hr	37	2	0	0	0	2	0	0	41	58	7	0	0	2	4	1	72	39	2	0	0	1	1	0	43	156		
3½ Hrs	290	36	1	1	0	9	1	338	493	46	2	0	14	17	7	579	285	25	1	0	12	5	5	333	1250			
Total	468	71	6	3	0	10	9	567	854	83	4	5	31	18	11	1006	536	48	5	0	21	6	5	621	2194			

DESTINATION SUMMARY

	Destination : Arm A - St Athan Road								Total	Destination : Arm B - Cowbridge Road								Total	Destination : Arm C - Unnamed Road								Total	Dest Totals
	CAR	LGV	OGV1	OGV2	BUS	MC	PC			CAR	LGV	OGV1	OGV2	BUS	MC	PC			CAR	LGV	OGV1	OGV2	BUS	MC	PC			
07:00	16	4	0	0	0	0	0	20	23	1	1	0	0	0	4	29	4	1	1	0	1	0	0	7	56			
07:15	20	1	0	0	0	0	0	21	34	3	1	0	1	1	1	41	9	1	0	0	0	0	0	10	72			
07:30	22	3	1	0	0	0	0	26	31	5	0	0	2	1	0	39	13	1	0	0	2	0	0	16	81			
07:45	40	1	0	0	0	0	0	41	40	4	0	0	0	0	1	45	15	2	0	0	3	0	0	20	106			
1 Hr	98	9	1	0	0	0	0	108	128	13	2	0	3	2	6	154	41	5	1	0	6	0	0	53	315			
08:00	31	4	0	1	0	0	0	36	36	4	0	0	1	0	0	41	15	3	0	1	3	0	0	22	99			
08:15	23	2	0	0	0	0	0	25	35	4	1	0	2	0	0	42	31	4	0	0	1	0	0	36	103			
08:30	20	2	0	0	0	0	0	22	43	3	0	0	1	0	0	47	32	1	0	0	2	0	0	35	104			
08:45	27	1	0	0	0	0	0	28	16	8	1	0	0	0	0	25	27	0	0	1	1	0	0	29	82			
1 Hr	101	9	0	1	0	0	0	111	130	19	2	0	4	0	0	155	105	8	0	2	7	0	0	122	388			
09:00	12	1	0	0	0	0	0	13	26	5	1	1	0	0	0	33	19	5	0	0	1	0	0	25	71			
09:15	8	3	0	0	0	0	0	11	26	2	0	0	0	0	0	28	16	1	0	0	2	0	0	19	58			
09:30	12	2	0	1	0	0	0	15	17	5	2	0	1	0	2	27	5	3	0	0	1	1	0	10	52			
09:45	13	0	0	1	0	0	4	18	16	2	2	1	1	0	0	22	17	3	0	0	0	0	0	20	60			
1 Hr	45	6	0	2	0	0	4	57	85	14	5	2	2	0	2	110	57	12	0	0	4	1	0	74	241			
3 Hrs	244	24	1	3	0	0	4	276	343	46	9	2	9	2	8	419	203	25	1	2	17	1	0	249	944			

DESTINATION SUMMARY

	Destination : Arm A - St Athan Road								Total	Destination : Arm B - Cowbridge Road								Total	Destination : Arm C - Unnamed Road								Total	Dest Totals
	CAR	LGV	OGV1	OGV2	BUS	MC	PC			CAR	LGV	OGV1	OGV2	BUS	MC	PC			CAR	LGV	OGV1	OGV2	BUS	MC	PC			
15:00	24	0	1	0	0	0	1	26	36	4	0	1	0	2	0	43	22	2	0	0	0	0	1	25	94			
15:15	24	0	0	0	0	1	0	25	26	4	0	0	4	0	0	34	17	3	0	0	2	2	0	24	83			
15:30	11	1	0	0	0	0	0	12	48	5	0	0	0	0	1	54	36	2	0	0	1	0	0	39	105			
15:45	13	1	0	0	0	1	0	15	30	3	0	0	3	0	0	36	18	1	1	0	3	0	0	23	74			
1 Hr	72	2	1	0	0	2	1	78	140	16	0	1	7	2	1	167	93	8	1	0	6	2	1	111	356			
16:00	18	4	0	0	0	1	0	23	33	4	1	0	1	2	0	41	25	1	0	0	1	0	0	27	91			
16:15	20	5	0	0	0	0	0	25	21	5	0	0	0	1	0	27	29	2	0	0	1	0	0	32	84			
16:30	29	7	0	0	0	2	0	38	29	2	0	0	1	1	1	34	37	3	0	0	1	1	3	45	117			
16:45	14	2	0	0	0	0	1	17	27	4	0	0	0	0	0	31	31	4	0	0	0	1	0	36	84			
1 Hr	81	18	0	0	0	3	1	103	110	15	1	0	2	4	1	133	122	10	0	0	3	2	3	140	376			
17:00	18	2	0	0	0	1	0	21	30	3	0	0	0	1	0	34	33	3	0	0	0	0	0	36	91			
17:15	22	3	0	0	0	1	0	26	39	5	0	0	1	1	0	46	22	1	0	0	1	0	0	24	96			
17:30	11	3	0	0	0	2	0	16	40	2	0	0	1	1	3	47	31	1	0	0	2	1	0	35	98			
17:45	5	1	0	0	0	0	0	6	42	3	1	0	0	1	1	48	23	0	0	0	0	0	0	23	77			
1 Hr	56	9	0	0	0	4	0	69	151	13	1	0	2	4	4	175	109	5	0	0	3	1	0	118	362			
18:00	19	2	0	0	0	3	0	24	35	2	0	0	1	2	0	40	24	2	0	0	0	0	0	26	90			
18:15	11	1	0	0	0	1	0	13	27	2	0	0	0	0	0	29	18	2	0	0	2	1	1	24	66			
½ Hr	30	3	0	0	0	4	0	37	62	4	0	0	1	2	0	69	42	4	0	0	2	1	1	50	156			
3½ Hrs	239	32	1	0	0	13	2	287	463	48	2	1	12	12	6	544	366	27	1	0	14	6	5	419	1250			
Total	483	56	2	3	0	13	6	563	806	94	11	3	21	14	14	963	569	52	2	2	31	7	5	668	2194			



Check 0 949 36 229 1214

Entry : Arm B - B4265 (E)

	Destination : Arm A - Gileston Road (N)								Destination : Arm B - B4265 (E)								Destination : Arm C - Gileston Road (S)								Destination : Arm D - B4265 (W)								Arm Totals
	CAR	LGV	OGV1	OGV2	BUS	MC	PC	Total	CAR	LGV	OGV1	OGV2	BUS	MC	PC	Total	CAR	LGV	OGV1	OGV2	BUS	MC	PC	Total	CAR	LGV	OGV1	OGV2	BUS	MC	PC	Total	
07:00	9	3	1	0	1	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	5	0	1	0	1	0	40	54
07:15	20	1	0	0	1	0	1	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	9	0	3	0	0	0	48	71
07:30	22	1	1	0	0	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	71	7	1	1	0	0	0	80	105
07:45	21	5	0	0	5	0	0	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57	8	1	2	0	1	0	69	101
1 Hr	72	10	2	0	7	0	1	92	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	197	29	2	7	0	2	0	237	331
08:00	34	5	0	1	0	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	59	10	2	4	1	2	0	78	119	
08:15	20	4	0	0	2	1	0	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	63	11	0	3	2	0	0	79	106
08:30	16	7	1	0	0	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49	8	1	0	0	1	0	59	83
08:45	18	4	2	1	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	47	12	0	3	0	0	0	62	88	
1 Hr	88	20	3	2	2	1	0	116	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	218	41	3	10	3	3	0	278	396	
09:00	25	7	1	0	2	0	0	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45	9	3	3	1	1	0	62	97	
09:15	20	5	2	0	2	0	0	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	7	2	1	0	0	0	43	72	
09:30	15	5	2	2	0	0	4	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	8	1	2	0	1	0	49	77	
09:45	17	2	2	1	0	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	45	9	2	4	0	0	0	60	83	
1 Hr	77	19	7	3	4	0	4	114	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	160	33	8	10	1	2	0	214	329	
3 Hrs	237	49	12	5	13	1	5	322	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	575	103	13	27	4	7	0	729	1056	

Entry : Arm B - B4265 (E)

	Destination : Arm A - Gileston Road (N)								Destination : Arm B - B4265 (E)								Destination : Arm C - Gileston Road (S)								Destination : Arm D - B4265 (W)								Arm Totals
	CAR	LGV	OGV1	OGV2	BUS	MC	PC	Total	CAR	LGV	OGV1	OGV2	BUS	MC	PC	Total	CAR	LGV	OGV1	OGV2	BUS	MC	PC	Total	CAR	LGV	OGV1	OGV2	BUS	MC	PC	Total	
15:00	28	4	1	0	0	0	0	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	60	9	2	3	0	0	1	75	110	
15:15	30	2	0	0	2	2	0	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	81	7	1	3	0	1	0	93	131	
15:30	24	6	0	0	2	0	0	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	64	8	1	0	2	0	0	75	111	
15:45	26	1	0	0	2	0	0	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	69	8	0	0	2	1	0	80	110	
1 Hr	108	13	1	0	6	2	0	130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	274	32	4	6	4	2	1	323	462	
16:00	29	10	0	0	0	0	0	39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	71	13	2	0	1	2	0	89	131	
16:15	44	3	0	0	2	1	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	80	6	1	3	0	2	0	92	142	
16:30	39	8	0	0	0	1	0	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	71	9	0	1	0	0	0	81	131	
16:45	36	9	0	0	0	1	1	47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	53	7	0	2	0	0	0	62	111	
1 Hr	148	30	0	0	2	3	1	184	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	275	35	3	6	1	4	0	324	515	
17:00	48	6	0	0	0	0	0	54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	79	4	2	1	0	0	0	86	144	
17:15	39	4	0	0	0	3	0	46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	78	6	1	1	0	3	1	90	137	
17:30	35	4	0	0	2	0	0	41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	79	3	1	0	1	1	0	85	126	
17:45	41	7	0	0	0	0	0	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	79	8	1	1	0	0	0	89	137	
1 Hr	163	21	0	0	2	3	0	189	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	315	21	5	3	1	4	1	350	544	
18:00	40	4	0	0	0	0	2	46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	70	7	1	0	0	2	0	80	127	
18:15	33	1	0	0	2	0	0	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	45	6	0	0	2	1	1	55	92	
½ Hr	73	5	0	0	2	0	2	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	115	13	1	0	2	3	1	135	219	
3½ Hrs	492	69	1	0	12	8	3	585	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	979	101	13	15	8	13	3	1132	1740	
Total	729	118	13	5	25	9	8	907	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28	1554	204	26	42	12	20	3	1861	2796	







Check 247 1942 30 0 2219

**ORIGIN SUMMARY**

	Origin : Arm A - Gileston Road (N)								Origin : Arm B - B4265 (E)								Origin : Arm C - Gileston Road (S)								Origin : Arm D - B4265 (W)								Origin Totals
	CAR	LGV	OGV1	OGV2	BUS	MC	PC	Total	CAR	LGV	OGV1	OGV2	BUS	MC	PC	Total	CAR	LGV	OGV1	OGV2	BUS	MC	PC	Total	CAR	LGV	OGV1	OGV2	BUS	MC	PC	Total	
07:00	37	7	1	0	1	1	4	51	42	8	1	1	1	1	0	54	1	0	0	0	0	0	0	1	30	4	2	0	1	0	1	38	144
07:15	44	8	0	0	1	0	1	54	56	10	0	3	1	0	1	71	3	0	0	0	0	0	0	3	42	10	1	2	1	2	0	58	186
07:30	43	4	2	0	2	0	0	51	94	8	2	1	0	0	0	105	3	0	1	0	0	0	0	4	85	14	0	3	3	0	0	105	265
07:45	45	12	0	0	0	0	0	57	78	14	1	2	5	1	0	101	5	0	0	0	0	0	0	5	72	10	1	6	3	2	1	95	258
1 Hr	169	31	3	0	4	1	5	213	270	40	4	7	7	2	1	331	12	0	1	0	0	0	0	13	229	38	4	11	8	4	2	296	853
08:00	54	7	1	1	2	1	0	66	94	15	2	5	1	2	0	119	6	1	0	0	0	0	0	7	74	9	1	2	1	0	0	87	279
08:15	50	7	1	0	1	0	0	59	83	15	0	3	4	1	0	106	4	0	0	0	0	0	0	4	84	12	1	3	2	2	1	105	274
08:30	44	4	1	0	1	0	0	50	65	15	2	0	0	1	0	83	1	1	0	0	0	0	0	2	68	10	2	4	1	0	0	85	220
08:45	38	7	3	1	0	0	0	49	65	17	2	4	0	0	0	88	3	2	0	0	0	0	0	5	65	11	1	5	0	0	0	82	224
1 Hr	186	25	6	2	4	1	0	224	307	62	6	12	5	4	0	396	14	4	0	0	0	0	0	18	291	42	5	14	4	2	1	359	997
09:00	28	5	2	1	0	0	0	36	70	16	4	3	3	1	0	97	6	0	0	0	0	0	0	6	57	5	0	2	0	0	0	64	203
09:15	35	7	1	0	0	2	0	45	53	12	4	1	2	0	0	72	2	0	0	0	0	0	0	2	50	10	1	4	1	0	0	66	185
09:30	27	9	0	3	1	0	2	42	52	13	3	4	0	1	4	77	6	0	0	0	0	0	0	6	61	12	1	5	1	0	0	80	205
09:45	29	8	4	1	1	0	0	43	63	11	4	5	0	0	0	83	2	0	2	0	0	0	0	4	63	8	1	4	0	0	0	76	206
1 Hr	119	29	7	5	2	2	2	166	238	52	15	13	5	2	4	329	16	0	2	0	0	0	0	18	231	35	3	15	2	0	0	286	799
3 Hrs	474	85	16	7	10	4	7	603	815	154	25	32	17	8	5	1056	42	4	3	0	0	0	0	49	751	115	12	40	14	6	3	941	2649

**ORIGIN SUMMARY**

	Origin : Arm A - Gileston Road (N)								Origin : Arm B - B4265 (E)								Origin : Arm C - Gileston Road (S)								Origin : Arm D - B4265 (W)								Origin Totals
	CAR	LGV	OGV1	OGV2	BUS	MC	PC	Total	CAR	LGV	OGV1	OGV2	BUS	MC	PC	Total	CAR	LGV	OGV1	OGV2	BUS	MC	PC	Total	CAR	LGV	OGV1	OGV2	BUS	MC	PC	Total	
15:00	43	5	0	1	0	0	0	49	89	14	3	3	0	0	1	110	2	0	1	0	0	0	0	3	75	14	1	1	1	1	1	94	256
15:15	43	6	2	0	3	0	0	54	113	9	1	3	2	3	0	131	5	1	0	0	0	0	0	6	65	14	4	3	4	1	0	91	282
15:30	34	7	1	0	1	0	0	43	92	14	1	0	4	0	0	111	3	1	0	0	0	0	0	4	75	7	1	3	1	0	1	88	246
15:45	35	7	0	0	2	0	0	44	96	9	0	0	4	1	0	110	4	1	0	0	0	0	0	5	75	6	1	2	1	3	0	88	247
1 Hr	155	25	3	1	6	0	0	190	390	46	5	6	10	4	1	462	14	3	1	0	0	0	0	18	290	41	7	9	7	5	2	361	1031
16:00	38	5	0	1	1	0	1	46	102	24	2	0	1	2	0	131	2	1	0	0	0	0	0	3	79	11	0	3	0	0	0	93	273
16:15	35	8	0	1	1	0	0	45	124	9	1	3	2	3	0	142	1	1	0	0	0	0	0	2	75	10	2	3	0	1	0	91	280
16:30	34	9	0	0	1	0	1	45	112	17	0	1	0	1	0	131	4	0	0	0	0	0	0	4	83	20	1	2	1	1	0	108	288
16:45	21	2	0	1	0	1	0	25	91	16	0	2	0	1	1	111	3	0	0	0	0	0	0	3	71	8	0	1	0	0	1	81	220
1 Hr	128	24	0	3	3	1	2	161	429	66	3	6	3	7	1	515	10	2	0	0	0	0	0	12	308	49	3	9	1	2	1	373	1061
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17:15	32	3	0	0	1	0	0	36	118	10	1	1	0	6	1	137	5	0	0	0	0	0	0	5	86	9	1	0	0	3	0	99	277
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½ Hr	73	5	0	0	1	0	0	79	190	18	1	0	4	3	3	219	10	0	0	0	0	0	0	10	157	13	3	2	2	1	1	179	487

3½ Hrs	512	68	4	4	12	4	7	611	1492	172	14	15	20	21	6	1740	51	5	1	0	0	0	1	58	1068	139	15	23	11	18	4	1278	3687
Total	986	153	20	11	22	8	14	1214	2307	326	39	47	37	29	11	2796	93	9	4	0	0	0	1	107	1819	254	27	63	25	24	7	2219	6336

Check

1214

2796

107

2219

6336

DESTINATION SUMMARY

	Destination : Arm A - Gileston Road (N)							Total	Destination : Arm B - B4265 (E)							Total	Destination : Arm C - Gileston Road (S)							Total	Destination : Arm D - B4265 (W)							Total	Dest Totals	
	CAR	LGV	OGV1	OGV2	BUS	MC	PC		CAR	LGV	OGV1	OGV2	BUS	MC	PC		CAR	LGV	OGV1	OGV2	BUS	MC	PC		CAR	LGV	OGV1	OGV2	BUS	MC	PC			
07:00	10	3	3	0	2	0	0	18	63	10	0	0	1	0	5	79	0	0	1	0	0	0	0	0	0	37	6	0	1	0	2	0	46	144
07:15	24	2	0	1	2	1	1	31	79	14	1	1	1	1	1	98	1	0	0	0	0	0	0	1	41	12	0	3	0	0	0	56	186	
07:30	28	5	1	0	0	0	0	34	116	14	2	3	5	0	140	2	0	0	0	0	0	0	2	79	7	2	1	0	0	0	89	265		
07:45	28	6	0	0	6	0	0	40	99	18	1	6	2	2	129	1	1	0	0	0	0	0	2	72	11	1	2	0	1	0	87	258		
1 Hr	90	16	4	1	10	1	1	123	357	56	4	10	9	3	446	4	1	1	0	0	0	0	6	229	36	3	7	0	3	0	278	853		
08:00	41	5	1	1	1	0	0	49	110	15	0	3	1	1	130	3	0	0	0	0	0	0	3	74	12	3	4	2	2	0	97	279		
08:15	24	9	0	0	3	1	0	37	119	14	1	3	2	2	142	3	0	0	0	0	0	0	3	75	11	1	3	2	0	0	92	274		
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08:45	30	5	2	1	0	0	0	38	82	17	4	6	0	0	109	1	2	0	0	0	0	0	3	58	13	0	3	0	0	0	74	224		
1 Hr	114	27	6	2	4	1	0	154	414	60	6	16	5	3	505	8	2	0	0	0	0	0	10	262	44	5	10	4	3	0	328	997		
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09:15	28	6	2	0	2	0	0	38	70	15	2	4	1	2	94	1	0	0	0	0	0	0	1	41	8	2	1	0	0	0	52	185		
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09:45	26	4	3	1	0	0	0	34	73	14	3	5	1	0	96	7	0	0	0	0	0	0	7	51	9	5	4	0	0	0	69	206		
1 Hr	123	26	8	4	4	0	4	169	282	51	7	18	4	2	366	13	0	1	0	0	0	0	14	186	39	11	11	1	2	0	250	799		
3 Hrs	327	69	18	7	18	2	5	446	1053	167	17	44	18	8	1317	25	3	2	0	0	0	0	30	677	119	19	28	5	8	0	856	2649		

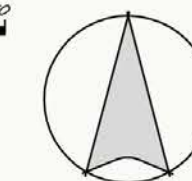
DESTINATION SUMMARY

	Destination : Arm A - Gileston Road (N)							Total	Destination : Arm B - B4265 (E)							Total	Destination : Arm C - Gileston Road (S)							Total	Destination : Arm D - B4265 (W)							Total	Dest Totals
	CAR	LGV	OGV1	OGV2	BUS	MC	PC		CAR	LGV	OGV1	OGV2	BUS	MC	PC		CAR	LGV	OGV1	OGV2	BUS	MC	PC		CAR	LGV	OGV1	OGV2	BUS	MC	PC		
15:00	38	7	2	0	0	0	1	48	95	15	1	2	1	1	115	4	1	0	0	0	0	0	5	72	10	2	3	0	0	1	88	256	
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18:15	45	1	0	0	2	0	0	48	93	6	1	1	1	0	102	3	0	0	0	0	0	0	3	60	6	0	0	2	1	1	70	223	
1/2 Hr	104	6	0	0	2	0	2	114	184	16	3	2	3	1	210	5	0	0	0	0	0	0	5	137	14	1	0	2	3	1	158	487	
3 1/2 Hrs	626	85	2	3	14	8	4	742	1340	178	18	22	17	22	1604	59	4	0	0	0	0	1	64	1098	117	14	17	12	13	6	1277	3687	
Total	953	154	20	10	32	10	9	1188	2393	345	35	66	35	30	2921	84	7	2	0	0	0	1	94	1775	236	33	45	17	21	6	2133	6336	

**acstro**

Ymgynghorwyr Priffyrdd a Thrafnidiaeth  
Highways & Transportation Consultants

# Appendix 7



THE CONTRACTOR IS TO COMPLY IN ALL RESPECTS WITH CURRENT BUILDING LEGISLATION, N.H.B.C. AND BUILDING REGULATIONS WHETHER OR NOT SPECIFICALLY STATED ON THIS DRAWING.

THIS DRAWING MUST BE READ & CHECKED AGAINST ANY STRUCTURAL, GEOTECHNICAL OR OTHER SPECIALIST DOCUMENTATION OR PLANS PROVIDED.

THIS DRAWING IS NOT INTENDED TO SHOW DETAILS OF FOUNDATIONS, GROUND CONDITIONS OR GROUND CONTAMINANTS. EACH AREA OF GROUND RELIED UPON TO SUPPORT ANY STRUCTURE DEPICTED (INCLUDING FOUNDATIONS) MUST BE INVESTIGATED BY THE CONTRACTOR. A SUITABLE METHOD OF FOUNDATION SHOULD BE PROVIDED ALLOWING FOR EXISTING GROUND CONDITIONS. ANY EARTHWORK CONSTRUCTIONS SHOWN INDICATE TYPICAL SLOPES FOR GUIDANCE ONLY AND SHOULD BE FURTHER INVESTIGATED BY A SUITABLE EXPERT.

WHERE EXISTING TREES ARE SHOWN TO BE RETAINED THEY SHOULD BE SUBJECT TO A FULL ARBORICULTURAL INSPECTION FOR SAFETY. A SUITABLE METHOD OF FOUNDATION IS TO BE PROVIDED TO ACCOMMODATE PROPOSED TREE PLANTING.

- ① Cowbridge Road
- ② Surface Water Attenuation Area
- ③ Secure Area For Access To Pump Station
- ④ Informal Public Open Space
- ⑤ LAP - 100 Sq.m
- ⑥ LEAP - 400 Sq.m
- ⑦ NEAP - 1000 Sq.m
- ⑧ Archaeological Feature - With 10m Buffer Zone
- ⑨ Footpath Link
- ⑩ Existing Residential Development
- ⑪ Existing Pump Station With Right Of Way Through Development
- ⑫ Existing Stream
- ⑬ Road Improvement Works  
- Pedestrian Crossings  
- Speed Limit Transitions Relocated  
- 2.4m x 4.3m Visibility Splays
- ⑭ Main Access  
- Roundabout Access  
- 3.5m Cycleway Link To Second Access (Matched)  
- 3.5m Gravel Path Link To West Boundary

**General Notes**

**LEGEND**

- Development Boundary
- Indicative Residential Proposed Built Form
- Dual Aspect
- Focal Building
- Vehicular Access Point
- Proposed / Diverted Public Right Of Way
- Primary Vehicular & Pedestrian Movement
- Secondary Vehicular & Pedestrian Movement
- Existing Buildings
- Flood Zone
- Existing & Proposed Hedge Buffer
- Proposed Trees
- Existing Trees To Be Retained
- Existing Trees To Be Removed
- 3.5m Foot/Cycleway Link
- 3.5m Gravel Path Link

Rev	Date	By	Comment
D	23.05.17	DA	NEAP & LAP handed. PROW route relocated. 3.5m gravel path from main entrance to West boundary
C	05.05.17	DA	Roundabout To Main Entrance
B	22.11.16	DA	Layout Replanned / NEAP relocated
A	09.11.16	DA	Access to Pump Station revised Units added adjacent to PS Modular treatment tank replaced with pump station, layout updated

RESIDENTIAL DESIGN  
PLANNING  
CIVIL ENGINEERING DESIGN

**Hammonds Yates**

HAMMONDS YATES LIMITED  
Kestrel Court : Harbour Road : Portishead : BS20 7AN  
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Client  
**Edenstone Homes**

Project Title  
**Cowbridge Road  
St Athan**

Drawing Title  
**Illustrative Masterplan**

Drawing Status

Drawn By DA	Scales 1:1000	A1	Date September 20
Job No. <b>1617</b>	Drawing No. <b>100</b>	Rev. <b>D</b>	

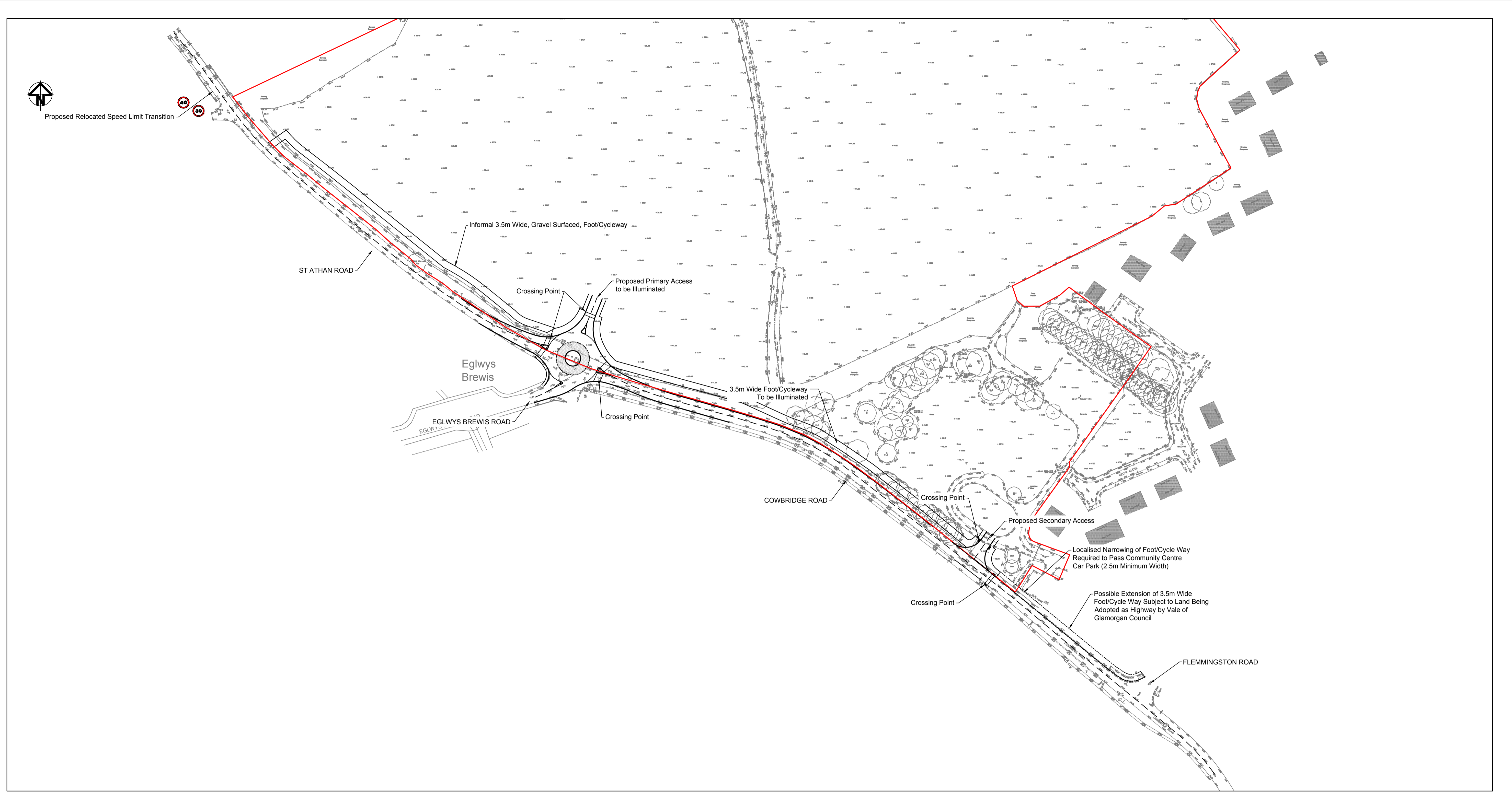
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# Appendix 8



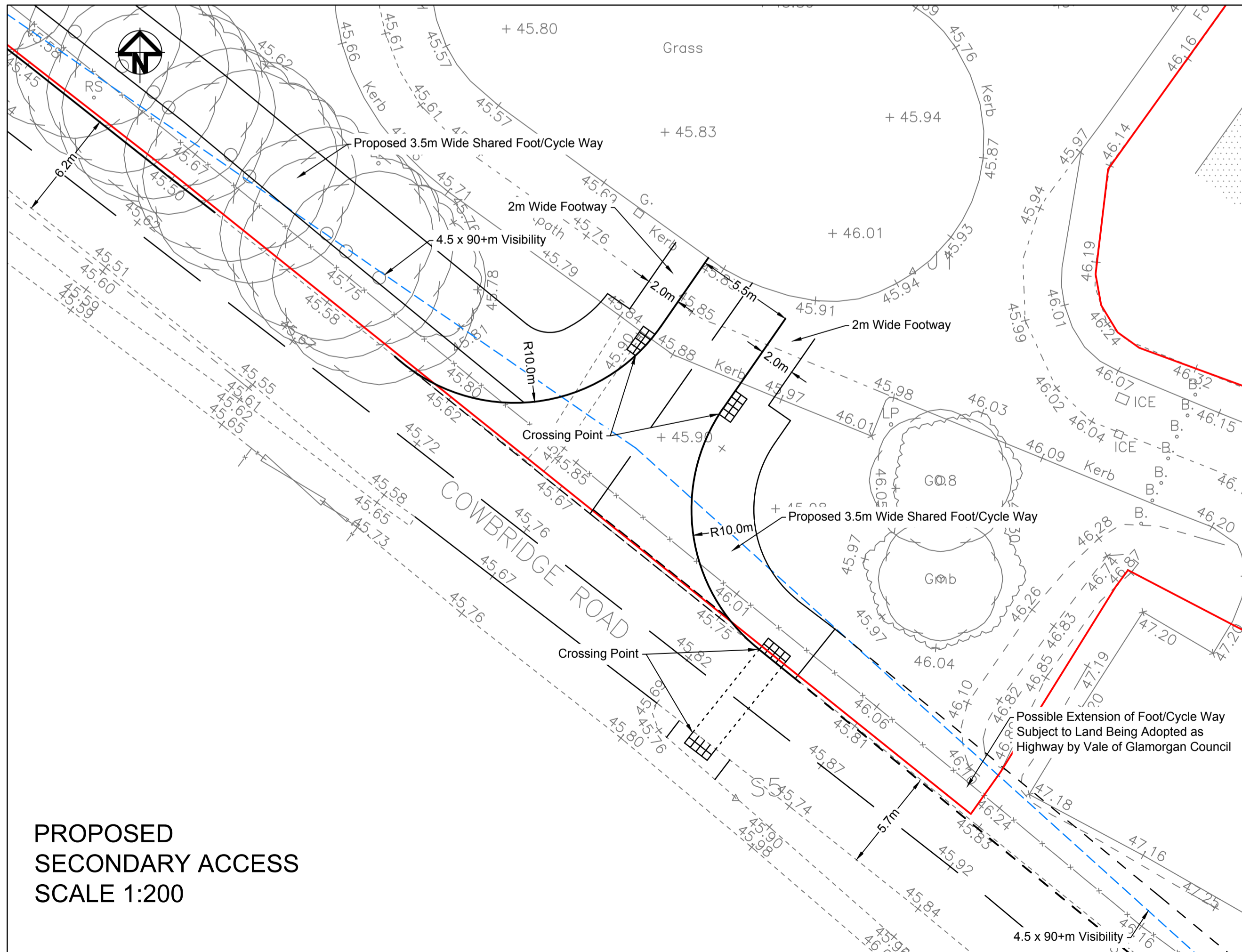
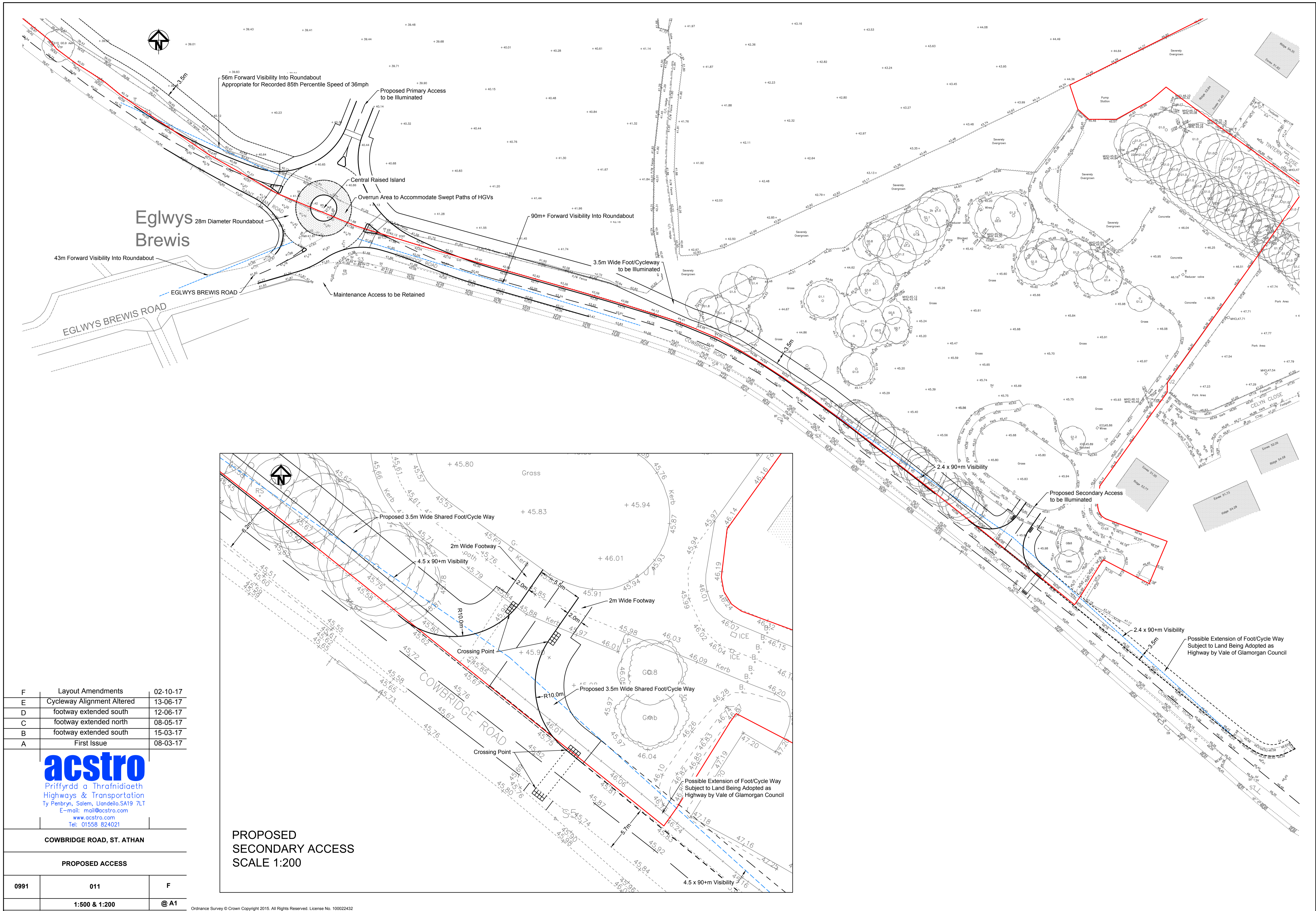
D	Layout Amendments post RSA	02-10-17
C	Cycleway Alignment	13-06-17
B	Foot/Cycleway Ext. South	12-06-17
A	First Issue	08-05-17

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 www.acstro.com  
 Tel: 01558 824021

COWBRIDGE ROAD, ST. ATHAN

**PROPOSED ACCESS & OFF-SITE HIGHWAY WORKS**

0991	0014	D
	1:1000	@ A1



**PROPOSED SECONDARY ACCESS**  
SCALE 1:200

F	Layout Amendments	02-10-17
E	Cycleway Alignment Altered	13-06-17
D	footway extended south	12-06-17
C	footway extended north	08-05-17
B	footway extended south	15-03-17
A	First Issue	08-03-17

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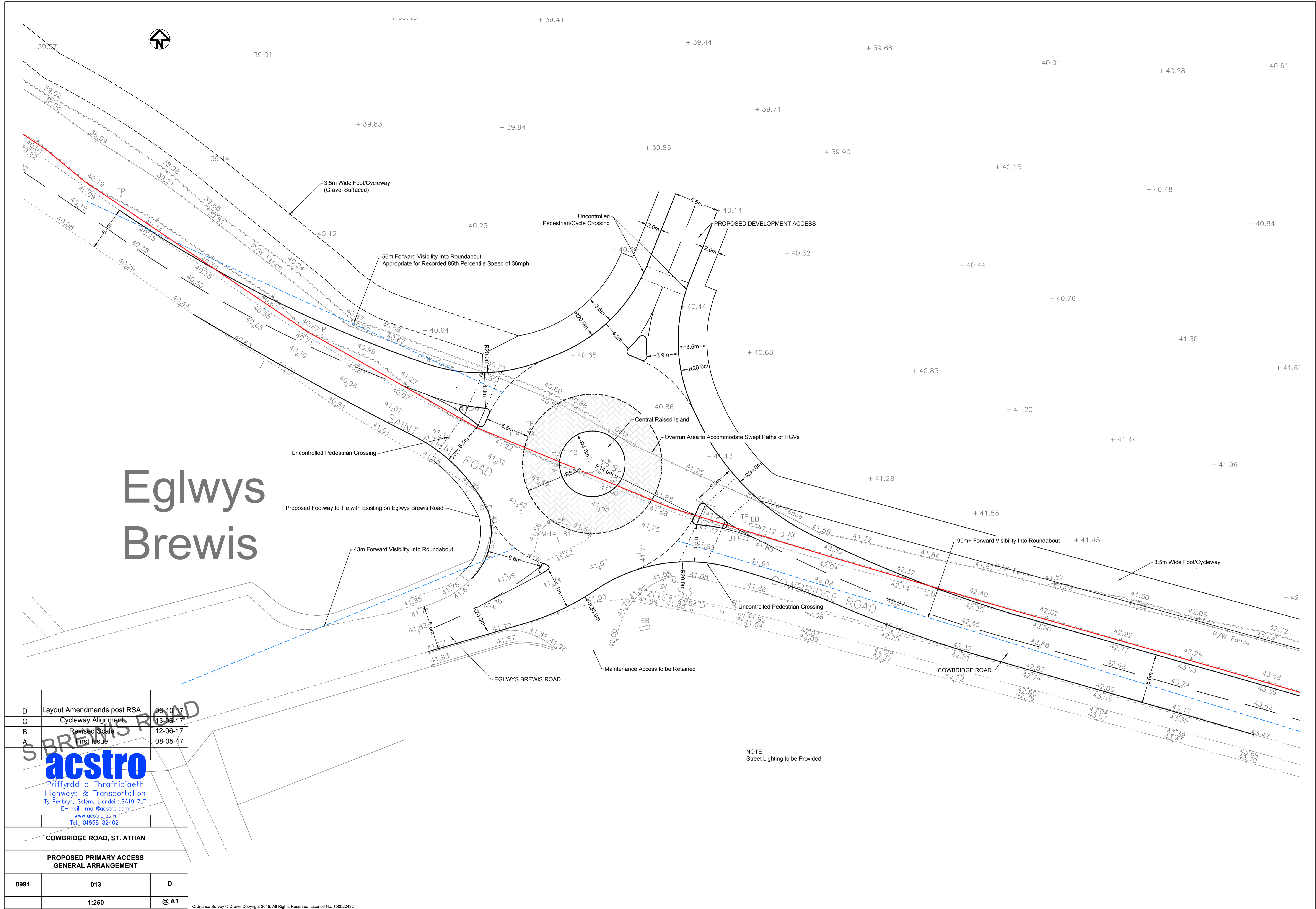
COWBRIDGE ROAD, ST. ATHAN

PROPOSED ACCESS

0991	011	F
1:500 & 1:200		@ A1



# Eglwys Brewis



D	Layout Amendmends post RSA	06-10-17
C	Cycleway Alignment	13-06-17
B	Revised Scale	12-06-17
A	First Issue	08-05-17

**acstro**

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COWBRIDGE ROAD, ST. ATHAN

PROPOSED PRIMARY ACCESS  
GENERAL ARRANGEMENT

0991	013	D
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Highways & Transportation

# Appendix 9



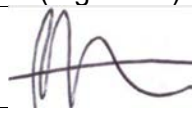
**COWBRIDGE ROAD, ST ATHAN**

**PROPOSED RESIDENTIAL DEVELOPMENT  
ACCESS ARRANGEMENTS**

**Stage 1 Road Safety Audit**

**October 2017**

**RW/DS/17/1553/RSA1**

Revision Status	Prepared by: (Name)	Checked by: (Name)	Approved by: (Signature)	Date Approved:
Original	R Westhead	D Swift		05/10/2017
Designer's Response				
Authority's Response				
Audit Response				

<b>Client:</b>	
Acstro Ltd	The Safety Forum Ltd
Ty Penbryn Salem Llandeilo SA19 7LT	PO Box 831 Godalming Surrey GU7 9HT
Date: 05/10/17	

## TABLE OF CONTENTS

1.0 INTRODUCTION.....	3
2.0 ITEMS CONSIDERED .....	5
3.0 MATTERS ARISING FROM THIS STAGE 1 AUDIT. ....	6
4.0 AUDITOR STATEMENT .....	9

**APPENDIX A**            Location Plan

**APPENDIX B**            Road Safety Audit Response

---

## 1.0 INTRODUCTION

- 1.1 This report results from a Stage 1 Road Safety Audit (RSA) carried out on proposed access arrangements for a residential development (of 253 units, as opposed to the 300 stated within the supplied transport statement) off Cowbridge Road, St Athan, in the Vale of Glamorgan in South Wales
- 1.2 The highway proposals include: the construction of a new priority controlled T-junction with Cowbridge Road; a new four arm 28m diameter roundabout at the junction of Cowbridge Road and Eglwys Bewis Road with access into the proposed development site; provision of new shared use paths / footways; and relocation of the existing speed limit terminal.
- 1.3 The site is mainly within a 30mph area, with the north-western extent of works located in an existing 40mph area. To the south of the junction of Cowbridge Road and Eglwys Bewis Road is located a military base, with some housing between Cowbridge Road and Eglwys Bewis Road, and little other existing development within the development area. There is no street lighting in the area of the proposed site on Cowbridge Road.
- 1.4 The Stage 1 RSA was carried out at the request of Acstro Ltd.
- 1.5 The Audit was carried out on 3<sup>rd</sup> October 2017 by consultants working on behalf of The Safety Forum Limited.
- 1.6 The Audit Team, which is established from The Safety Forum Ltd and independent of the project design team, has had no involvement with the project.
- 1.7 The Auditors were:
- R Westhead – Team Leader (MSoRSA, RSA Cert Comp)
- D Swift – Team Member (MSoRSA)
- 1.8 The report has been prepared in accordance with the Design Manual for Roads and Bridges (DMRB) Highways Directive (HD) 19/15.
- 1.9 The Audit consisted of a desktop study and a site visit. The site visit was carried out on 3<sup>rd</sup> October 2017, between 17:45 and 18:30 hours by all member of the Audit Team together. The weather was dry and fine and the road surface was dry. Traffic conditions were moderate

- 1.10 Issues relating to the health & safety of operatives constructing, operating or maintaining the highway are not covered by Road Safety Audit. Only issues relating to the design and construction of facilities for highway maintenance that may potentially contribute to a Road Safety Matter are considered by the Road Safety Audit process.

Road Safety Audit is not a technical check that the design conforms to Standards and/or best practice guidance. Design Organisations are responsible for ensuring that their designs have been subjected to the appropriate design reviews (including, where applicable, Non-Motorised User (NMU) assessment and review) prior to Road Safety Audit.

Road Safety Audit is not a check that the scheme has been constructed in accordance with the design.

Whilst reference is made to certain design standards, where safety may be compromised by a reduction in standard, this report is not intended to provide a design check. The Auditors have only reported on matters that might have an adverse effect on road safety in the context of the chosen design. No attempt has been made to comment on the justification of the scheme or the appropriateness of the design. Consequently, the Auditors accept no responsibility for the design or construction of the scheme.

- 1.11 The recommendations in this report are aimed at addressing the road safety problems; however there may be other alternative acceptable ways to overcome a specific problem, when other practical issues are considered. The recommendations contained herein do not absolve the Designer of his/her responsibilities.
- 1.12 The Auditors would be pleased to discuss the acceptability of alternative solutions to problems identified during the Audit, and would encourage the Designer to consult them on this matter.
- 1.13 The LHA response to the RSA should be formally recorded and reported to the Designer and the RSA Team so that a record of the Audit process is contained in the *As Built* design pack to be provided and retained by the LHA on final completion.
- 1.14 All problems identified in this Road Safety Audit Report are indicated on a location plan in Appendix A

---

## 2.0 ITEMS CONSIDERED

2.1 The Road Safety Audit was undertaken on the scheme detailed in the following documentation.

Drawing No.	Rev	Title
0991 011	E	Proposed Access
0991 013	C	Proposed Primary Access General Arrangement
0991 014	C	Proposed Access and Off-Site Highway Works
-	-	Land East of Cowbridge Road, St Athan Vale of Glamorgan. Transport Assessment

2.2 No departure from standards or other information was submitted to the Audit Team.

---

### 3.0 MATTERS ARISING FROM THIS STAGE 1 AUDIT.

#### 3.1 PROBLEM

LOCATION: Proposed roundabout.

SUMMARY: Lack of street lighting may reduce awareness of roundabout.

The proposed roundabout junction is within an existing 30mph area that is unlit by street lighting, and no new street lighting is proposed. Generally, road users would expect roundabouts of all types to be street lit, and a lack of street lighting is likely to reduce the general awareness of the proposed roundabout. This may result in road users failing to approach or use the junction safely and could result on overshoot / failure to give way conflicts.

#### RECOMMENDATION

Provide street lighting to illuminate and highlight the proposed roundabout.

#### 3.2 PROBLEM

LOCATION: Eglwys Bewis Road approach to proposed roundabout.

SUMMARY: Drivers may incorrectly interpret splitter island and presence of roundabout.

The positioning of the roundabout, and the alignment of Eglwys Bewis Road on its approach to the proposed roundabout, may make it difficult for road users to accurately perceive the junction type ahead.

The location of the splitter island on the Eglwys Bewis Road approach would be positioned to the nearside of the line of view on the carriageway approach, with the give-way line hidden from view until drivers are within approximately 15-20m. The central island, and chevron signs that would be housed on it, would be only visible from approximately 25-30m from the roundabout centre giving generally poor awareness of the roundabout.

Drivers on this approach would have a clear view through the roundabout circulatory carriageway onto the eastern arm approach. Also, the outer edge of the proposed circulatory carriageway between the Eglwys Bewis Road and Cowbridge Road southeast arm has a proposed alignment where there is minimal disruption to the sightline through the roundabout. Such drivers may therefore pass the splitter island, on the Eglwys Bewis Road approach, on the wrong side and be at risk of conflicting with opposing traffic.

The lack of proposed street lighting at this roundabout may make this risk greater in darkness.



---

## RECOMMENDATION

Ensure that the positioning of the roundabout, and its associated features (including signs, road markings, and street lighting), and the approach alignment on Eglwys Bewis Road, make it clear that there is a roundabout junction ahead and drivers must pass the splitter island to the left before giving way at the roundabout.

### 3.3 PROBLEM

LOCATION: Eastern arm of proposed roundabout.

SUMMARY: Lack of facility for cyclists to enter shared use facility.

Right turning cyclists from Eglwya Brewis Road wishing to access the shared use cycle facility are not provided with a suitable access from the circularity carriageway or Cowbridge Road. This may result in cyclists joining the shared use facility via the pedestrian crossing on Cowbridge Road in possible conflict with pedestrians.

## RECOMMENDATION

Provide a suitable facility for right turning cyclists from Eglwya Brewis Road to access the shared use facility.

### 3.4 PROBLEM

LOCATION: Commencement of shared use footways.

SUMMARY: Lack of indication that pedestrians are entering shared use footways.

No measures such as tactile paving are shown on the proposed drawings to indicate that pedestrians on existing / proposed footways are approaching proposed shared use cycle / pedestrian footways. This could result in some pedestrians being at risk of conflict with cycles due to lack of awareness.

## RECOMMENDATION

Ensure that during the detailed design stage measures such as tactile paving, road markings and signing is provided to indicate the shared use footways.

### 3.5 PROBLEM

LOCATION: Western end of shared use path.

SUMMARY: Pedestrians and cycles emerging into carriageway, possibly unexpectedly.

---

The proposed shared use gravel path that extends west from the development site roundabout re-joins the carriageway (St Athan Road) just before the bridge over a watercourse. At this point there is no footway on the northern side of the road. Pedestrians and cyclists re-joining will therefore have to continue along St Athan Road within the carriageway. They may therefore be at risk of conflict with road traffic.

#### RECOMMENDATION

Install warning signs to indicate to approaching traffic the presence of pedestrians / cyclists who are on, or entering or exiting the carriageway.

### 3.6 PROBLEM

LOCATION: Western end of shared use path.

SUMMARY: Possible ponding / risk of ice forming.

The proposed shared use path that extends west from the development site roundabout and re-joins the carriageway is indicated to be a gravel path. The Audit Team are concerned that this surface type may be easily eroded and ponding may occur at the boundary between surfaces where pedestrians and cyclists will be moving through. Any such ponding could result in ice forming in freezing conditions. This could result in a slip or skid hazard and be of particular concern for cyclists or pedestrians slowing before entering the carriageway.

#### RECOMMENDATION

Ensure that the surfacing and construction of path and its boundary with the carriageway facilitates the removal of water, and remains in effective conditions.

---

## 4.0 AUDITOR STATEMENT

4.1 We certify that this audit has been carried out in accordance with HD 19/15.

### AUDIT TEAM LEADER

R Westhead  
The Safety Forum Ltd  
PO Box 831  
Godalming  
Surrey  
GU7 9HT

Signed: 

Date: 05 October 2017

### AUDIT TEAM MEMBER

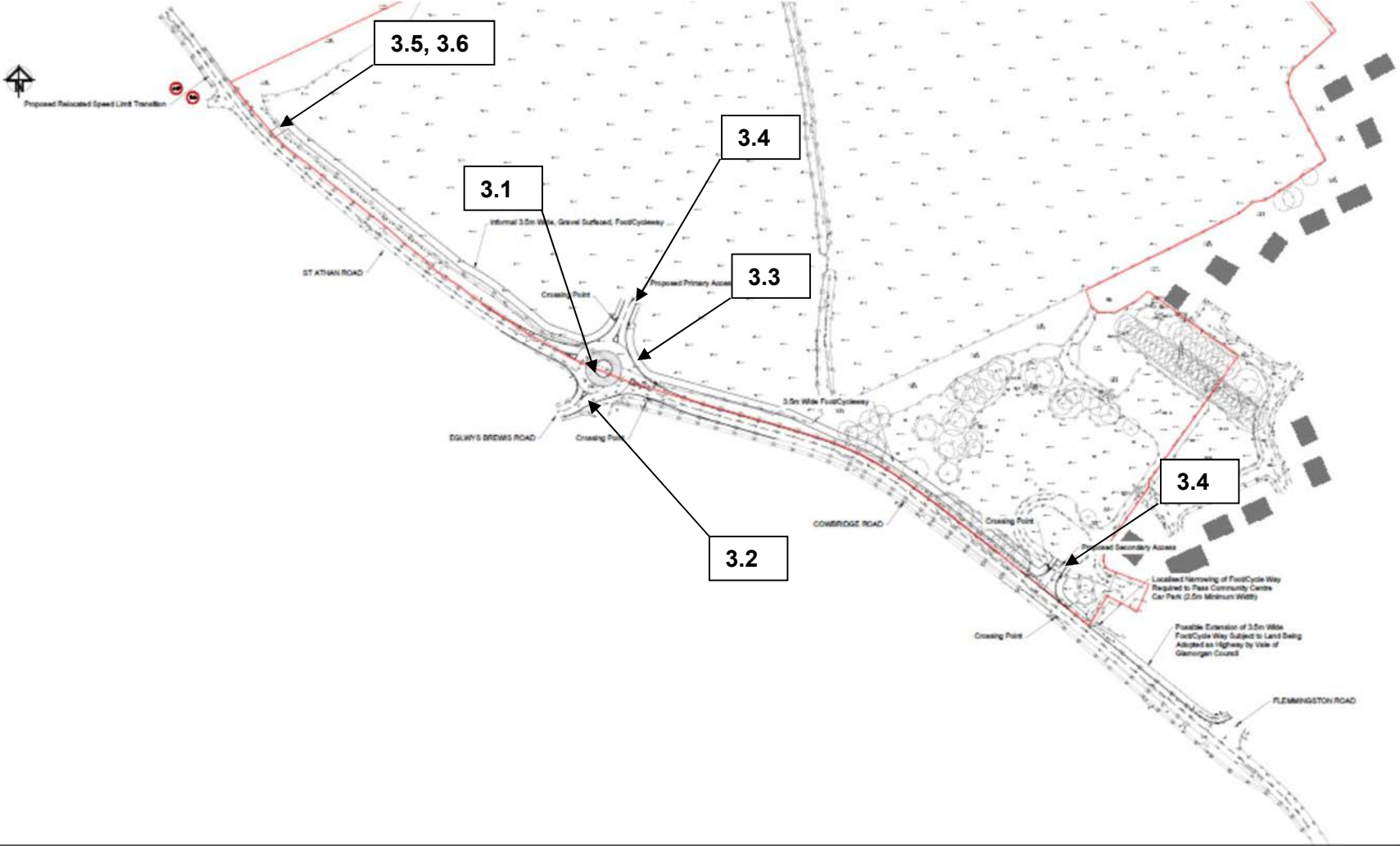
D Swift

Signed: 

Date: 05 October 2017



# APPENDIX A: LOCATION PLAN



## APPENDIX B: Road Safety Audit Response

Auditors: R Westhead (Team Leader) and D Swift (Team Member).

Date Response Completed:

Scheme: Cowbridge Road, St Athan. Proposed Access Arrangements.

This response is to a Stage 1 Road Safety Audit to the design standard detailed within HD19/15 of Volume 5, Section 2, Part 2, of the Design Manual for Roads and Bridges, as detailed by the Highways Agency.

<b>Problem no. in safety audit report</b>	<b>Problem accepted (yes/no)</b>	<b>Recommended measure accepted (yes/no)</b>	<b>Alternative measure (detail description)</b>
3.1	Yes	Yes	Street lighting to be provided.
3.2	Yes	Yes	Approach to roundabout has been adjusted to provide improved forward visibility. 43m SSD is available to give-way line as is required in 30mph areas. Street lighting to be provided.
3.3	Yes	Yes	Foot/Cycleway detail adjacent to roundabout and its eastern arm has been adjusted to allow cyclists from Eglwys Brewis Road to enter cycle path.
3.4	Yes	Yes	To be addressed at detailed design stage
3.5	Yes	Yes	To be addressed at detailed design stage
3.6	Yes	Yes	To be addressed at detailed design stage

**Principal Engineer's / Audit Project Sponsor's Statement:**

Road Safety Audit for Cowbridge Road, St Athan. Proposed Access Arrangements.

I certify that I have considered the items raised in the Stage 1 Road Safety Audit Report and I am content to accept all of its recommendations except for the ones listed above. I have stated my reasons for not accepting them and I seek the Chief Engineer's endorsement of my proposals.



..... Date 06/10/2017

Principal Engineer

**Chief Engineer's / Director's Decision:**

I accept these proposals by the Principal Engineer.



..... Date 06/10/2017

Chief Engineer



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# Appendix 10

Calculation Reference: AUDIT-648801-160929-0955

## TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL  
 Category : A - HOUSES PRIVATELY OWNED  
 VEHICLES

Selected regions and areas:

02	SOUTH EAST	
	EX ESSEX	1 days
	WS WEST SUSSEX	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE	
	NE NORTH EAST LINCOLNSHIRE	1 days
08	NORTH WEST	
	CH CHESHIRE	1 days
11	SCOTLAND	
	FA FALKIRK	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

## Filtering Stage 2 selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Number of dwellings  
 Actual Range: 151 to 432 (units: )  
 Range Selected by User: 150 to 450 (units: )

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/08 to 11/12/14

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Monday	1 days
Tuesday	2 days
Wednesday	1 days
Thursday	1 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	5 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaken using machines.

Selected Locations:

Suburban Area (PPS6 Out of Centre)	1
Edge of Town	4

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Residential Zone	4
No Sub Category	1

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Filtering Stage 3 selection:

Use Class:

C3	5 days
----	--------

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Population within 1 mile:

5,001 to 10,000	1 days
10,001 to 15,000	2 days
15,001 to 20,000	1 days
20,001 to 25,000	1 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

50,001 to 75,000	1 days
75,001 to 100,000	1 days
100,001 to 125,000	2 days
125,001 to 250,000	1 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0	3 days
1.1 to 1.5	2 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

Yes	1 days
No	4 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

LIST OF SITES relevant to selection parameters

1	CH-03-A-02 SYDNEY ROAD	HOUSES/FLATS		CESHIRE
	CREWE			
	Edge of Town			
	Residential Zone			
	Total Number of dwellings:		174	
	Survey date: TUESDAY		14/10/08	Survey Type: MANUAL
2	EX-03-A-01 MILTON ROAD	SEMI -DET.		ESSEX
	CORRINGHAM			
	STANFORD-LE-HOPE			
	Edge of Town			
	Residential Zone			
	Total Number of dwellings:		237	
	Survey date: TUESDAY		13/05/08	Survey Type: MANUAL
3	FA-03-A-02 ROSEBANK AVENUE & SPRINGFIELD DRIVE	MIXED HOUSES		FALKIRK
	FALKIRK			
	Suburban Area (PPS6 Out of Centre)			
	Residential Zone			
	Total Number of dwellings:		161	
	Survey date: WEDNESDAY		29/05/13	Survey Type: MANUAL
4	NE-03-A-02 HANOVER WALK	SEMI DETACHED & DETACHED		NORTH EAST LINCOLNSHIRE
	SCUNTHORPE			
	Edge of Town			
	No Sub Category			
	Total Number of dwellings:		432	
	Survey date: MONDAY		12/05/14	Survey Type: MANUAL
5	WS-03-A-04 HILLS FARM LANE	MIXED HOUSES		WEST SUSSEX
	BROADBRIDGE HEATH			
	HORSHAM			
	Edge of Town			
	Residential Zone			
	Total Number of dwellings:		151	
	Survey date: THURSDAY		11/12/14	Survey Type: MANUAL

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED  
VEHICLES

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	5	231	0.064	5	231	0.256	5	231	0.320
08:00 - 09:00	5	231	0.104	5	231	0.371	5	231	0.475
09:00 - 10:00	5	231	0.121	5	231	0.144	5	231	0.265
10:00 - 11:00	5	231	0.121	5	231	0.160	5	231	0.281
11:00 - 12:00	5	231	0.116	5	231	0.126	5	231	0.242
12:00 - 13:00	5	231	0.171	5	231	0.145	5	231	0.316
13:00 - 14:00	5	231	0.152	5	231	0.153	5	231	0.305
14:00 - 15:00	5	231	0.170	5	231	0.194	5	231	0.364
15:00 - 16:00	5	231	0.306	5	231	0.213	5	231	0.519
16:00 - 17:00	5	231	0.306	5	231	0.188	5	231	0.494
17:00 - 18:00	5	231	0.312	5	231	0.199	5	231	0.511
18:00 - 19:00	5	231	0.254	5	231	0.185	5	231	0.439
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
<b>Total Rates:</b>			<b>2.197</b>			<b>2.334</b>			<b>4.531</b>

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is:  $COUNT/TRP*FACT$ . Trip rates are then rounded to 3 decimal places.

#### Parameter summary

Trip rate parameter range selected: 151 - 432 (units: )  
 Survey date date range: 01/01/08 - 11/12/14  
 Number of weekdays (Monday-Friday): 5  
 Number of Saturdays: 0  
 Number of Sundays: 0  
 Surveys automatically removed from selection: 0  
 Surveys manually removed from selection: 0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are shown. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

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# Appendix 11

# ARCADY 7

Version: 7.0.0.99 [10 July 2009]  
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File: Z:\OneDrive - Acstro Limited\Shared with Everyone\ACSTRO Jobs\0991 Cowbridge Rd St Athan\ARCADY\site access.arc7  
Report generation date: 10/6/2017 9:38:03 AM

## Summary of roundabout performance

	AM				PM			
	Queue (Veh)	Delay (min)	RFC	LOS	Queue (Veh)	Delay (min)	RFC	LOS
<b>Proposed Roundabout - Design 2027</b>								
Site Access	0.11	0.07	0.10	A	0.06	0.07	0.06	A
Cowbridge Road	0.45	0.08	0.31	A	0.30	0.07	0.23	A
Eglwys Brewis Road	0.25	0.09	0.20	A	0.20	0.09	0.17	A
St Athan Road	0.13	0.06	0.12	A	0.22	0.07	0.18	A

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle.

Design 2027 - AM runs from 07:45:00 to 09:15:00  
Design 2027 - PM runs from 16:45:00 to 18:15:00

## File summary

### File Description

Title	Proposed Access
Date	6/8/2017
Status	(new file)
Enumerator	ALUNREES41AFAdministrator
Results Upto Date	False

## Analysis Options

RFC Threshold	Vehicle Length (m)	Do Queue Variations
0.85	5.75	

## Sorting and Display

Show Arm Names	Arm Grouping	Sorting Direction	Sorting Type	Data Matrix Style	Time Style
Yes	Order	Ascending	Numerical	By Destination	Absolute Time

## Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	Veh	Veh	perHour	min	-Min	perMin

# A1 - Proposed Roundabout - D1 - Design 2027, AM

## Data Errors and Warnings

No errors or warnings

## Analysis Set Details

Name	Description	Include In	Use Specific	Demand	Locked	Network Flow	Network Capacity	Reason For
------	-------------	------------	--------------	--------	--------	--------------	------------------	------------

	Report	Demand Set	Set	Scaling Factor (%)	Scaling Factor (%)	Scaling Factors
Proposed Roundabout	Yes		(D1)	100.000	100.000	

## Demand Set Details

Name	Scenario Name	Time Period Name	Description	Locked	Run Automatically	Use Relationship	Relationship	Start Time (HH:mm)	Finish Time (HH:mm)	Time Period Length (min)	Time Segment Length (min)	Traffic Profile Type
Design 2027, AM	Design 2027	AM			Yes			07:45	09:15	90	15	ONE HOUR

# Roundabout Network

## Roundabout Type(s)

ID	Name	Arm Order	Roundabout Type	Grade Separated	Large Roundabout	Do Geometric Delay
1	(untitled)	1,2,3,4	Standard			

## Roundabout Network Options

Driving Side	Lighting	Road Surface	In London
Left	Normal/unknown	((Mini-roundabouts only))	

# Arms

## Arms

ID	Name	Description
1	Site Access	
2	Cowbridge Road	
3	Eglwys Brewis Road	
4	St Athan Road	

## Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)	Assume Flat Start Profile	Initial Queue (PCU)
Site Access	0.00	99999.00		0.00
Cowbridge Road	0.00	99999.00		0.00
Eglwys Brewis Road	0.00	99999.00		0.00
St Athan Road	0.00	99999.00		0.00

## Standard Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
Site Access	2.75	3.97	5.00	20.00	28.00	30.00	
Cowbridge Road	3.00	4.50	5.00	20.00	28.00	30.00	
Eglwys Brewis Road	2.80	3.40	3.00	8.00	28.00	35.00	
St Athan Road	3.13	4.60	5.00	20.00	28.00	25.00	

## Pedestrian Crossings

Arm	Crossing Type
Site Access	None
Cowbridge Road	None
Eglwys Brewis Road	None
St Athan Road	None

## Arm Slope/ Intercept and Capacity



## Slope and Intercept used in model

Arm	Enter Directly	Slope	Intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
Site Access		((calculated))	((calculated))	0.524	1040.831
Cowbridge Road		((calculated))	((calculated))	0.545	1140.888
Eglwys Brewis Road		((calculated))	((calculated))	0.462	872.249
St Athan Road		((calculated))	((calculated))	0.562	1198.325

*The slope and intercept shown above include any corrections and adjustments.*

# Traffic Flows

## Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		Yes	Yes	HV Percentages	2.00				Yes	Yes

# Entry Flows

## General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)	PHF
Site Access	ONE HOUR	Yes	84.00	100.000	N/A
Cowbridge Road	ONE HOUR	Yes	314.00	100.000	N/A
Eglwys Brewis Road	ONE HOUR	Yes	142.00	100.000	N/A
St Athan Road	ONE HOUR	Yes	119.00	100.000	N/A

# Direct/Resultant Flows

## Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (Veh/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (Veh/hr)	Direct Demand Pedestrian Flow (Ped/hr)
7:45 AM-8:00 AM	Site Access	63.24	63.24	N/A	N/A
7:45 AM-8:00 AM	Cowbridge Road	236.40	236.40	N/A	N/A
7:45 AM-8:00 AM	Eglwys Brewis Road	106.91	106.91	N/A	N/A
7:45 AM-8:00 AM	St Athan Road	89.59	89.59	N/A	N/A
8:00 AM-8:15 AM	Site Access	75.51	75.51	N/A	N/A
8:00 AM-8:15 AM	Cowbridge Road	282.28	282.28	N/A	N/A
8:00 AM-8:15 AM	Eglwys Brewis Road	127.66	127.66	N/A	N/A
8:00 AM-8:15 AM	St Athan Road	106.98	106.98	N/A	N/A
8:15 AM-8:30 AM	Site Access	92.49	92.49	N/A	N/A
8:15 AM-8:30 AM	Cowbridge Road	345.72	345.72	N/A	N/A
8:15 AM-8:30 AM	Eglwys Brewis Road	156.34	156.34	N/A	N/A
8:15 AM-8:30 AM	St Athan Road	131.02	131.02	N/A	N/A
8:30 AM-8:45 AM	Site Access	92.49	92.49	N/A	N/A

8:30 AM-8:45 AM	Cowbridge Road	345.72	345.72	N/A	N/A
8:30 AM-8:45 AM	Eglwys Brewis Road	156.34	156.34	N/A	N/A
8:30 AM-8:45 AM	St Athan Road	131.02	131.02	N/A	N/A
8:45 AM-9:00 AM	Site Access	75.51	75.51	N/A	N/A
8:45 AM-9:00 AM	Cowbridge Road	282.28	282.28	N/A	N/A
8:45 AM-9:00 AM	Eglwys Brewis Road	127.66	127.66	N/A	N/A
8:45 AM-9:00 AM	St Athan Road	106.98	106.98	N/A	N/A
9:00 AM-9:15 AM	Site Access	63.24	63.24	N/A	N/A
9:00 AM-9:15 AM	Cowbridge Road	236.40	236.40	N/A	N/A
9:00 AM-9:15 AM	Eglwys Brewis Road	106.91	106.91	N/A	N/A
9:00 AM-9:15 AM	St Athan Road	89.59	89.59	N/A	N/A

## Turning Proportions

### Turning Counts or Proportions (Veh/hr) - Roundabout 1 (for whole period)

		To			
		1	2	3	4
From	1	0.00	51.00	8.00	25.00
	2	14.00	0.00	181.00	119.00
	3	2.00	109.00	0.00	31.00
	4	7.00	89.00	23.00	0.00

### Turning Proportions (Veh) - Roundabout 1 (for whole period)

		To			
		1	2	3	4
From	1	0.00	0.61	0.10	0.30
	2	0.04	0.00	0.58	0.38
	3	0.01	0.77	0.00	0.22
	4	0.06	0.75	0.19	0.00

## Vehicle Mix

### Average PCU Per Vehicle - Roundabout 1 (for whole period)

		To			
		1	2	3	4
From	1	1.00	1.00	1.00	1.00
	2	1.00	1.00	1.00	1.00
	3	1.00	1.00	1.00	1.00
	4	1.00	1.00	1.00	1.00

### Heavy Vehicle Percentages - Roundabout 1 (for whole period)

		To			
		1	2	3	4
From	1	0.00	0.00	0.00	0.00
	2	0.00	0.00	0.00	0.00
	3	0.00	0.00	0.00	0.00
	4	0.00	0.00	0.00	0.00

# Results

## Results Summary

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Total Demand (Veh/hr)	Total Arrivals (Veh)	Total Queueing Delay (Veh-min)	Average Queueing Delay (min)	Rate Of Queueing Delay (Veh-min/min)	Inclusive Queueing Total Delay (Veh-min)	Inclusive Queueing Average Delay (min)	Slope	Intercept (PCU/hr)
Site Access	0.10	0.07	0.11	A	77.08	115.62	8.10	0.07	0.09	8.10	0.07	0.524	1040.831
Cowbridge Road	0.31	0.08	0.45	A	288.13	432.20	31.62	0.07	0.35	31.62	0.07	0.545	1140.888
Eglwys Brewis Road	0.20	0.09	0.25	A	130.30	195.45	17.40	0.09	0.19	17.40	0.09	0.462	872.249
St Athan Road	0.12	0.06	0.13	A	109.20	163.79	9.59	0.06	0.11	9.59	0.06	0.562	1198.325

## Overview: Standard Roundabout Geometry

### Standard Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only	Final Slope	Final Intercept (PCU/hr)
Site Access	2.75	3.97	5.00	20.00	28.00	30.00		0.524	1040.831
Cowbridge Road	3.00	4.50	5.00	20.00	28.00	30.00		0.545	1140.888
Eglwys Brewis Road	2.80	3.40	3.00	8.00	28.00	35.00		0.462	872.249
St Athan Road	3.13	4.60	5.00	20.00	28.00	25.00		0.562	1198.325

## Overview: Time Segment Results

### Time Segment Results

Time Segment	Arm	Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Pedestrian Demand (Ped/hr)	Start Queue (Veh)	End Queue (Veh)	Queueing Total Delay (Veh-min)	Geometric Total Delay (Veh-min)	Average Delay Per Arriving Vehicle (min)
7:45 AM-8:00 AM	Site Access	63.24	953.98	0.066	0.00	0.00	0.07	1.04	(0.00)	0.067
7:45 AM-8:00 AM	Cowbridge Road	236.40	1118.01	0.211	0.00	0.00	0.27	3.91	(0.00)	0.068
7:45 AM-8:00 AM	Eglwys Brewis Road	106.91	817.58	0.131	0.00	0.00	0.15	2.18	(0.00)	0.084
7:45 AM-8:00 AM	St Athan Road	89.59	1145.71	0.078	0.00	0.00	0.08	1.24	(0.00)	0.057
8:00 AM-8:15 AM	Site Access	75.51	936.73	0.081	0.00	0.07	0.09	1.29	(0.00)	0.070
8:00 AM-8:15 AM	Cowbridge Road	282.28	1113.47	0.254	0.00	0.27	0.34	4.98	(0.00)	0.072
8:00 AM-8:15 AM	Eglwys Brewis Road	127.66	806.74	0.158	0.00	0.15	0.19	2.75	(0.00)	0.088
8:00 AM-8:15 AM	St Athan Road	106.98	1135.22	0.094	0.00	0.08	0.10	1.54	(0.00)	0.058
8:15 AM-8:30 AM	Site Access	92.49	913.36	0.101	0.00	0.09	0.11	1.66	(0.00)	0.073
8:15 AM-8:30 AM	Cowbridge Road	345.72	1107.32	0.312	0.00	0.34	0.45	6.63	(0.00)	0.079
8:15 AM-8:30 AM	Eglwys Brewis Road	156.34	792.04	0.197	0.00	0.19	0.24	3.59	(0.00)	0.094
8:15 AM-8:30 AM	St Athan Road	131.02	1121.06	0.117	0.00	0.10	0.13	1.95	(0.00)	0.061
8:30 AM-8:45 AM	Site Access	92.49	913.22	0.101	0.00	0.11	0.11	1.68	(0.00)	0.073
8:30 AM-8:45 AM	Cowbridge Road	345.72	1107.29	0.312	0.00	0.45	0.45	6.77	(0.00)	0.079
8:30 AM-8:45 AM	Eglwys Brewis Road	156.34	791.94	0.197	0.00	0.24	0.25	3.67	(0.00)	0.094

8:30 AM-8:45 AM	St Athan Road	131.02	1120.95	0.117	0.00	0.13	0.13	1.98	(0.00)	0.061
8:45 AM-9:00 AM	Site Access	75.51	936.49	0.081	0.00	0.11	0.09	1.34	(0.00)	0.070
8:45 AM-9:00 AM	Cowbridge Road	282.28	1113.42	0.254	0.00	0.45	0.34	5.22	(0.00)	0.072
8:45 AM-9:00 AM	Eglwys Brewis Road	127.66	806.57	0.158	0.00	0.25	0.19	2.90	(0.00)	0.088
8:45 AM-9:00 AM	St Athan Road	106.98	1135.04	0.094	0.00	0.13	0.10	1.59	(0.00)	0.058
9:00 AM-9:15 AM	Site Access	63.24	953.47	0.066	0.00	0.09	0.07	1.09	(0.00)	0.067
9:00 AM-9:15 AM	Cowbridge Road	236.40	1117.89	0.211	0.00	0.34	0.27	4.11	(0.00)	0.068
9:00 AM-9:15 AM	Eglwys Brewis Road	106.91	817.27	0.131	0.00	0.19	0.15	2.31	(0.00)	0.084
9:00 AM-9:15 AM	St Athan Road	89.59	1145.34	0.078	0.00	0.10	0.09	1.29	(0.00)	0.057

# A1 - Proposed Roundabout - D2 - Design 2027, PM

## Data Errors and Warnings

No errors or warnings

## Analysis Set Details

Name	Description	Include In Report	Use Specific Demand Set	Demand Set	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
Proposed Roundabout		Yes		(D1)		100.000	100.000	

## Demand Set Details

Name	Scenario Name	Time Period Name	Description	Locked	Run Automatically	Use Relationship	Relationship	Start Time (HH:mm)	Finish Time (HH:mm)	Time Period Length (min)	Time Segment Length (min)	Traffic Profile Type
Design 2027, PM	Design 2027	PM			Yes			16:45	18:15	90	15	ONE HOUR

# Roundabout Network

## Roundabout Type(s)

ID	Name	Arm Order	Roundabout Type	Grade Separated	Large Roundabout	Do Geometric Delay
1	(untitled)	1,2,3,4	Standard			

## Roundabout Network Options

Driving Side	Lighting	Road Surface	In London
Left	Normal/unknown	((Mini-roundabouts only))	

# Arms

## Arms

ID	Name	Description
1	Site Access	

- 2 Cowbridge Road
- 3 Eglwys Brewis Road
- 4 St Athan Road

## Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)	Assume Flat Start Profile	Initial Queue (PCU)
Site Access	0.00	99999.00		0.00
Cowbridge Road	0.00	99999.00		0.00
Eglwys Brewis Road	0.00	99999.00		0.00
St Athan Road	0.00	99999.00		0.00

## Standard Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
Site Access	2.75	3.97	5.00	20.00	28.00	30.00	
Cowbridge Road	3.00	4.50	5.00	20.00	28.00	30.00	
Eglwys Brewis Road	2.80	3.40	3.00	8.00	28.00	35.00	
St Athan Road	3.13	4.60	5.00	20.00	28.00	25.00	

## Pedestrian Crossings

Arm	Crossing Type
Site Access	None
Cowbridge Road	None
Eglwys Brewis Road	None
St Athan Road	None

## Arm Slope/ Intercept and Capacity

### Slope and Intercept used in model

Arm	Enter Directly	Slope	Intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
Site Access		((calculated))	((calculated))	0.524	1040.831
Cowbridge Road		((calculated))	((calculated))	0.545	1140.888
Eglwys Brewis Road		((calculated))	((calculated))	0.462	872.249
St Athan Road		((calculated))	((calculated))	0.562	1198.325

*The slope and intercept shown above include any corrections and adjustments.*

## Traffic Flows

### Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		Yes	Yes	HV Percentages	2.00				Yes	Yes

## Entry Flows

### General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)	PHF
Site Access	ONE HOUR	Yes	46.00	100.000	N/A
Cowbridge Road	ONE HOUR	Yes	236.00	100.000	N/A
Eglwys Brewis Road	ONE HOUR	Yes	124.00	100.000	N/A
St Athan Road	ONE HOUR	Yes	180.00	100.000	N/A

# Direct/Resultant Flows

## Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (Veh/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (Veh/hr)	Direct Demand Pedestrian Flow (Ped/hr)
4:45 PM-5:00 PM	Site Access	34.63	34.63	N/A	N/A
4:45 PM-5:00 PM	Cowbridge Road	177.67	177.67	N/A	N/A
4:45 PM-5:00 PM	Eglwys Brewis Road	93.35	93.35	N/A	N/A
4:45 PM-5:00 PM	St Athan Road	135.51	135.51	N/A	N/A
5:00 PM-5:15 PM	Site Access	41.35	41.35	N/A	N/A
5:00 PM-5:15 PM	Cowbridge Road	212.16	212.16	N/A	N/A
5:00 PM-5:15 PM	Eglwys Brewis Road	111.47	111.47	N/A	N/A
5:00 PM-5:15 PM	St Athan Road	161.82	161.82	N/A	N/A
5:15 PM-5:30 PM	Site Access	50.65	50.65	N/A	N/A
5:15 PM-5:30 PM	Cowbridge Road	259.84	259.84	N/A	N/A
5:15 PM-5:30 PM	Eglwys Brewis Road	136.53	136.53	N/A	N/A
5:15 PM-5:30 PM	St Athan Road	198.18	198.18	N/A	N/A
5:30 PM-5:45 PM	Site Access	50.65	50.65	N/A	N/A
5:30 PM-5:45 PM	Cowbridge Road	259.84	259.84	N/A	N/A
5:30 PM-5:45 PM	Eglwys Brewis Road	136.53	136.53	N/A	N/A
5:30 PM-5:45 PM	St Athan Road	198.18	198.18	N/A	N/A
5:45 PM-6:00 PM	Site Access	41.35	41.35	N/A	N/A
5:45 PM-6:00 PM	Cowbridge Road	212.16	212.16	N/A	N/A
5:45 PM-6:00 PM	Eglwys Brewis Road	111.47	111.47	N/A	N/A
5:45 PM-6:00 PM	St Athan Road	161.82	161.82	N/A	N/A
6:00 PM-6:15 PM	Site Access	34.63	34.63	N/A	N/A
6:00 PM-6:15 PM	Cowbridge Road	177.67	177.67	N/A	N/A
6:00 PM-6:15 PM	Eglwys Brewis Road	93.35	93.35	N/A	N/A
6:00 PM-6:15 PM	St Athan Road	135.51	135.51	N/A	N/A

## Turning Proportions

### Turning Counts or Proportions (Veh/hr) - Roundabout 1 (for whole period)

		To			
		1	2	3	4
From	1	0.00	27.00	5.00	14.00
	2	43.00	0.00	110.00	83.00
	3	7.00	107.00	0.00	10.00
	4	21.00	126.00	33.00	0.00

### Turning Proportions (Veh) - Roundabout 1 (for whole period)

		To			
		1	2	3	4
From	1	0.00	0.59	0.11	0.30
	2	0.18	0.00	0.47	0.35
	3	0.06	0.86	0.00	0.08
	4	0.12	0.70	0.18	0.00

## Vehicle Mix

### Average PCU Per Vehicle - Roundabout 1 (for whole period)

		To			
		1	2	3	4
From	1	1.00	1.00	1.00	1.00
	2	1.00	1.00	1.00	1.00
	3	1.00	1.00	1.00	1.00
	4	1.00	1.00	1.00	1.00

### Heavy Vehicle Percentages - Roundabout 1 (for whole period)

		To			
		1	2	3	4
From	1	0.00	0.00	0.00	0.00
	2	0.00	0.00	0.00	0.00
	3	0.00	0.00	0.00	0.00
	4	0.00	0.00	0.00	0.00

## Results

### Results Summary

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Total Demand (Veh/hr)	Total Arrivals (Veh)	Total Queueing Delay (Veh-min)	Average Queueing Delay (min)	Rate Of Queueing Delay (Veh-min/min)	Inclusive Queueing Total Delay (Veh-min)	Inclusive Queueing Average Delay (min)	Slope	Intercept (PCU/hr)
Site Access	0.06	0.07	0.06	A	42.21	63.32	4.36	0.07	0.05	4.36	0.07	0.524	1040.831
Cowbridge Road	0.23	0.07	0.30	A	216.56	324.84	21.74	0.07	0.24	21.75	0.07	0.545	1140.888
Eglwys Brewis Road	0.17	0.09	0.20	A	113.78	170.68	14.65	0.09	0.16	14.65	0.09	0.462	872.249
St Athan Road	0.18	0.07	0.22	A	165.17	247.76	15.65	0.06	0.17	15.65	0.06	0.562	1198.325

## Overview: Standard Roundabout Geometry

### Standard Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only	Final Slope	Final Intercept (PCU/hr)
Site Access	2.75	3.97	5.00	20.00	28.00	30.00		0.524	1040.831
Cowbridge Road	3.00	4.50	5.00	20.00	28.00	30.00		0.545	1140.888
Eglwys Brewis Road	2.80	3.40	3.00	8.00	28.00	35.00		0.462	872.249
St Athan Road	3.13	4.60	5.00	20.00	28.00	25.00		0.562	1198.325

## Overview: Time Segment Results

## Time Segment Results


Time Segment	Arm	Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Pedestrian Demand (Ped/hr)	Start Queue (Veh)	End Queue (Veh)	Queueing Total Delay (Veh-min)	Geometric Total Delay (Veh-min)	Average Delay Per Arriving Vehicle (min)
4:45 PM-5:00 PM	Site Access	34.63	936.28	0.037	0.00	0.00	0.04	0.56	(0.00)	0.067
4:45 PM-5:00 PM	Cowbridge Road	177.67	1119.64	0.159	0.00	0.00	0.19	2.75	(0.00)	0.064
4:45 PM-5:00 PM	Eglwys Brewis Road	93.35	823.80	0.113	0.00	0.00	0.13	1.86	(0.00)	0.082
4:45 PM-5:00 PM	St Athan Road	135.51	1132.21	0.120	0.00	0.00	0.14	1.99	(0.00)	0.060
5:00 PM-5:15 PM	Site Access	41.35	915.53	0.045	0.00	0.04	0.05	0.70	(0.00)	0.069
5:00 PM-5:15 PM	Cowbridge Road	212.16	1115.43	0.190	0.00	0.19	0.23	3.45	(0.00)	0.066
5:00 PM-5:15 PM	Eglwys Brewis Road	111.47	814.19	0.137	0.00	0.13	0.16	2.33	(0.00)	0.085
5:00 PM-5:15 PM	St Athan Road	161.82	1119.06	0.145	0.00	0.14	0.17	2.49	(0.00)	0.063
5:15 PM-5:30 PM	Site Access	50.65	887.41	0.057	0.00	0.05	0.06	0.89	(0.00)	0.072
5:15 PM-5:30 PM	Cowbridge Road	259.84	1109.72	0.234	0.00	0.23	0.30	4.48	(0.00)	0.071
5:15 PM-5:30 PM	Eglwys Brewis Road	136.53	801.16	0.170	0.00	0.16	0.20	3.00	(0.00)	0.090
5:15 PM-5:30 PM	St Athan Road	198.18	1101.27	0.180	0.00	0.17	0.22	3.22	(0.00)	0.066
5:30 PM-5:45 PM	Site Access	50.65	887.23	0.057	0.00	0.06	0.06	0.90	(0.00)	0.072
5:30 PM-5:45 PM	Cowbridge Road	259.84	1109.69	0.234	0.00	0.30	0.30	4.57	(0.00)	0.071
5:30 PM-5:45 PM	Eglwys Brewis Road	136.53	801.09	0.170	0.00	0.20	0.20	3.07	(0.00)	0.090
5:30 PM-5:45 PM	St Athan Road	198.18	1101.15	0.180	0.00	0.22	0.22	3.28	(0.00)	0.066
5:45 PM-6:00 PM	Site Access	41.35	915.24	0.045	0.00	0.06	0.05	0.72	(0.00)	0.069
5:45 PM-6:00 PM	Cowbridge Road	212.16	1115.38	0.190	0.00	0.30	0.24	3.60	(0.00)	0.066
5:45 PM-6:00 PM	Eglwys Brewis Road	111.47	814.07	0.137	0.00	0.20	0.16	2.44	(0.00)	0.085
5:45 PM-6:00 PM	St Athan Road	161.82	1118.86	0.145	0.00	0.22	0.17	2.59	(0.00)	0.063
6:00 PM-6:15 PM	Site Access	34.63	935.68	0.037	0.00	0.05	0.04	0.59	(0.00)	0.067
6:00 PM-6:15 PM	Cowbridge Road	177.67	1119.53	0.159	0.00	0.24	0.19	2.89	(0.00)	0.064
6:00 PM-6:15 PM	Eglwys Brewis Road	93.35	823.54	0.113	0.00	0.16	0.13	1.96	(0.00)	0.082
6:00 PM-6:15 PM	St Athan Road	135.51	1131.79	0.120	0.00	0.17	0.14	2.08	(0.00)	0.060



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Highways & Transportation

# Appendix 12

<b>PICADY</b>		
GUI Version: 5.1 AE Analysis Program Release: 5.0 (MAY 2010)		
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<b>The user of this computer program for the solution of an engineering problem is in no way relieved of their responsibility for the correctness of the solution</b>		

## Run Analysis

Parameter	Values
File Run	Z:\..\Gileston Road\Secondary Access.vpi
Date Run	06 October 2017
Time Run	9:44:32 AM
Driving Side	Drive On The Left

## Arm Names and Flow Scaling Factors

Arm	Arm Name	Flow Scaling Factor (%)
Arm A	Cowbridge Road (N)	100
Arm B	Site Access	100
Arm C	Cowbridge Road (S)	100

## Stream Labelling Convention

Stream A-B contains traffic going from A to B etc.

## Run Information

Parameter	Values
Run Title	Secondary Access
Location	-
Date	06 August 2017
Enumerator	Administrator [ALUNREES41AF]
Job Number	-
Status	-
Client	-
Description	-

## Errors and Warnings

Parameter	Values
Warning	No Errors Or Warnings

## Geometric Data

### Geometric Parameters

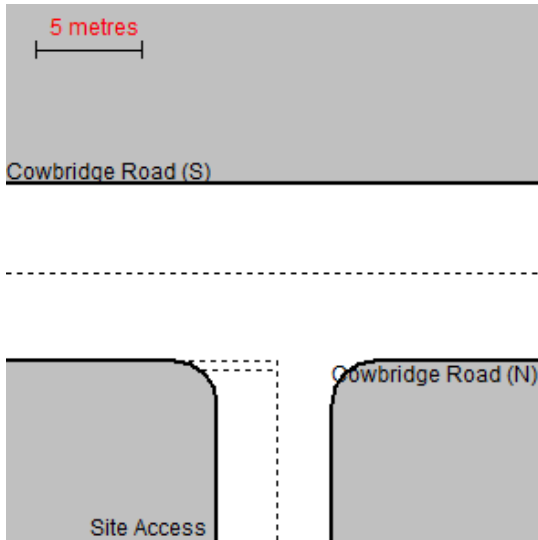
Parameter	Minor Arm B
Major Road Carriageway Width (m)	6.00
Major Road Kerbed Central Reserve Width (m)	0.00
Major Road Right Turning Lane Width (m)	2.20
Minor Road First Lane Width (m)	2.75
Minor Road Visibility To Right (m)	30
Minor Road Visibility To Left (m)	30
Major Road Right Turn Visibility (m)	50
Major Road Right Turn Blocks Traffic	Yes (if over 0 veh)

### Slope and Intercept Values

Stream	Intercept for Stream	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B-A	489.488	0.089	0.225	0.142	0.322
B-C	626.733	0.096	0.243	-	-
C-B	602.919	0.234	0.234	-	-

Note: Streams may be combined in which case capacity will be adjusted  
These values do not allow for any site-specific corrections

## Junction Diagram



## Demand Data

### Modelling Periods

Parameter	Period	Duration (min)	Segment Length (min)
First Modelling Period	07:45-09:15	90	15
Second Modelling Period	16:45-18:15	90	15

### ODTAB Turning Counts

**Demand Set:** AM Peak Hour

**Modelling Period:** 07:45-09:15

From/To	Arm A	Arm B	Arm C
Arm A	0.0	1.0	249.0
Arm B	4.0	0.0	6.0
Arm C	310.0	2.0	0.0

**Demand Set:** PM Peak Hour**Modelling Period:** 16:45-18:15

From/To	Arm A	Arm B	Arm C
Arm A	0.0	3.0	260.0
Arm B	3.0	0.0	2.0
Arm C	234.0	5.0	0.0

**ODTAB Synthesised Flows****Demand Set:** AM Peak Hour**Modelling Period:** 07:45-09:15

Arm	Rising Time	Rising Flow (veh/min)	Peak Time	Peak Flow (veh/min)	Falling Time	Falling Flow (veh/min)
Arm A	08:00	3.125	08:30	4.688	09:00	3.125
Arm B	08:00	0.125	08:30	0.188	09:00	0.125
Arm C	08:00	3.900	08:30	5.850	09:00	3.900

**Heavy Vehicles Percentages****Demand Set:** AM Peak Hour**Modelling Period:** 07:45-09:15

From/To	Arm A	Arm B	Arm C
Arm A	-	10.0	10.0
Arm B	10.0	-	10.0
Arm C	10.0	10.0	-

**Demand Set:** PM Peak Hour**Modelling Period:** 16:45-18:15

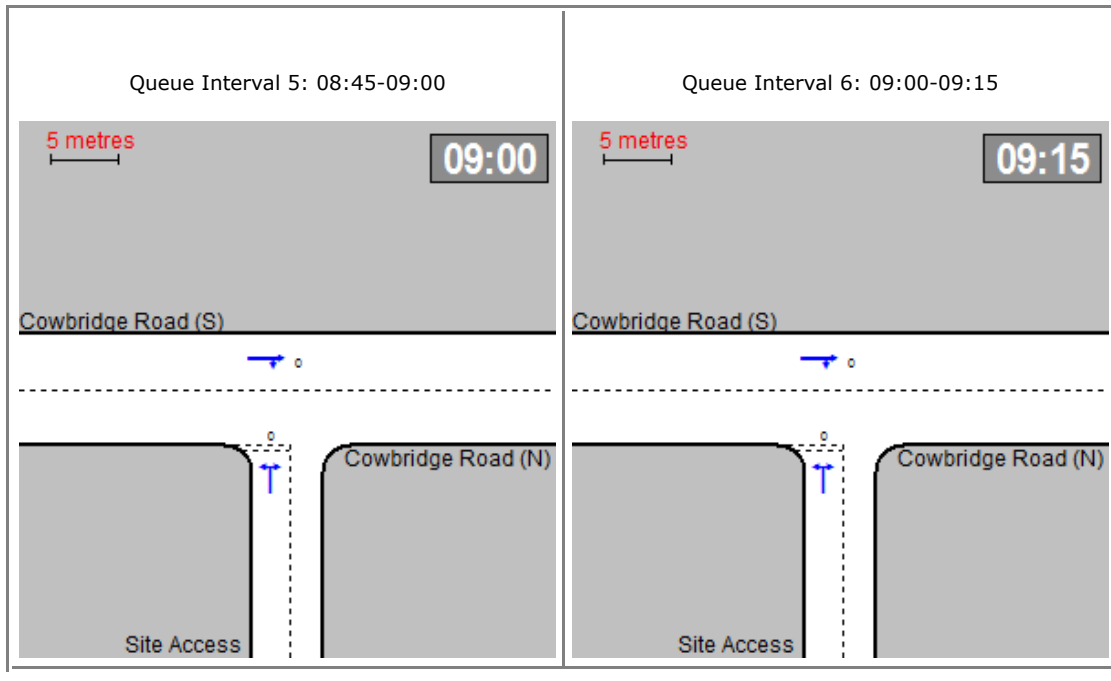
From/To	Arm A	Arm B	Arm C
Arm A	-	10.0	10.0
Arm B	10.0	-	10.0
Arm C	10.0	10.0	-

Default proportions of heavy vehicles are used

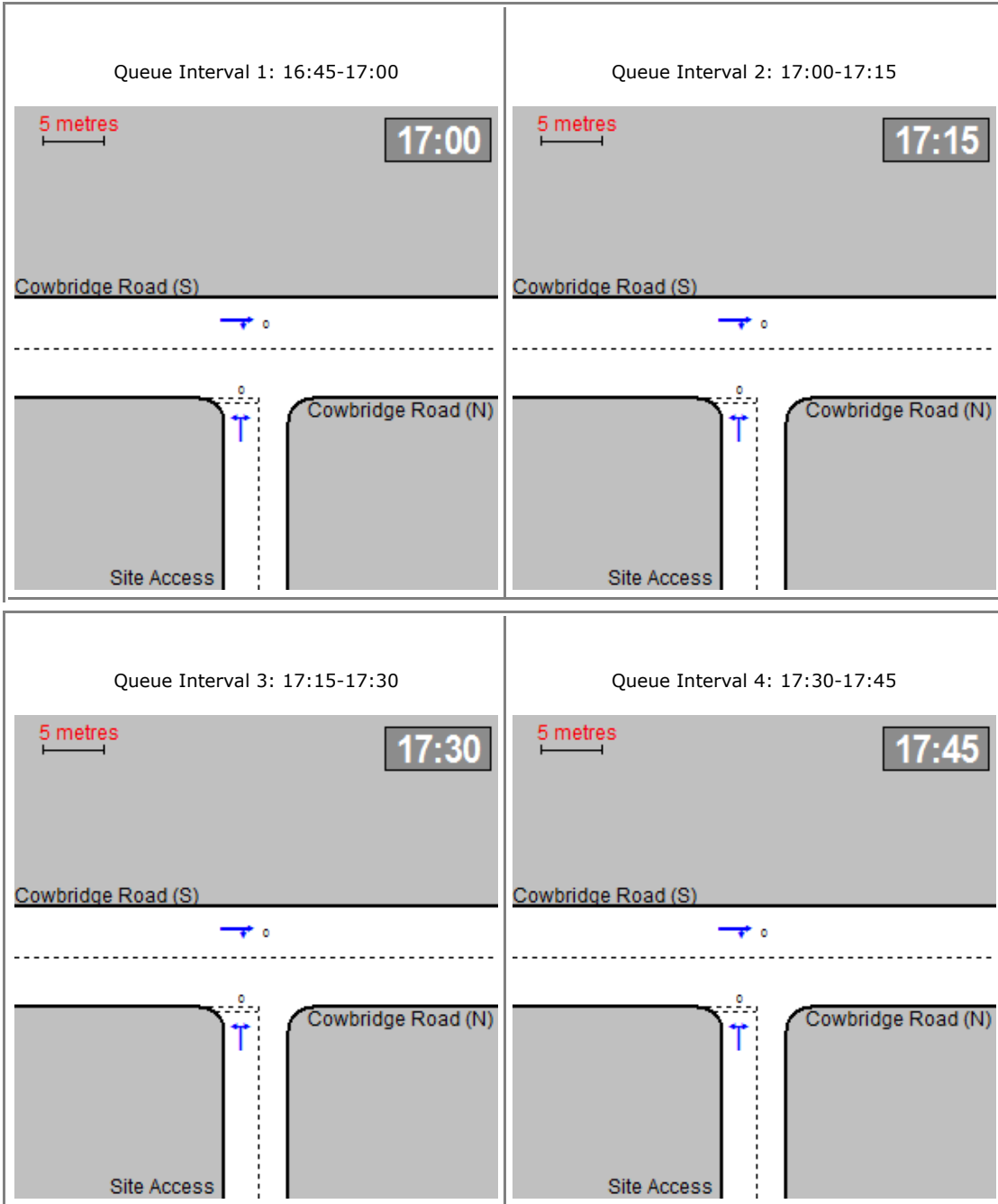
### Queue Diagrams

**Demand Set:** AM Peak Hour  
**Modelling Period:** 07:45-09:15  
**View Extent:** 40m

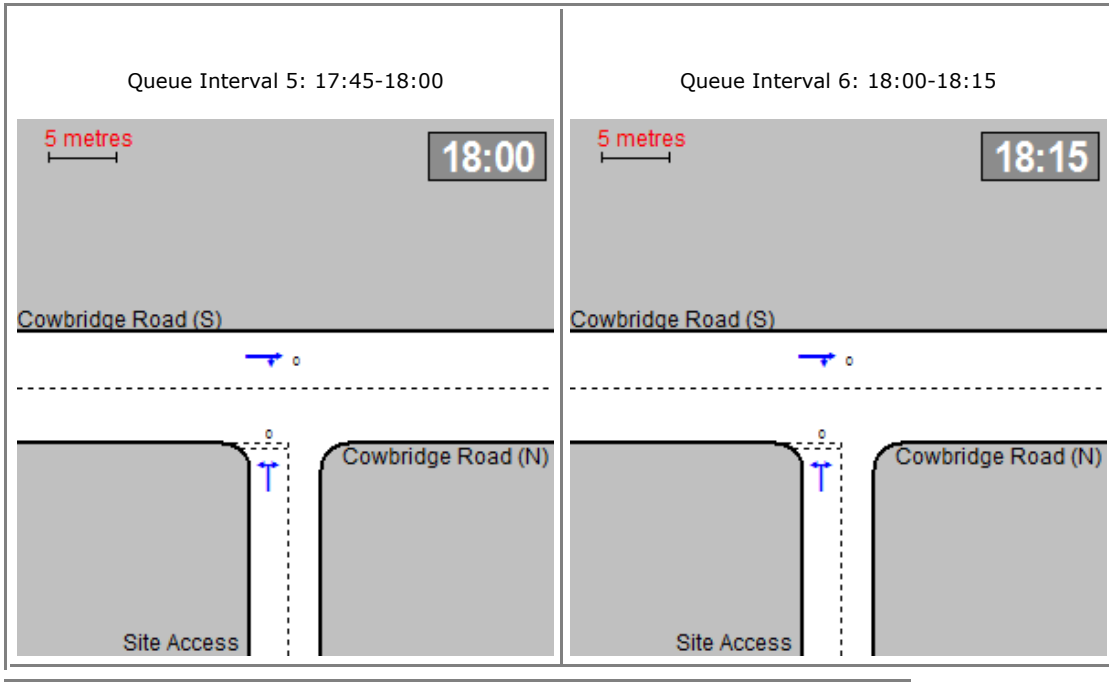




**Demand Set:** PM Peak Hour  
**Modelling Period:** 16:45-18:15  
**View Extent:** 40m

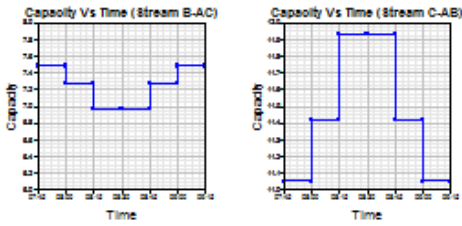




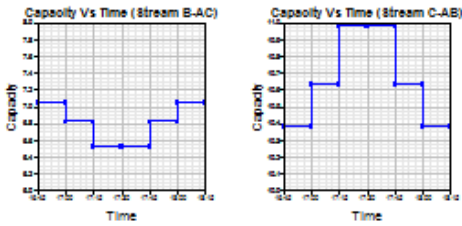


### Capacity Graph

**Demand Set:** AM Peak Hour  
**Modelling Period:** 07:45-09:15

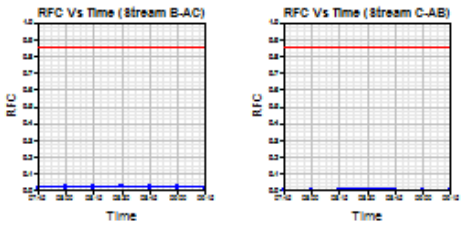


**Demand Set:** PM Peak Hour  
**Modelling Period:** 16:45-18:15

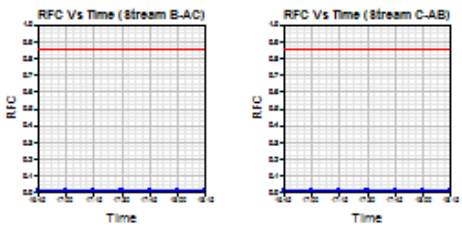


### RFC Graph

**Demand Set:** AM Peak Hour  
**Modelling Period:** 07:45-09:15

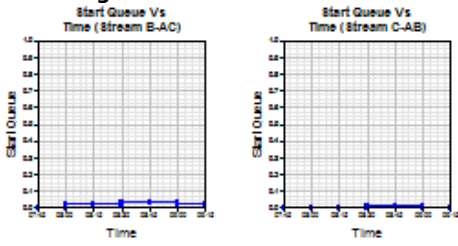


**Demand Set:** PM Peak Hour  
**Modelling Period:** 16:45-18:15

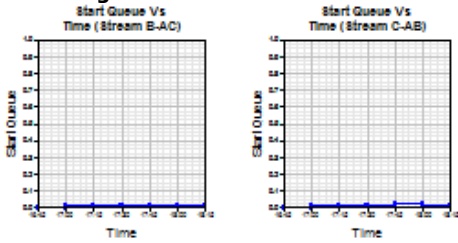


### Start Queue Graph

**Demand Set:** AM Peak Hour  
**Modelling Period:** 07:45-09:15

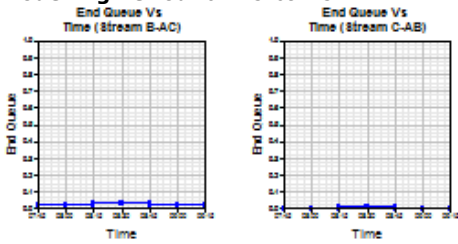


**Demand Set:** PM Peak Hour  
**Modelling Period:** 16:45-18:15

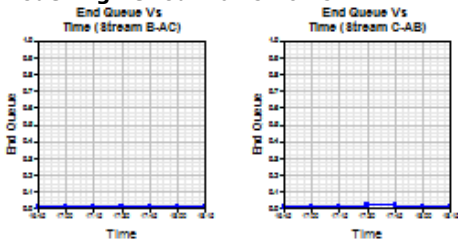


### End Queue Graph

**Demand Set:** AM Peak Hour  
**Modelling Period:** 07:45-09:15

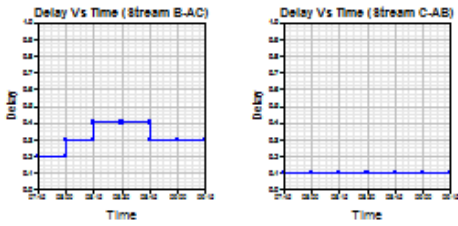


**Demand Set:** PM Peak Hour  
**Modelling Period:** 16:45-18:15

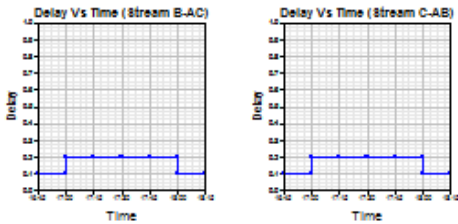


### Delay Graph

**Demand Set:** AM Peak Hour  
**Modelling Period:** 07:45-09:15



**Demand Set:** PM Peak Hour  
**Modelling Period:** 16:45-18:15



### Queues & Delays

**Demand Set:** AM Peak Hour  
**Modelling Period:** 07:45-09:15

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
07:45-08:00	B-AC	0.13	7.48	0.017	-	0.00	0.02	-	0.2	0.14
	C-AB	0.04	11.05	0.003	-	0.00	0.00	-	0.1	0.09
	C-A	3.88	-	-	-	-	-	-	-	-
	A-B	0.01	-	-	-	-	-	-	-	-
	A-C	3.12	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
08:00-08:15	B-AC	0.15	7.27	0.021	-	0.02	0.02	-	0.3	0.14
	C-AB	0.05	11.42	0.004	-	0.00	0.00	-	0.1	0.09
	C-A	4.63	-	-	-	-	-	-	-	-
	A-B	0.01	-	-	-	-	-	-	-	-
	A-C	3.73	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
08:15-08:30	B-AC	0.18	6.97	0.026	-	0.02	0.03	-	0.4	0.15
	C-AB	0.07	11.93	0.006	-	0.00	0.01	-	0.1	0.08
	C-A	5.66	-	-	-	-	-	-	-	-
	A-B	0.02	-	-	-	-	-	-	-	-
	A-C	4.57	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
08:30-08:45	B-AC	0.18	6.97	0.026	-	0.03	0.03	-	0.4	0.15
	C-AB	0.07	11.93	0.006	-	0.01	0.01	-	0.1	0.08
	C-A	5.66	-	-	-	-	-	-	-	-
	A-B	0.02	-	-	-	-	-	-	-	-
	A-C	4.57	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
08:45-09:00	B-AC	0.15	7.27	0.021	-	0.03	0.02	-	0.3	0.14
	C-AB	0.05	11.42	0.004	-	0.01	0.00	-	0.1	0.09
	C-A	4.63	-	-	-	-	-	-	-	-
	A-B	0.01	-	-	-	-	-	-	-	-
	A-C	3.73	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
09:00-09:15	B-AC	0.13	7.48	0.017	-	0.02	0.02	-	0.3	0.14
	C-AB	0.04	11.05	0.003	-	0.00	0.00	-	0.1	0.09
	C-A	3.88	-	-	-	-	-	-	-	-
	A-B	0.01	-	-	-	-	-	-	-	-
	A-C	3.12	-	-	-	-	-	-	-	-

**Demand Set:** PM Peak Hour**Modelling Period:** 16:45-18:15

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
16:45-17:00	B-AC	0.06	7.04	0.009	-	0.00	0.01	-	0.1	0.14
	C-AB	0.09	10.38	0.008	-	0.00	0.01	-	0.1	0.10
	C-A	2.91	-	-	-	-	-	-	-	-
	A-B	0.04	-	-	-	-	-	-	-	-
	A-C	3.26	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
17:00-17:15	B-AC	0.07	6.82	0.011	-	0.01	0.01	-	0.2	0.15
	C-AB	0.11	10.63	0.010	-	0.01	0.01	-	0.2	0.10
	C-A	3.47	-	-	-	-	-	-	-	-
	A-B	0.04	-	-	-	-	-	-	-	-
	A-C	3.90	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
17:15-17:30	B-AC	0.09	6.52	0.014	-	0.01	0.01	-	0.2	0.16
	C-AB	0.15	10.98	0.013	-	0.01	0.01	-	0.2	0.09
	C-A	4.24	-	-	-	-	-	-	-	-
	A-B	0.06	-	-	-	-	-	-	-	-
	A-C	4.77	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
17:30-17:45	B-AC	0.09	6.52	0.014	-	0.01	0.01	-	0.2	0.16
	C-AB	0.15	10.98	0.013	-	0.01	0.02	-	0.2	0.09
	C-A	4.24	-	-	-	-	-	-	-	-
	A-B	0.06	-	-	-	-	-	-	-	-
	A-C	4.77	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
17:45-18:00	B-AC	0.07	6.82	0.011	-	0.01	0.01	-	0.2	0.15
	C-AB	0.11	10.63	0.010	-	0.02	0.01	-	0.2	0.10
	C-A	3.47	-	-	-	-	-	-	-	-
	A-B	0.04	-	-	-	-	-	-	-	-
	A-C	3.90	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
18:00-18:15	B-AC	0.06	7.04	0.009	-	0.01	0.01	-	0.1	0.14
	C-AB	0.09	10.38	0.008	-	0.01	0.01	-	0.1	0.10
	C-A	2.91	-	-	-	-	-	-	-	-
	A-B	0.04	-	-	-	-	-	-	-	-
	A-C	3.26	-	-	-	-	-	-	-	-

Entry capacities marked with an '(X)' are dominated by a pedestrian crossing in that time segment.

In time segments marked with a '(B)', traffic leaving the junction may block back from a crossing so impairing normal operation of the junction.

Delays marked with '###' could not be calculated.

## Overall Queues & Delays

### Queueing Delay Information Over Whole Period

**Demand Set:** AM Peak Hour

**Modelling Period:** 07:45-09:15

Stream	Total Demand (veh)	Total Demand (veh/h)	Queueing Delay (min)	Queueing Delay (min/veh)	Inclusive Delay (min)	Inclusive Delay (min/veh)
B-AC	13.8	9.2	1.9	0.1	1.9	0.1
C-AB	4.6	3.0	0.4	0.1	0.4	0.1
C-A	424.9	283.3	-	-	-	-
A-B	1.4	0.9	-	-	-	-
A-C	342.7	228.5	-	-	-	-
<b>All</b>	<b>787.3</b>	<b>524.9</b>	<b>2.3</b>	<b>0.0</b>	<b>2.3</b>	<b>0.0</b>

**Demand Set:** PM Peak Hour**Modelling Period:** 16:45-18:15

<b>Stream</b>	<b>Total Demand (veh)</b>	<b>Total Demand (veh/h)</b>	<b>Queueing Delay (min)</b>	<b>Queueing Delay (min/veh)</b>	<b>Inclusive Delay (min)</b>	<b>Inclusive Delay (min/veh)</b>
B-AC	6.9	4.6	1.0	0.1	1.0	0.1
C-AB	10.3	6.8	1.1	0.1	1.1	0.1
C-A	318.7	212.5	-	-	-	-
A-B	4.1	2.8	-	-	-	-
A-C	357.9	238.6	-	-	-	-
<b>All</b>	<b>697.8</b>	<b>465.2</b>	<b>2.1</b>	<b>0.0</b>	<b>2.1</b>	<b>0.0</b>

Delay is that occurring only within the time period.

Inclusive delay includes delay suffered by vehicles which are still queuing after the end of the time period.

These will only be significantly different if there is a large queue remaining at the end of the time period.


### **PICADY 5 Run Successful**



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Priffyrdd a Thrafnidiaeth  
Highways & Transportation

# Appendix 13

<b>PICADY</b>		
GUI Version: 5.1 AE Analysis Program Release: 5.0 (MAY 2010)		
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<b>The user of this computer program for the solution of an engineering problem is in no way relieved of their responsibility for the correctness of the solution</b>		

## Run Analysis

Parameter	Values
File Run	Z:\..\Gileston Road\Gileston Rd.vpi
Date Run	06 October 2017
Time Run	9:59:25 AM
Driving Side	Drive On The Left

## Arm Names and Flow Scaling Factors

Arm	Arm Name	Flow Scaling Factor (%)
Arm A	B4265 (E)	100
Arm B	Gileston Rd (S)	100
Arm C	B4265 (W)	100
Arm D	Gileston Road (N)	100

## Stream Labelling Convention

Stream A-B contains traffic going from A to B etc.

## Run Information

Parameter	Values
Run Title	Gileston Rd / B4265
Location	-
Date	06 June 2017
Enumerator	Administrator [ALUNREES41AF]
Job Number	-
Status	-
Client	-
Description	-

## Errors and Warnings

Parameter	Values
Warning	No Errors Or Warnings

## Geometric Data

### Geometric Parameters

Parameter	Minor Arm B	Minor Arm D
Major Road Carriageway Width (m)	9.00	6.00
Major Road Kerbed Central Reserve Width (m)	0.00	0.00
Major Road Right Turning Lane Width (m)	3.00	3.00
Minor Road First Lane Width (m)	2.50	3.60
Minor Road Visibility To Right (m)	50	50
Minor Road Visibility To Left (m)	30	50
Major Road Right Turn Visibility (m)	50	50
Major Road Right Turn Blocks Traffic	Yes (if over 2 veh)	Yes (if over 3 veh)

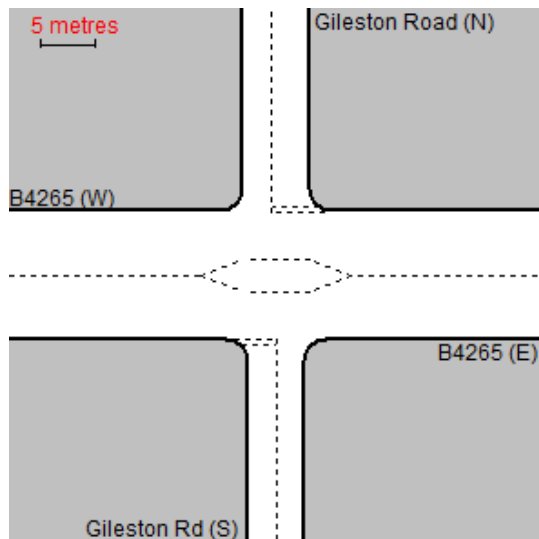
### Slope and Intercept Values

Stream	Intercept for Stream	Slope for A-B	Slope for A-C	Slope for A-D	Slope for B-A	Slope for B-C	Slope for B-D	Slope for C-A	Slope for C-B	Slope for C-D	Slope for D-A	Slope for D-B	Slope for D-C
C-B	655.413	0.221	0.221	0.315	-	-	-	-	-	-	-	-	-
A-D	655.413	-	-	-	-	-	-	0.221	0.315	0.221	-	-	-
B-A	486.263	0.077	0.195	0.195	-	-	-	0.122	0.278	-	0.195	0.195	0.097
B-C	622.604	0.083	0.210	-	-	-	-	-	-	-	-	-	-
B-D(L)	486.263	0.077	0.195	0.195	-	-	-	0.122	0.278	0.122	-	-	-
D-A	694.784	-	-	-	-	-	-	0.234	-	0.093	-	-	-
D-B(L)	549.654	0.138	0.138	0.314	-	-	-	0.220	0.220	0.087	-	-	-
D-C	549.654	-	0.138	0.314	0.110	0.220	0.220	0.220	0.220	0.087	-	-	-
B-D(R)	486.263	0.077	0.195	0.195	-	-	-	0.122	0.278	0.122	-	-	-
D-B(R)	549.654	0.138	0.138	0.314	-	-	-	0.220	0.220	0.087	-	-	-

Note: Streams may be combined in which case capacity will be adjusted  
These values do not allow for any site-specific corrections

Streams marked with '(L)' and '(R)' refer to the 'left' and 'right' lane of the minor arm that the originating traffic is on.

## Junction Diagram



## Demand Data

### Modelling Periods

Parameter	Period	Duration (min)	Segment Length (min)
First Modelling Period	08:00-09:00	60	15
Second Modelling Period	17:00-18:00	60	15

### Direct Entry Flows

**Demand Set:** Observed 2017 AM

**Modelling Period:** 08:00-09:00

**Segment:** 08:00-08:15

Arm	Flow (veh/min)
Arm A	6.60
Arm B	0.30
Arm C	5.97
Arm D	6.78

**Segment:** 08:15-08:30

Arm	Flow (veh/min)
Arm A	6.60
Arm B	0.30
Arm C	5.97
Arm D	6.78

**Segment:** 08:30-08:45

Arm	Flow (veh/min)
Arm A	6.60
Arm B	0.30
Arm C	5.97
Arm D	6.78

**Segment:** 08:45-09:00

Arm	Flow (veh/min)
Arm A	6.60
Arm B	0.30
Arm C	5.97
Arm D	6.78

**Demand Set:** Observed 2017 PM

**Modelling Period:** 17:00-18:00

**Segment:** 17:00-17:15

Arm	Flow (veh/min)
Arm A	9.05
Arm B	0.28
Arm C	6.08
Arm D	2.93

**Segment:** 17:15-17:30

<b>Arm</b>	<b>Flow (veh/min)</b>
Arm A	9.05
Arm B	0.28
Arm C	6.08
Arm D	2.93

**Segment:** 17:30-17:45

<b>Arm</b>	<b>Flow (veh/min)</b>
Arm A	9.05
Arm B	0.28
Arm C	6.08
Arm D	2.93

**Segment:** 17:45-18:00

<b>Arm</b>	<b>Flow (veh/min)</b>
Arm A	9.05
Arm B	0.28
Arm C	6.08
Arm D	2.93

**Demand Set:** 2027 Baseline AM**Modelling Period:** 08:00-09:00**Segment:** 08:00-08:15

<b>Arm</b>	<b>Flow (veh/min)</b>
Arm A	7.66
Arm B	0.34
Arm C	6.64
Arm D	7.02

**Segment:** 08:15-08:30

<b>Arm</b>	<b>Flow (veh/min)</b>
Arm A	7.66
Arm B	0.34
Arm C	6.64
Arm D	7.02

**Segment:** 08:30-08:45

<b>Arm</b>	<b>Flow (veh/min)</b>
Arm A	7.66
Arm B	0.34
Arm C	6.64
Arm D	7.02

**Segment:** 08:45-09:00

Arm	Flow (veh/min)
Arm A	7.66
Arm B	0.34
Arm C	6.64
Arm D	7.02

**Demand Set:** 2027 Baseline PM

**Modelling Period:** 17:00-18:00

**Segment:** 17:00-17:15

Arm	Flow (veh/min)
Arm A	10.65
Arm B	0.32
Arm C	6.83
Arm D	3.44

**Segment:** 17:15-17:30

Arm	Flow (veh/min)
Arm A	10.65
Arm B	0.32
Arm C	6.83
Arm D	3.44

**Segment:** 17:30-17:45

Arm	Flow (veh/min)
Arm A	10.65
Arm B	0.32
Arm C	6.83
Arm D	3.44

**Segment:** 17:45-18:00

Arm	Flow (veh/min)
Arm A	10.65
Arm B	0.32
Arm C	6.83
Arm D	3.44

**Demand Set:** 2027 Baseline + Development AM

**Modelling Period:** 08:00-09:00

**Segment:** 08:00-08:15

Arm	Flow (veh/min)
Arm A	7.93
Arm B	0.34
Arm C	6.64
Arm D	7.96

**Segment:** 08:15-08:30

Arm	Flow (veh/min)
Arm A	7.93
Arm B	0.34
Arm C	6.64
Arm D	7.96

**Segment:** 08:30-08:45

Arm	Flow (veh/min)
Arm A	7.93
Arm B	0.34
Arm C	6.64
Arm D	7.96

**Segment:** 08:45-09:00

Arm	Flow (veh/min)
Arm A	7.93
Arm B	0.34
Arm C	6.64
Arm D	7.96

**Demand Set:** 2027 Baseline+ Development PM

**Modelling Period:** 17:00-18:00

**Segment:** 17:00-17:15

Arm	Flow (veh/min)
Arm A	11.44
Arm B	0.32
Arm C	6.83
Arm D	3.95



**Segment: 17:15-17:30**

Arm	Flow (veh/min)
Arm A	11.44
Arm B	0.32
Arm C	6.83
Arm D	3.95

**Segment: 17:30-17:45**

Arm	Flow (veh/min)
Arm A	11.44
Arm B	0.32
Arm C	6.83
Arm D	3.95

**Segment: 17:45-18:00**

Arm	Flow (veh/min)
Arm A	11.44
Arm B	0.32
Arm C	6.83
Arm D	3.95

**Turning Counts**

**Demand Set:** Observed 2017 AM

**Modelling Period:** 08:00-09:00

From/To	Arm A	Arm B	Arm C	Arm D
Arm A	-	2	278	116
Arm B	9	-	8	1
Arm C	316	5	-	37
Arm D	180	3	224	-

**Demand Set:** Observed 2017 PM

**Modelling Period:** 17:00-18:00

From/To	Arm A	Arm B	Arm C	Arm D
Arm A	-	5	349	189
Arm B	6	-	6	5
Arm C	329	3	-	33
Arm D	136	9	31	-

**Demand Set:** 2027 Baseline AM

**Modelling Period:** 08:00-09:00

From/To	Arm A	Arm B	Arm C	Arm D
Arm A	-	2	316	141
Arm B	9	-	10	1
Arm C	359	6	-	33
Arm D	224	3	194	-

**Demand Set:** 2027 Baseline PM

**Modelling Period:** 17:00-18:00

From/To	Arm A	Arm B	Arm C	Arm D
Arm A	-	6	397	236
Arm B	7	-	7	6
Arm C	374	3	-	32
Arm D	168	10	29	-

**Demand Set:** 2027 Baseline + Development AM

**Modelling Period:** 08:00-09:00

From/To	Arm A	Arm B	Arm C	Arm D
Arm A	-	2	316	157
Arm B	9	-	10	1
Arm C	359	6	-	33
Arm D	280	3	194	-

**Demand Set:** 2027 Baseline+ Development PM

**Modelling Period:** 17:00-18:00

From/To	Arm A	Arm B	Arm C	Arm D
Arm A	-	6	397	284
Arm B	7	-	7	6
Arm C	374	3	-	32
Arm D	198	10	29	-

Turning proportions are calculated from turning count data

### Turning Proportions

**Demand Set:** Observed 2017 AM

**Modelling Period:** 08:00-09:00

From/To	Arm A	Arm B	Arm C	Arm D
Arm A	0.000	0.005	0.702	0.293
Arm B	0.500	0.000	0.444	0.056
Arm C	0.883	0.014	0.000	0.103
Arm D	0.442	0.007	0.550	0.000

**Demand Set:** Observed 2017 PM**Modelling Period:** 17:00-18:00

From/To	Arm A	Arm B	Arm C	Arm D
Arm A	0.000	0.009	0.643	0.348
Arm B	0.353	0.000	0.353	0.294
Arm C	0.901	0.008	0.000	0.090
Arm D	0.773	0.051	0.176	0.000

**Demand Set:** 2027 Baseline AM**Modelling Period:** 08:00-09:00

From/To	Arm A	Arm B	Arm C	Arm D
Arm A	0.000	0.004	0.688	0.307
Arm B	0.450	0.000	0.500	0.050
Arm C	0.902	0.015	0.000	0.083
Arm D	0.532	0.007	0.461	0.000

**Demand Set:** 2027 Baseline PM**Modelling Period:** 17:00-18:00

From/To	Arm A	Arm B	Arm C	Arm D
Arm A	0.000	0.009	0.621	0.369
Arm B	0.350	0.000	0.350	0.300
Arm C	0.914	0.007	0.000	0.078
Arm D	0.812	0.048	0.140	0.000

**Demand Set:** 2027 Baseline + Development AM**Modelling Period:** 08:00-09:00

From/To	Arm A	Arm B	Arm C	Arm D
Arm A	0.000	0.004	0.665	0.331
Arm B	0.450	0.000	0.500	0.050
Arm C	0.902	0.015	0.000	0.083
Arm D	0.587	0.006	0.407	0.000

**Demand Set:** 2027 Baseline+ Development PM**Modelling Period:** 17:00-18:00

From/To	Arm A	Arm B	Arm C	Arm D
Arm A	0.000	0.009	0.578	0.413
Arm B	0.350	0.000	0.350	0.300
Arm C	0.914	0.007	0.000	0.078
Arm D	0.835	0.042	0.122	0.000

### Heavy Vehicles Percentages

**Demand Set:** Observed 2017 AM

**Modelling Period:** 08:00-09:00

From/To	Arm A	Arm B	Arm C	Arm D
Arm A	-	10.0	10.0	10.0
Arm B	10.0	-	10.0	10.0
Arm C	10.0	10.0	-	10.0
Arm D	10.0	10.0	10.0	-

**Demand Set:** Observed 2017 PM

**Modelling Period:** 17:00-18:00

From/To	Arm A	Arm B	Arm C	Arm D
Arm A	-	10.0	10.0	10.0
Arm B	10.0	-	10.0	10.0
Arm C	10.0	10.0	-	10.0
Arm D	10.0	10.0	10.0	-

**Demand Set:** 2027 Baseline AM

**Modelling Period:** 08:00-09:00

From/To	Arm A	Arm B	Arm C	Arm D
Arm A	-	10.0	10.0	10.0
Arm B	10.0	-	10.0	10.0
Arm C	10.0	10.0	-	10.0
Arm D	10.0	10.0	10.0	-

**Demand Set:** 2027 Baseline PM

**Modelling Period:** 17:00-18:00

From/To	Arm A	Arm B	Arm C	Arm D
Arm A	-	10.0	10.0	10.0
Arm B	10.0	-	10.0	10.0
Arm C	10.0	10.0	-	10.0
Arm D	10.0	10.0	10.0	-

**Demand Set:** 2027 Baseline + Development AM

**Modelling Period:** 08:00-09:00

From/To	Arm A	Arm B	Arm C	Arm D
Arm A	-	10.0	10.0	10.0
Arm B	10.0	-	10.0	10.0
Arm C	10.0	10.0	-	10.0
Arm D	10.0	10.0	10.0	-

**Demand Set:** 2027 Baseline+ Development PM

**Modelling Period:** 17:00-18:00

<b>From/To</b>	<b>Arm A</b>	<b>Arm B</b>	<b>Arm C</b>	<b>Arm D</b>
Arm A	-	10.0	10.0	10.0
Arm B	10.0	-	10.0	10.0
Arm C	10.0	10.0	-	10.0
Arm D	10.0	10.0	10.0	-

Default proportions of heavy vehicles are used

### Queue Diagrams

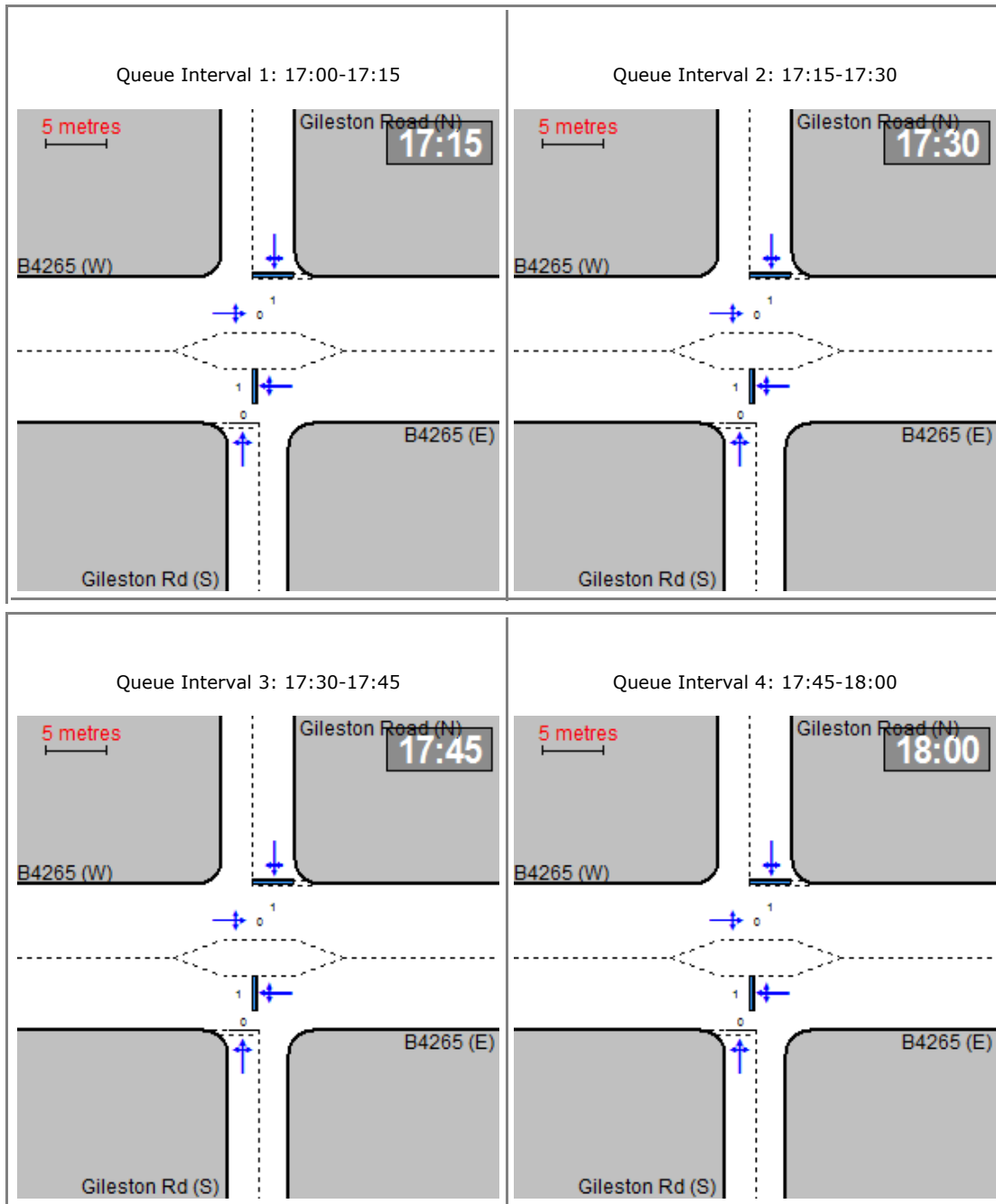
**Demand Set:** Observed 2017 AM  
**Modelling Period:** 08:00-09:00  
**View Extent:** 58m



**Demand Set:** Observed 2017 PM

**Modelling Period:** 17:00-18:00

**View Extent:** 40m



**Demand Set:** 2027 Baseline AM

**Modelling Period:** 08:00-09:00

**View Extent:** 76m

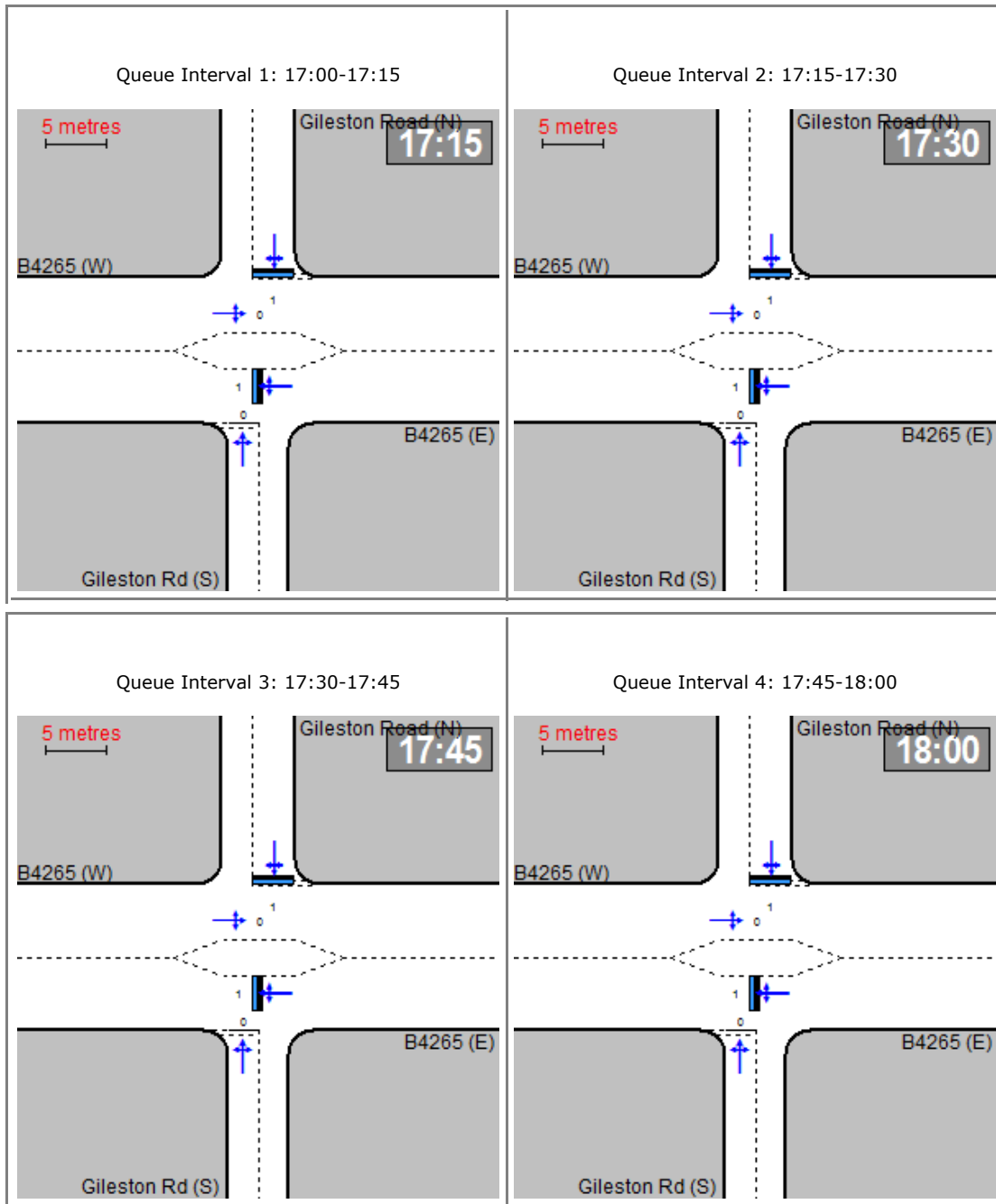




**Demand Set:** 2027 Baseline PM

**Modelling Period:** 17:00-18:00

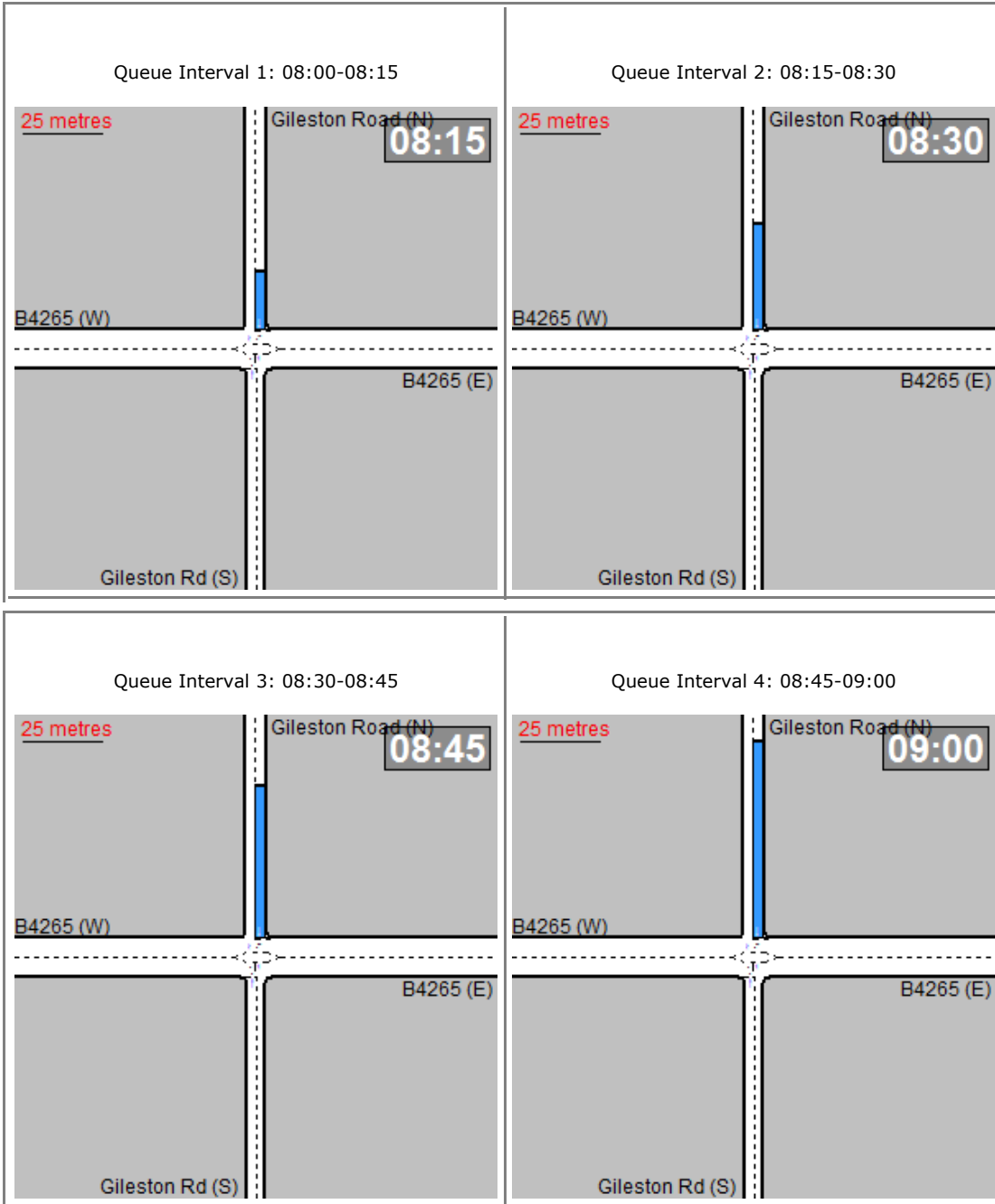
**View Extent:** 40m



**Demand Set:** 2027 Baseline + Development AM

**Modelling Period:** 08:00-09:00

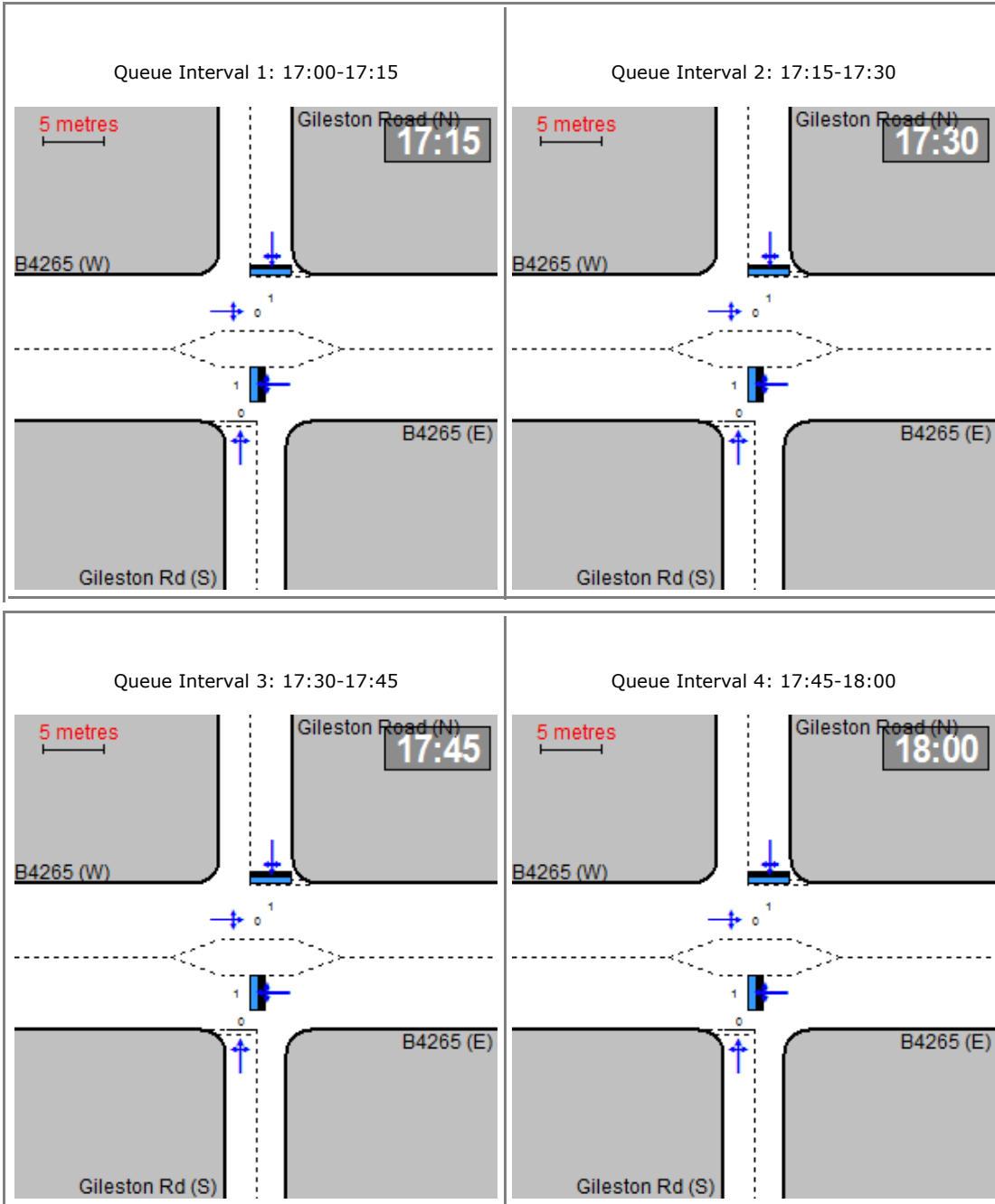
**View Extent:** 153m



**Demand Set:** 2027 Baseline+ Development PM

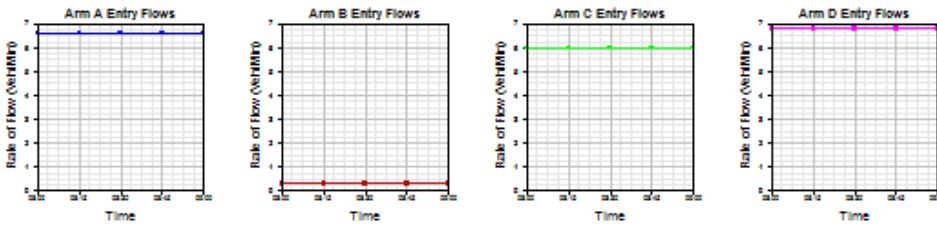
**Modelling Period:** 17:00-18:00

**View Extent:** 40m

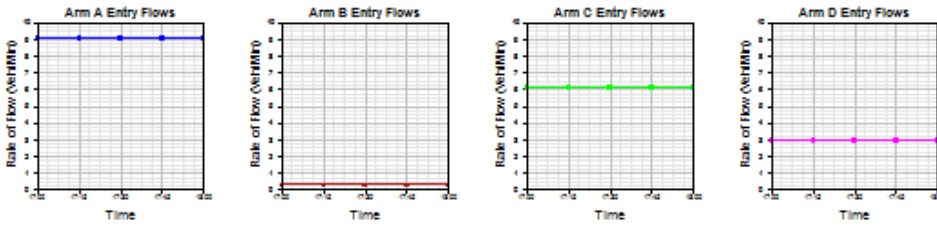


### Demand Data Graph

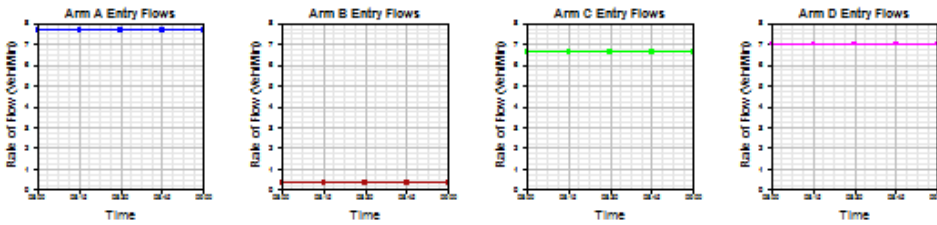
**Demand Set:** Observed 2017 AM  
**Modelling Period:** 08:00-09:00



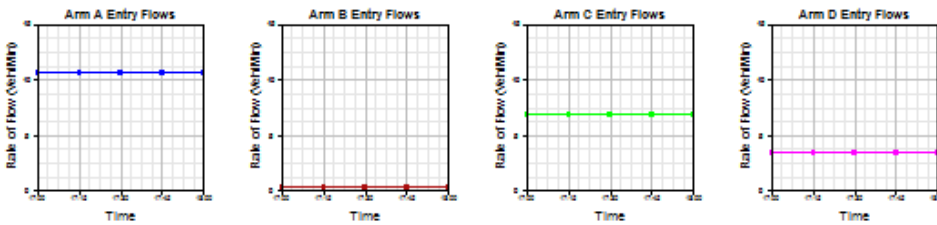
**Demand Set:** Observed 2017 PM  
**Modelling Period:** 17:00-18:00



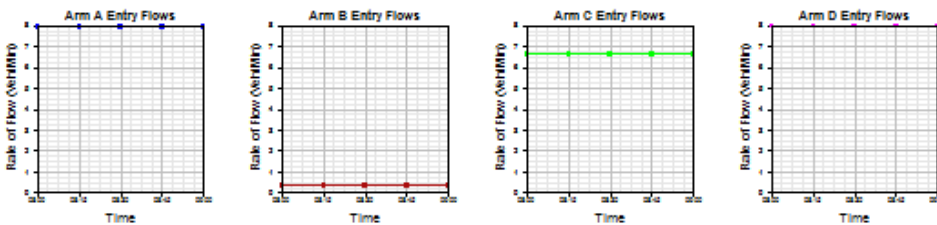
**Demand Set:** 2027 Baseline AM  
**Modelling Period:** 08:00-09:00



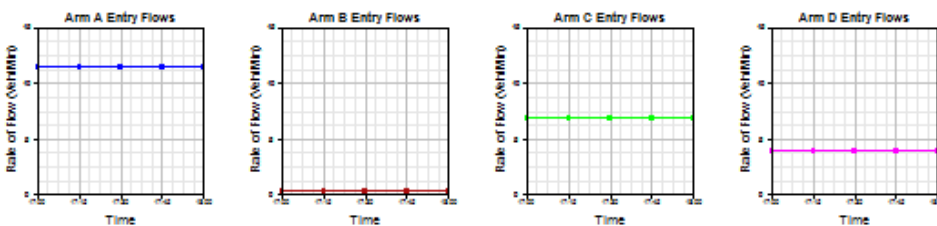
**Demand Set:** 2027 Baseline PM  
**Modelling Period:** 17:00-18:00



**Demand Set:** 2027 Baseline + Development AM  
**Modelling Period:** 08:00-09:00

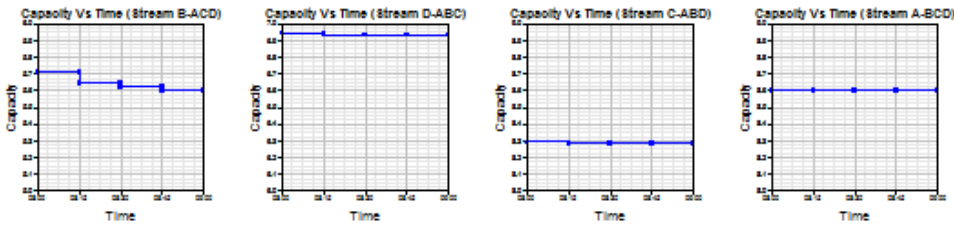


**Demand Set:** 2027 Baseline+ Development PM  
**Modelling Period:** 17:00-18:00

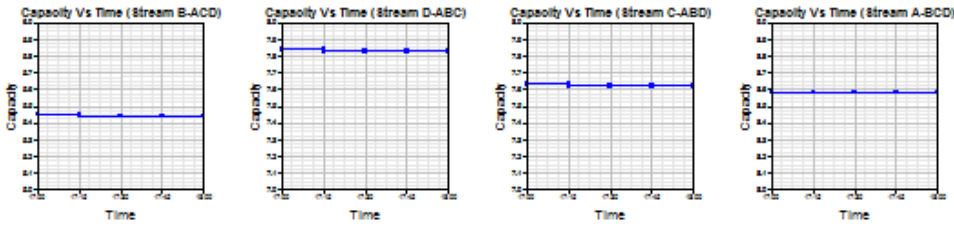


## Capacity Graph

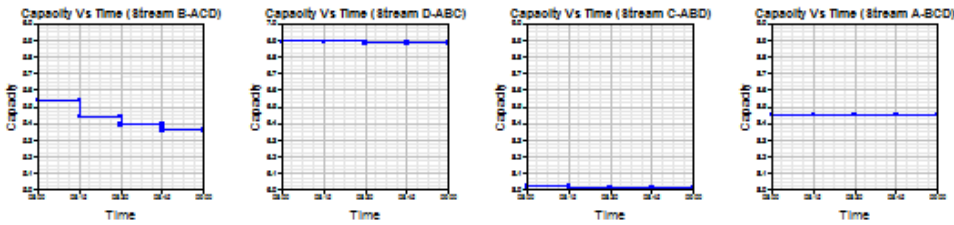
**Demand Set:** Observed 2017 AM  
**Modelling Period:** 08:00-09:00



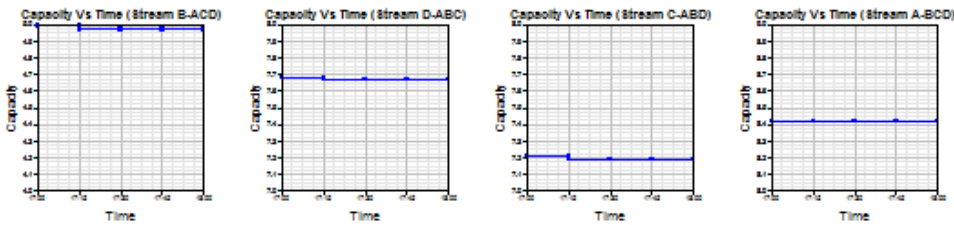
**Demand Set:** Observed 2017 PM  
**Modelling Period:** 17:00-18:00



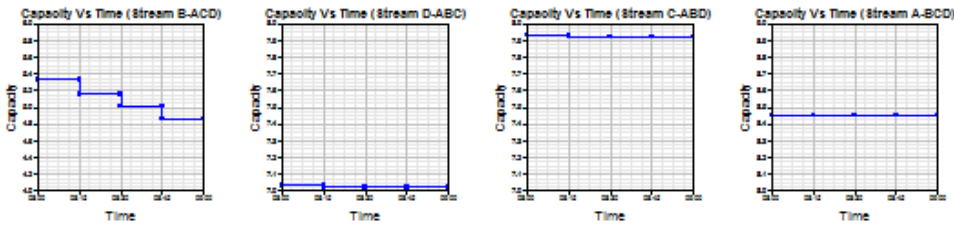
**Demand Set:** 2027 Baseline AM  
**Modelling Period:** 08:00-09:00



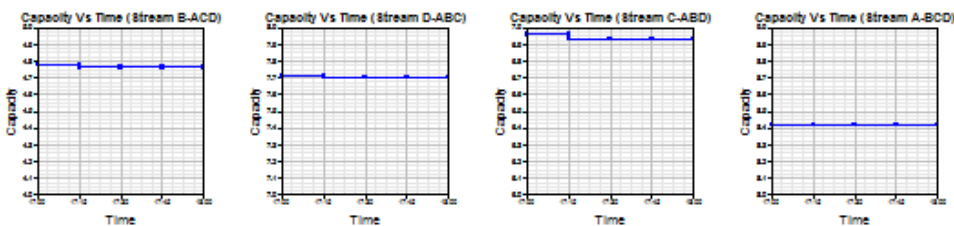
**Demand Set:** 2027 Baseline PM  
**Modelling Period:** 17:00-18:00



**Demand Set:** 2027 Baseline + Development AM  
**Modelling Period:** 08:00-09:00

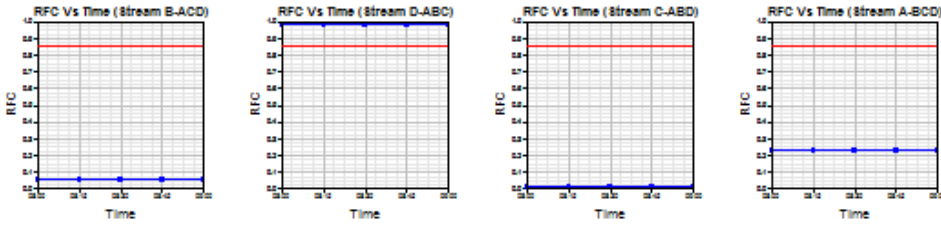


**Demand Set:** 2027 Baseline+ Development PM  
**Modelling Period:** 17:00-18:00

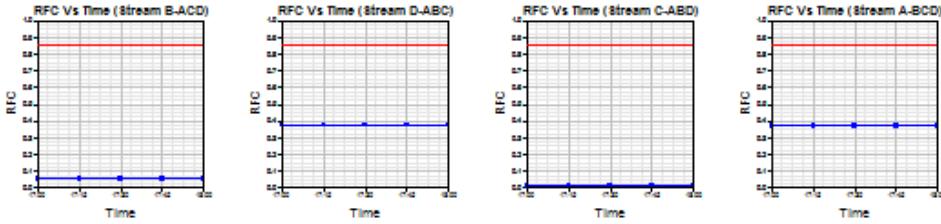


### RFC Graph

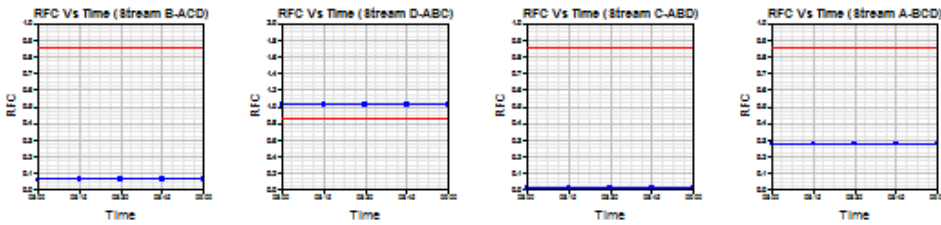
**Demand Set:** Observed 2017 AM  
**Modelling Period:** 08:00-09:00



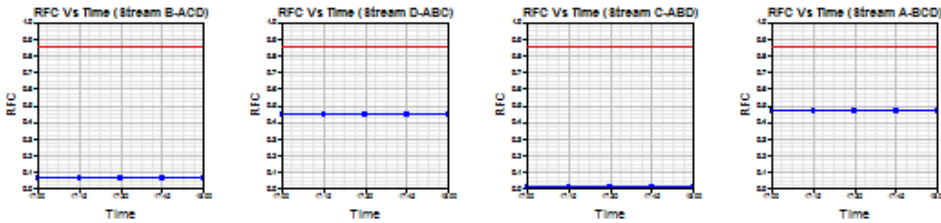
**Demand Set:** Observed 2017 PM  
**Modelling Period:** 17:00-18:00



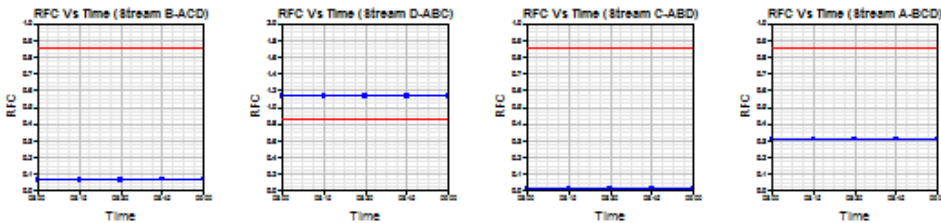
**Demand Set:** 2027 Baseline AM  
**Modelling Period:** 08:00-09:00



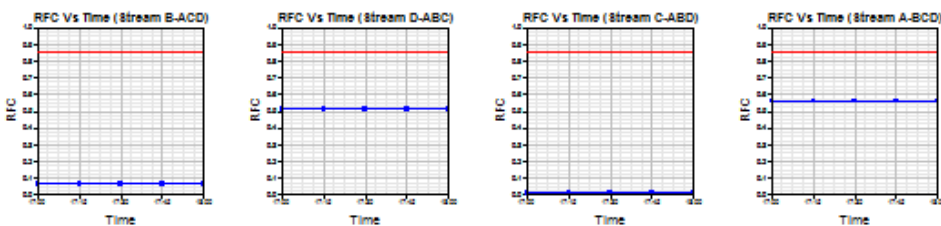
**Demand Set:** 2027 Baseline PM  
**Modelling Period:** 17:00-18:00



**Demand Set:** 2027 Baseline + Development AM  
**Modelling Period:** 08:00-09:00



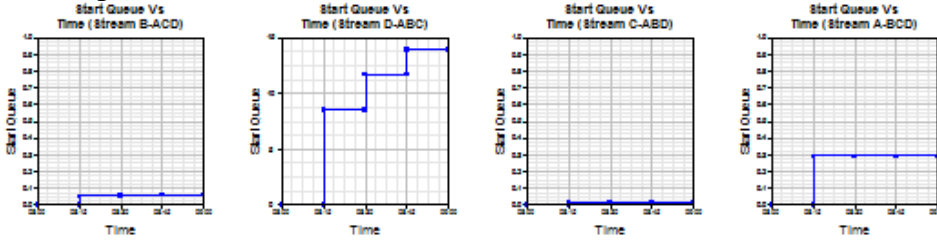
**Demand Set:** 2027 Baseline+ Development PM  
**Modelling Period:** 17:00-18:00



## Start Queue Graph

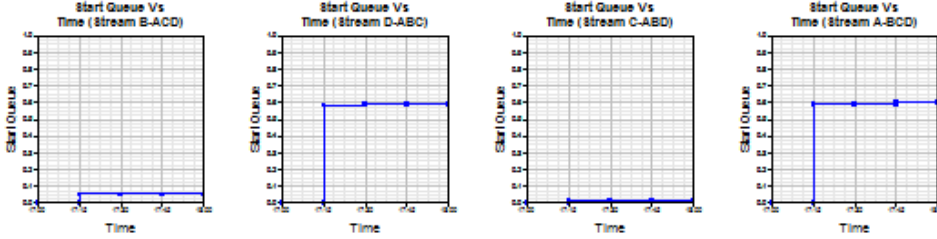
**Demand Set:** Observed 2017 AM

**Modelling Period:** 08:00-09:00



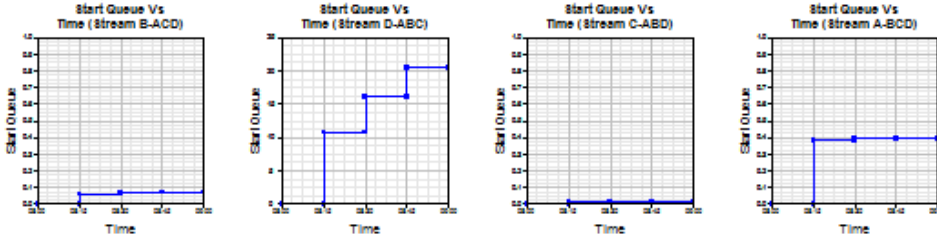
**Demand Set:** Observed 2017 PM

**Modelling Period:** 17:00-18:00



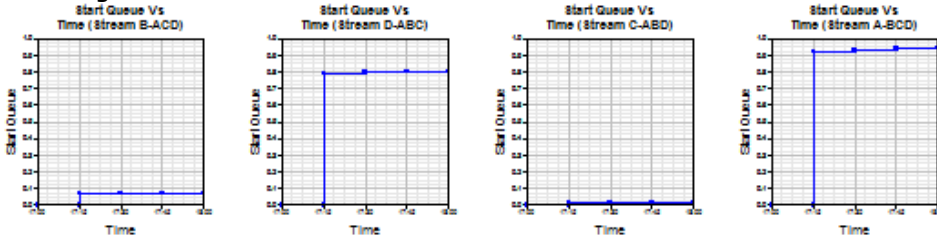
**Demand Set:** 2027 Baseline AM

**Modelling Period:** 08:00-09:00



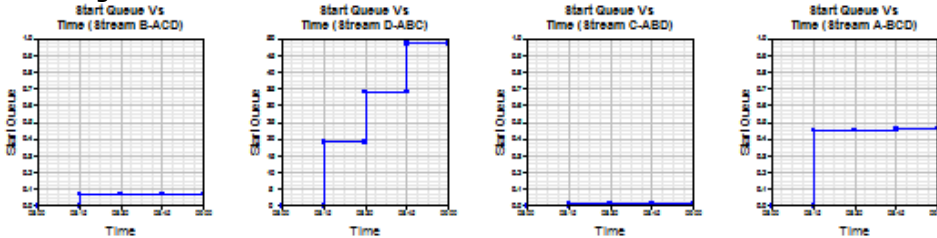
**Demand Set:** 2027 Baseline PM

**Modelling Period:** 17:00-18:00



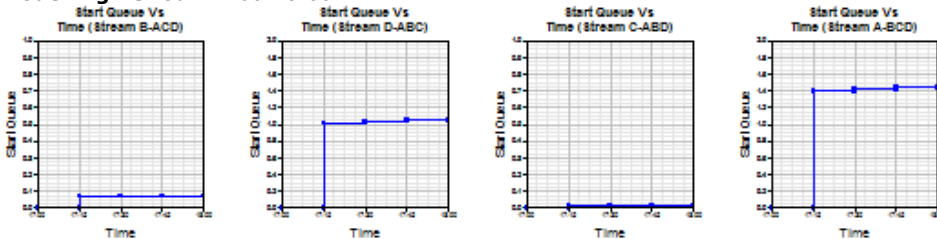
**Demand Set:** 2027 Baseline + Development AM

**Modelling Period:** 08:00-09:00



**Demand Set:** 2027 Baseline+ Development PM

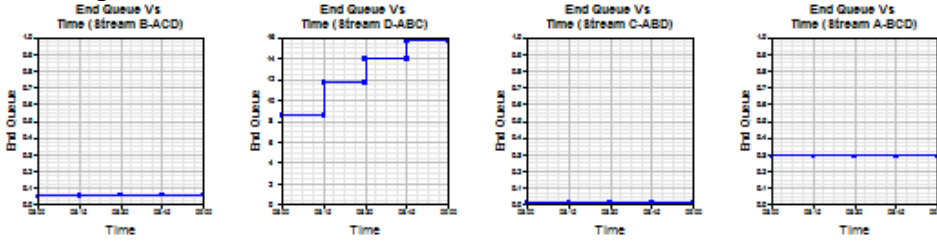
**Modelling Period:** 17:00-18:00



## End Queue Graph

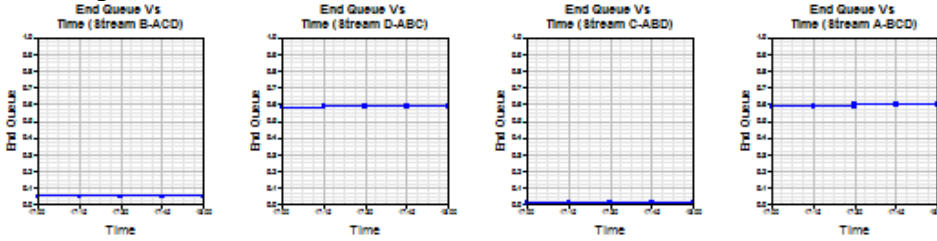
**Demand Set:** Observed 2017 AM

**Modelling Period:** 08:00-09:00



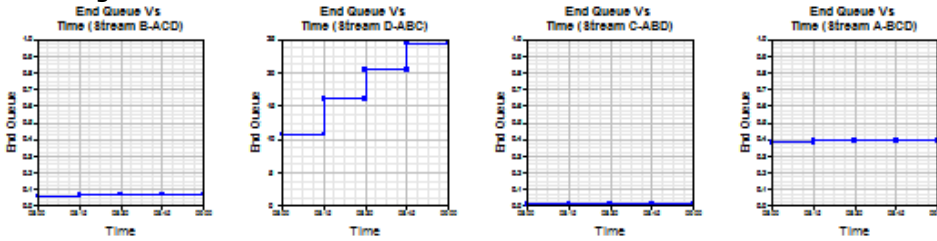
**Demand Set:** Observed 2017 PM

**Modelling Period:** 17:00-18:00



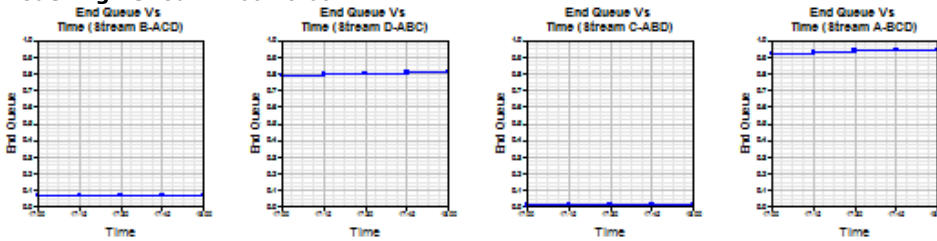
**Demand Set:** 2027 Baseline AM

**Modelling Period:** 08:00-09:00



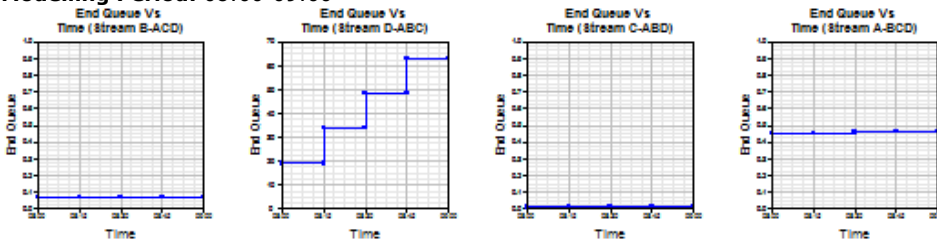
**Demand Set:** 2027 Baseline PM

**Modelling Period:** 17:00-18:00



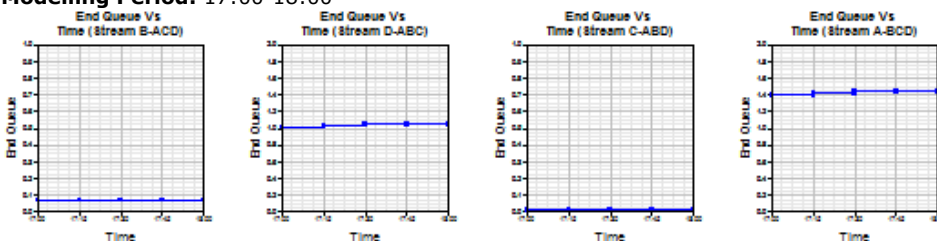
**Demand Set:** 2027 Baseline + Development AM

**Modelling Period:** 08:00-09:00



**Demand Set:** 2027 Baseline+ Development PM

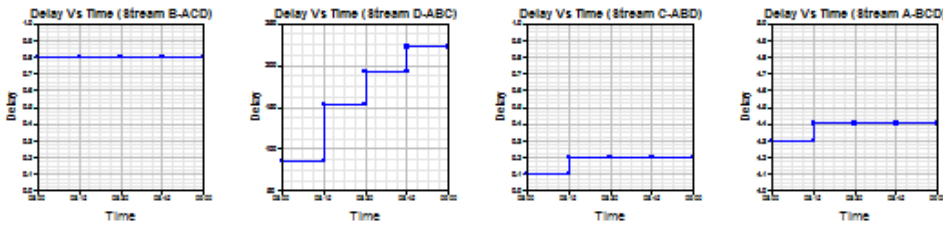
**Modelling Period:** 17:00-18:00



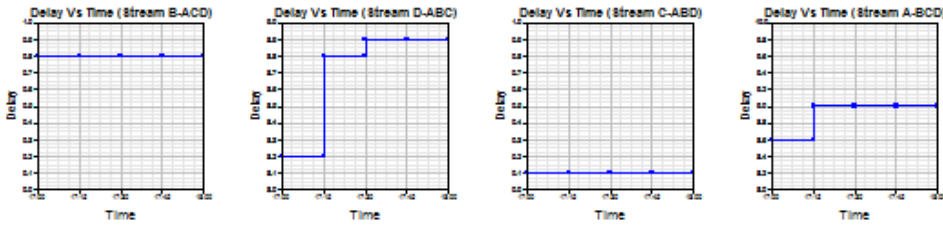


## Delay Graph

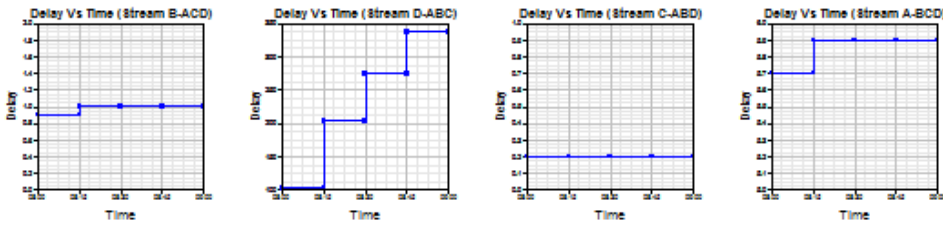
**Demand Set:** Observed 2017 AM  
**Modelling Period:** 08:00-09:00



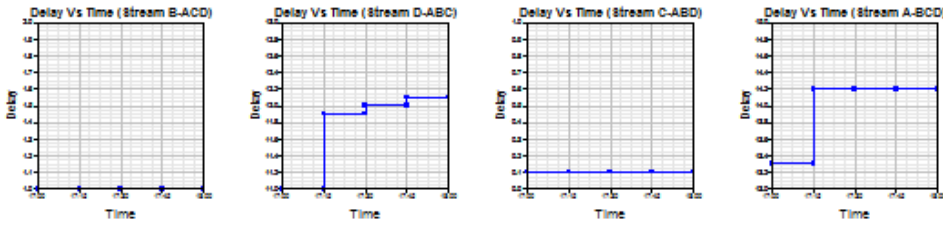
**Demand Set:** Observed 2017 PM  
**Modelling Period:** 17:00-18:00



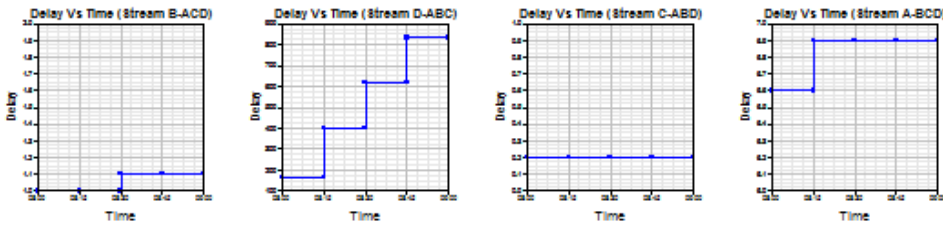
**Demand Set:** 2027 Baseline AM  
**Modelling Period:** 08:00-09:00



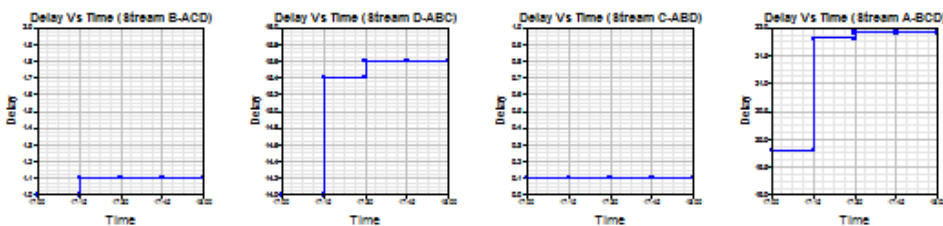
**Demand Set:** 2027 Baseline PM  
**Modelling Period:** 17:00-18:00



**Demand Set:** 2027 Baseline + Development AM  
**Modelling Period:** 08:00-09:00



**Demand Set:** 2027 Baseline+ Development PM  
**Modelling Period:** 17:00-18:00



## Queues & Delays

**Demand Set:** Observed 2017 AM

**Modelling Period:** 08:00-09:00

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
08:00-08:15	B-ACD	0.30	5.71	0.053	-	0.00	0.05	-	0.8	0.18
	D-ABC	6.78	6.94	<b>0.977</b>	-	0.00	8.52	-	85.7	1.03
	C-ABD	0.08	8.29	0.010	-	0.00	0.01	-	0.1	0.12
	C-A	-	-	-	-	-	-	-	-	-
	C-D	-	-	-	-	-	-	-	-	-
	A-BCD	1.93	8.60	0.225	-	0.00	0.29	-	4.3	0.15
	A-B	-	-	-	-	-	-	-	-	-
	A-C	-	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
08:15-08:30	B-ACD	0.30	5.64	0.053	-	0.05	0.06	-	0.8	0.19
	D-ABC	6.78	6.93	<b>0.978</b>	-	8.52	11.69	-	153.3	1.81
	C-ABD	0.08	8.28	0.010	-	0.01	0.01	-	0.2	0.12
	C-A	-	-	-	-	-	-	-	-	-
	C-D	-	-	-	-	-	-	-	-	-
	A-BCD	1.93	8.60	0.225	-	0.29	0.29	-	4.4	0.15
	A-B	-	-	-	-	-	-	-	-	-
	A-C	-	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
08:30-08:45	B-ACD	0.30	5.62	0.053	-	0.06	0.06	-	0.8	0.19
	D-ABC	6.78	6.93	<b>0.978</b>	-	11.69	13.92	-	192.9	2.17
	C-ABD	0.08	8.28	0.010	-	0.01	0.01	-	0.2	0.12
	C-A	-	-	-	-	-	-	-	-	-
	C-D	-	-	-	-	-	-	-	-	-
	A-BCD	1.93	8.60	0.225	-	0.29	0.29	-	4.4	0.15
	A-B	-	-	-	-	-	-	-	-	-
	A-C	-	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
08:45-09:00	B-ACD	0.30	5.60	0.054	-	0.06	0.06	-	0.8	0.19
	D-ABC	6.78	6.93	0.978	-	13.92	15.67	-	222.4	2.43
	C-ABD	0.08	8.28	0.010	-	0.01	0.01	-	0.2	0.12
	C-A	-	-	-	-	-	-	-	-	-
	C-D	-	-	-	-	-	-	-	-	-
	A-BCD	1.93	8.60	0.225	-	0.29	0.29	-	4.4	0.15
	A-B	-	-	-	-	-	-	-	-	-
	A-C	-	-	-	-	-	-	-	-	-

**Demand Set:** Observed 2017 PM

**Modelling Period:** 17:00-18:00

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
17:00-17:15	B-ACD	0.28	5.45	0.051	-	0.00	0.05	-	0.8	0.19
	D-ABC	2.93	7.84	0.374	-	0.00	0.58	-	8.2	0.20
	C-ABD	0.05	7.63	0.007	-	0.00	0.01	-	0.1	0.13
	C-A	-	-	-	-	-	-	-	-	-
	C-D	-	-	-	-	-	-	-	-	-
	A-BCD	3.15	8.58	0.367	-	0.00	0.59	-	8.6	0.18
	A-B	-	-	-	-	-	-	-	-	-
	A-C	-	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
17:15-17:30	B-ACD	0.28	5.44	0.051	-	0.05	0.05	-	0.8	0.19
	D-ABC	2.93	7.83	0.374	-	0.58	0.59	-	8.8	0.20
	C-ABD	0.05	7.62	0.007	-	0.01	0.01	-	0.1	0.13
	C-A	-	-	-	-	-	-	-	-	-
	C-D	-	-	-	-	-	-	-	-	-
	A-BCD	3.15	8.58	0.367	-	0.59	0.59	-	9.0	0.18
	A-B	-	-	-	-	-	-	-	-	-
	A-C	-	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
17:30-17:45	B-ACD	0.28	5.44	0.051	-	0.05	0.05	-	0.8	0.19
	D-ABC	2.93	7.83	0.374	-	0.59	0.59	-	8.9	0.20
	C-ABD	0.05	7.62	0.007	-	0.01	0.01	-	0.1	0.13
	C-A	-	-	-	-	-	-	-	-	-
	C-D	-	-	-	-	-	-	-	-	-
	A-BCD	3.15	8.58	0.367	-	0.59	0.60	-	9.0	0.18
	A-B	-	-	-	-	-	-	-	-	-
	A-C	-	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
17:45-18:00	B-ACD	0.28	5.44	0.051	-	0.05	0.05	-	0.8	0.19
	D-ABC	2.93	7.83	0.374	-	0.59	0.59	-	8.9	0.20
	C-ABD	0.05	7.62	0.007	-	0.01	0.01	-	0.1	0.13
	C-A	-	-	-	-	-	-	-	-	-
	C-D	-	-	-	-	-	-	-	-	-
	A-BCD	3.15	8.58	0.367	-	0.60	0.60	-	9.0	0.18
	A-B	-	-	-	-	-	-	-	-	-
	A-C	-	-	-	-	-	-	-	-	-

**Demand Set:** 2027 Baseline AM

**Modelling Period:** 08:00-09:00

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
08:00-08:15	B-ACD	0.34	5.54	0.061	-	0.00	0.06	-	0.9	0.19
	D-ABC	7.02	6.89	<b>1.018</b>	-	0.00	10.72	-	102.4	1.19
	C-ABD	0.10	8.02	0.012	-	0.00	0.01	-	0.2	0.13
	C-A	-	-	-	-	-	-	-	-	-
	C-D	-	-	-	-	-	-	-	-	-
	A-BCD	2.35	8.45	0.278	-	0.00	0.38	-	5.7	0.16
	A-B	-	-	-	-	-	-	-	-	-
	A-C	-	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
08:15-08:30	B-ACD	0.34	5.44	0.062	-	0.06	0.07	-	1.0	0.20
	D-ABC	7.02	6.89	<b>1.020</b>	-	10.72	16.07	-	202.7	2.32
	C-ABD	0.10	8.01	0.012	-	0.01	0.01	-	0.2	0.13
	C-A	-	-	-	-	-	-	-	-	-
	C-D	-	-	-	-	-	-	-	-	-
	A-BCD	2.35	8.45	0.278	-	0.38	0.39	-	5.9	0.16
	A-B	-	-	-	-	-	-	-	-	-
	A-C	-	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
08:30-08:45	B-ACD	0.34	5.39	0.063	-	0.07	0.07	-	1.0	0.20
	D-ABC	7.02	6.88	<b>1.020</b>	-	16.07	20.46	-	274.7	3.00
	C-ABD	0.10	8.01	0.012	-	0.01	0.01	-	0.2	0.13
	C-A	-	-	-	-	-	-	-	-	-
	C-D	-	-	-	-	-	-	-	-	-
	A-BCD	2.35	8.45	0.278	-	0.39	0.39	-	5.9	0.16
	A-B	-	-	-	-	-	-	-	-	-
	A-C	-	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
08:45-09:00	B-ACD	0.34	5.36	0.063	-	0.07	0.07	-	1.0	0.20
	D-ABC	7.02	6.88	<b>1.020</b>	-	20.46	24.37	-	336.6	3.57
	C-ABD	0.10	8.01	0.012	-	0.01	0.01	-	0.2	0.13
	C-A	-	-	-	-	-	-	-	-	-
	C-D	-	-	-	-	-	-	-	-	-
	A-BCD	2.35	8.45	0.278	-	0.39	0.39	-	5.9	0.16
	A-B	-	-	-	-	-	-	-	-	-
	A-C	-	-	-	-	-	-	-	-	-

Demand Set: 2027 Baseline PM

Modelling Period: 17:00-18:00

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
17:00-17:15	B-ACD	0.32	4.99	0.064	-	0.00	0.07	-	1.0	0.21
	D-ABC	3.44	7.68	0.448	-	0.00	0.79	-	11.0	0.23
	C-ABD	0.05	7.21	0.007	-	0.00	0.01	-	0.1	0.14
	C-A	-	-	-	-	-	-	-	-	-
	C-D	-	-	-	-	-	-	-	-	-
	A-BCD	3.93	8.42	0.467	-	0.00	0.92	-	13.3	0.22
	A-B	-	-	-	-	-	-	-	-	-
	A-C	-	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
17:15-17:30	B-ACD	0.32	4.97	0.064	-	0.07	0.07	-	1.0	0.21
	D-ABC	3.44	7.67	0.448	-	0.79	0.80	-	11.9	0.24
	C-ABD	0.05	7.19	0.007	-	0.01	0.01	-	0.1	0.14
	C-A	-	-	-	-	-	-	-	-	-
	C-D	-	-	-	-	-	-	-	-	-
	A-BCD	3.93	8.42	0.467	-	0.92	0.93	-	14.2	0.22
	A-B	-	-	-	-	-	-	-	-	-
	A-C	-	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
17:30-17:45	B-ACD	0.32	4.97	0.064	-	0.07	0.07	-	1.0	0.21
	D-ABC	3.44	7.67	0.448	-	0.80	0.80	-	12.0	0.24
	C-ABD	0.05	7.19	0.007	-	0.01	0.01	-	0.1	0.14
	C-A	-	-	-	-	-	-	-	-	-
	C-D	-	-	-	-	-	-	-	-	-
	A-BCD	3.93	8.42	0.467	-	0.93	0.94	-	14.2	0.22
	A-B	-	-	-	-	-	-	-	-	-
	A-C	-	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
17:45-18:00	B-ACD	0.32	4.97	0.064	-	0.07	0.07	-	1.0	0.21
	D-ABC	3.44	7.67	0.448	-	0.80	0.81	-	12.1	0.24
	C-ABD	0.05	7.19	0.007	-	0.01	0.01	-	0.1	0.14
	C-A	-	-	-	-	-	-	-	-	-
	C-D	-	-	-	-	-	-	-	-	-
	A-BCD	3.93	8.42	0.467	-	0.94	0.94	-	14.2	0.22
	A-B	-	-	-	-	-	-	-	-	-
	A-C	-	-	-	-	-	-	-	-	-

**Demand Set:** 2027 Baseline + Development AM

**Modelling Period:** 08:00-09:00

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
08:00-08:15	B-ACD	0.34	5.33	0.064	-	0.00	0.07	-	1.0	0.20
	D-ABC	7.96	7.03	<b>1.132</b>	-	0.00	19.14	-	163.8	1.74
	C-ABD	0.10	7.93	0.013	-	0.00	0.01	-	0.2	0.13
	C-A	-	-	-	-	-	-	-	-	-
	C-D	-	-	-	-	-	-	-	-	-
	A-BCD	2.62	8.45	0.310	-	0.00	0.45	-	6.6	0.17
	A-B	-	-	-	-	-	-	-	-	-
	A-C	-	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
08:15-08:30	B-ACD	0.34	5.15	0.066	-	0.07	0.07	-	1.0	0.21
	D-ABC	7.96	7.02	<b>1.133</b>	-	19.14	33.99	-	399.4	4.13
	C-ABD	0.10	7.92	0.013	-	0.01	0.01	-	0.2	0.13
	C-A	-	-	-	-	-	-	-	-	-
	C-D	-	-	-	-	-	-	-	-	-
	A-BCD	2.62	8.45	0.310	-	0.45	0.45	-	6.9	0.17
	A-B	-	-	-	-	-	-	-	-	-
	A-C	-	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
08:30-08:45	B-ACD	0.34	5.01	0.068	-	0.07	0.07	-	1.1	0.21
	D-ABC	7.96	7.02	1.134	-	33.99	48.44	-	618.5	6.16
	C-ABD	0.10	7.92	0.013	-	0.01	0.01	-	0.2	0.13
	C-A	-	-	-	-	-	-	-	-	-
	C-D	-	-	-	-	-	-	-	-	-
	A-BCD	2.62	8.45	0.310	-	0.45	0.46	-	6.9	0.17
	A-B	-	-	-	-	-	-	-	-	-
	A-C	-	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
08:45-09:00	B-ACD	0.34	4.86	0.070	-	0.07	0.07	-	1.1	0.22
	D-ABC	7.96	7.02	1.134	-	48.44	62.76	-	834.1	8.18
	C-ABD	0.10	7.92	0.013	-	0.01	0.01	-	0.2	0.13
	C-A	-	-	-	-	-	-	-	-	-
	C-D	-	-	-	-	-	-	-	-	-
	A-BCD	2.62	8.45	0.310	-	0.46	0.46	-	6.9	0.17
	A-B	-	-	-	-	-	-	-	-	-
	A-C	-	-	-	-	-	-	-	-	-

**Demand Set:** 2027 Baseline+ Development PM

**Modelling Period:** 17:00-18:00

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
17:00-17:15	B-ACD	0.32	4.78	0.067	-	0.00	0.07	-	1.0	0.22
	D-ABC	3.95	7.71	0.512	-	0.00	1.01	-	14.0	0.26
	C-ABD	0.05	6.96	0.007	-	0.00	0.01	-	0.1	0.14
	C-A	-	-	-	-	-	-	-	-	-
	C-D	-	-	-	-	-	-	-	-	-
	A-BCD	4.73	8.42	0.562	-	0.00	1.39	-	19.8	0.26
	A-B	-	-	-	-	-	-	-	-	-
	A-C	-	-	-	-	-	-	-	-	-



Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
17:15-17:30	B-ACD	0.32	4.76	0.067	-	0.07	0.07	-	1.1	0.23
	D-ABC	3.95	7.70	0.513	-	1.01	1.03	-	15.4	0.27
	C-ABD	0.05	6.93	0.007	-	0.01	0.01	-	0.1	0.15
	C-A	-	-	-	-	-	-	-	-	-
	C-D	-	-	-	-	-	-	-	-	-
	A-BCD	4.73	8.42	0.562	-	1.39	1.42	-	21.8	0.27
	A-B	-	-	-	-	-	-	-	-	-
	A-C	-	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
17:30-17:45	B-ACD	0.32	4.76	0.067	-	0.07	0.07	-	1.1	0.23
	D-ABC	3.95	7.70	0.513	-	1.03	1.04	-	15.6	0.27
	C-ABD	0.05	6.93	0.007	-	0.01	0.01	-	0.1	0.15
	C-A	-	-	-	-	-	-	-	-	-
	C-D	-	-	-	-	-	-	-	-	-
	A-BCD	4.73	8.42	0.562	-	1.42	1.44	-	21.9	0.27
	A-B	-	-	-	-	-	-	-	-	-
	A-C	-	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
17:45-18:00	B-ACD	0.32	4.76	0.067	-	0.07	0.07	-	1.1	0.23
	D-ABC	3.95	7.70	0.513	-	1.04	1.04	-	15.6	0.27
	C-ABD	0.05	6.93	0.007	-	0.01	0.01	-	0.1	0.15
	C-A	-	-	-	-	-	-	-	-	-
	C-D	-	-	-	-	-	-	-	-	-
	A-BCD	4.73	8.42	0.562	-	1.44	1.44	-	21.9	0.27
	A-B	-	-	-	-	-	-	-	-	-
	A-C	-	-	-	-	-	-	-	-	-

Entry capacities marked with an '(X)' are dominated by a pedestrian crossing in that time segment.

In time segments marked with a '(B)', traffic leaving the junction may block back from a crossing so impairing normal operation of the junction.

Delays marked with '###' could not be calculated.

## Overall Queues & Delays

### Queueing Delay Information Over Whole Period

**Demand Set:** Observed 2017 AM

**Modelling Period:** 08:00-09:00

Stream	Total Demand (veh)	Total Demand (veh/h)	Queueing Delay (min)	Queueing Delay (min/veh)	Inclusive Delay (min)	Inclusive Delay (min/veh)
B-ACD	18.0	18.0	3.3	0.2	3.3	0.2
D-ABC	406.8	406.8	654.2	1.6	671.9	1.7
C-ABD	5.0	5.0	0.6	0.1	0.6	0.1
C-A	-	-	-	-	-	-
C-D	-	-	-	-	-	-
A-BCD	116.0	116.0	17.4	0.1	17.4	0.1
A-B	1179.0	1179.0	675.5	0.6	693.2	0.6
A-C	-	-	-	-	-	-
<b>All</b>	-	-	-	-	-	-

**Demand Set:** Observed 2017 PM

**Modelling Period:** 17:00-18:00

Stream	Total Demand (veh)	Total Demand (veh/h)	Queueing Delay (min)	Queueing Delay (min/veh)	Inclusive Delay (min)	Inclusive Delay (min/veh)
B-ACD	16.8	16.8	3.2	0.2	3.2	0.2
D-ABC	175.8	175.8	34.9	0.2	34.9	0.2
C-ABD	3.0	3.0	0.4	0.1	0.4	0.1
C-A	-	-	-	-	-	-
C-D	-	-	-	-	-	-
A-BCD	189.0	189.0	35.6	0.2	35.6	0.2
A-B	1100.4	1100.4	74.0	0.1	74.1	0.1
A-C	-	-	-	-	-	-
<b>All</b>	-	-	-	-	-	-

**Demand Set:** 2027 Baseline AM

**Modelling Period:** 08:00-09:00

Stream	Total Demand (veh)	Total Demand (veh/h)	Queueing Delay (min)	Queueing Delay (min/veh)	Inclusive Delay (min)	Inclusive Delay (min/veh)
B-ACD	20.4	20.4	3.9	0.2	3.9	0.2
D-ABC	421.2	421.2	916.5	2.2	959.6	2.3
C-ABD	6.0	6.0	0.8	0.1	0.8	0.1
C-A	-	-	-	-	-	-
C-D	-	-	-	-	-	-
A-BCD	141.2	141.2	23.3	0.2	23.3	0.2
A-B	1299.6	1299.6	944.4	0.7	987.6	0.8
A-C	-	-	-	-	-	-
<b>All</b>	-	-	-	-	-	-

**Demand Set:** 2027 Baseline PM**Modelling Period:** 17:00-18:00

Stream	Total Demand (veh)	Total Demand (veh/h)	Queueing Delay (min)	Queueing Delay (min/veh)	Inclusive Delay (min)	Inclusive Delay (min/veh)
B-ACD	19.2	19.2	4.0	0.2	4.0	0.2
D-ABC	206.4	206.4	47.1	0.2	47.1	0.2
C-ABD	3.0	3.0	0.4	0.1	0.4	0.1
C-A	-	-	-	-	-	-
C-D	-	-	-	-	-	-
A-BCD	236.0	236.0	55.9	0.2	56.0	0.2
A-B	1274.4	1274.4	107.5	0.1	107.6	0.1
A-C	-	-	-	-	-	-
<b>All</b>	-	-	-	-	-	-

**Demand Set:** 2027 Baseline + Development AM**Modelling Period:** 08:00-09:00

Stream	Total Demand (veh)	Total Demand (veh/h)	Queueing Delay (min)	Queueing Delay (min/veh)	Inclusive Delay (min)	Inclusive Delay (min/veh)
B-ACD	20.4	20.4	4.2	0.2	4.2	0.2
D-ABC	477.6	477.6	2015.8	4.2	2296.3	4.8
C-ABD	6.0	6.0	0.8	0.1	0.8	0.1
C-A	-	-	-	-	-	-
C-D	-	-	-	-	-	-
A-BCD	157.3	157.3	27.2	0.2	27.2	0.2
A-B	1372.2	1372.2	2047.9	1.5	2328.4	1.7
A-C	-	-	-	-	-	-
<b>All</b>	-	-	-	-	-	-

**Demand Set:** 2027 Baseline+ Development PM**Modelling Period:** 17:00-18:00

Stream	Total Demand (veh)	Total Demand (veh/h)	Queueing Delay (min)	Queueing Delay (min/veh)	Inclusive Delay (min)	Inclusive Delay (min/veh)
B-ACD	19.2	19.2	4.2	0.2	4.2	0.2
D-ABC	237.0	237.0	60.6	0.3	60.7	0.3
C-ABD	3.0	3.0	0.4	0.1	0.4	0.1
C-A	-	-	-	-	-	-
C-D	-	-	-	-	-	-
A-BCD	283.8	283.8	85.4	0.3	85.5	0.3
A-B	1352.4	1352.4	150.6	0.1	150.8	0.1
A-C	-	-	-	-	-	-
<b>All</b>	-	-	-	-	-	-

Delay is that occurring only within the time period.

Inclusive delay includes delay suffered by vehicles which are still queuing after the end of the time period.

These will only be significantly different if there is a large queue remaining at the end of the time period.

**PICADY 5 Run Successful**

**acstro**

Priffyrdd a Thrafnidiaeth  
Highways & Transportation

# Appendix 14



EXISTING

PROPOSED

GILESTON ROAD

GILESTON ROAD

War

War

B4265

B4265

34.7m

34.7m

PROPOSED KERB RE-ALIGNMENT

B4265


B4265


GILESTON ROAD

GILESTON ROAD

GILESTON ROAD

GILESTON ROAD

A	First Issue	02-10-17
 Prifffrdd a Thrafnidiaeth Highways & Transportation Ty Penbryn, Salem, Llanddilo, SA19 7LT E-mail: mail@acstro.com www.acstro.com Tel: 01558 824021		
COWBRIDGE ROAD, ST ATHAN		
PROPOSED DEVELOPMENT		
0991	018	A
	1:200	@ A1

<b>PICADY</b>		
GUI Version: 5.1 AE Analysis Program Release: 5.0 (MAY 2010)		
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For sales and distribution information, program advice and maintenance, contact:		
TRL Limited Crowthorne House Nine Mile Ride Wokingham, Berks. RG40 3GA, UK		Tel: +44 (0)1344 770758 Fax: +44 (0)1344 770864 E-mail: <a href="mailto:software@trl.co.uk">software@trl.co.uk</a> Web: <a href="http://www.trlsoftware.co.uk">www.trlsoftware.co.uk</a>
<b>The user of this computer program for the solution of an engineering problem is in no way relieved of their responsibility for the correctness of the solution</b>		

## Run Analysis

Parameter	Values
File Run	Z:\..\Gileston Road\Gileston Rd Proposed.vpi
Date Run	06 October 2017
Time Run	10:28:06 AM
Driving Side	Drive On The Left

## Arm Names and Flow Scaling Factors

Arm	Arm Name	Flow Scaling Factor (%)
Arm A	B4265 (E)	100
Arm B	Gileston Rd (S)	100
Arm C	B4265 (W)	100
Arm D	Gileston Road (N)	100

## Stream Labelling Convention

Stream A-B contains traffic going from A to B etc.

## Run Information

Parameter	Values
Run Title	Gileston Rd / B4265
Location	-
Date	06 June 2017
Enumerator	Administrator [ALUNREES41AF]
Job Number	-
Status	-
Client	-
Description	-

## Errors and Warnings

Parameter	Values
Warning	No Errors Or Warnings

## Geometric Data

### Geometric Parameters

Parameter	Minor Arm B	Minor Arm D
Major Road Carriageway Width (m)	9.00	9.00
Major Road Kerbed Central Reserve Width (m)	0.00	0.00
Major Road Right Turning Lane Width (m)	3.00	3.00
Minor Road First Lane Width (m)	2.50	-
Minor Road Width 0m Back from Junction (m)	-	7.30
Minor Road Width 5m Back from Junction (m)	-	4.70
Minor Road Width 10m Back from Junction (m)	-	4.20
Minor Road Width 15m Back from Junction (m)	-	3.90
Minor Road Width 20m Back from Junction (m)	-	3.54
Minor Road Derived Flare Length (PCU)	-	1.000
Minor Road Visibility To Right (m)	50	50
Minor Road Visibility To Left (m)	30	50
Major Road Right Turn Visibility (m)	50	50
Major Road Right Turn Blocks Traffic	Yes (if over 2 veh)	Yes (if over 3 veh)

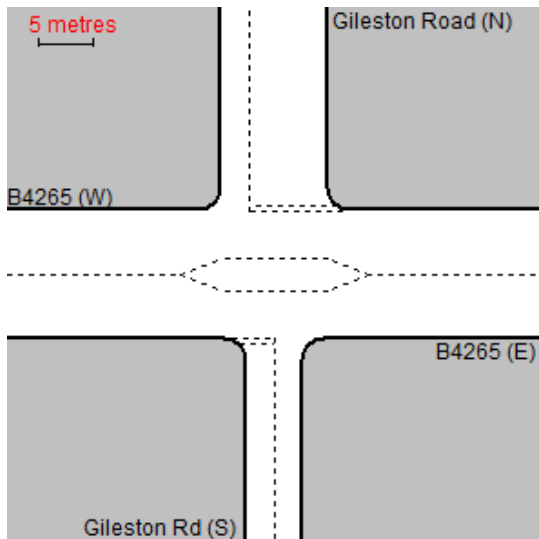
### Slope and Intercept Values

Stream	Intercept for Stream	Slope for A-B	Slope for A-C	Slope for A-D	Slope for B-A	Slope for B-C	Slope for B-D	Slope for C-A	Slope for C-B	Slope for C-D	Slope for D-A	Slope for D-B	Slope for D-C
C-B	655.413	0.221	0.221	0.315	-	-	-	-	-	-	-	-	-
A-D	655.413	-	-	-	-	-	-	0.221	0.315	0.221	-	-	-
B-A	486.263	0.077	0.195	0.195	-	-	-	0.122	0.278	-	0.195	0.195	0.097
B-C	622.604	0.083	0.210	-	-	-	-	-	-	-	-	-	-
B-D(L)	486.263	0.077	0.195	0.195	-	-	-	0.122	0.278	0.122	-	-	-
D-A	0.000	-	-	-	-	-	-	0.000	-	0.000	-	-	-
D-B(L)	0.000	0.000	0.000	0.000	-	-	-	0.000	0.000	0.000	-	-	-
D-C	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-	-	-
B-D(R)	486.263	0.077	0.195	0.195	-	-	-	0.122	0.278	0.122	-	-	-
D-B(R)	0.000	0.000	0.000	0.000	-	-	-	0.000	0.000	0.000	-	-	-

Note: Streams may be combined in which case capacity will be adjusted  
 These values do not allow for any site-specific corrections

Streams marked with '(L)' and '(R)' refer to the 'left' and 'right' lane of the minor arm that the originating traffic is on.

### Junction Diagram





## Demand Data

### Modelling Periods

Parameter	Period	Duration (min)	Segment Length (min)
First Modelling Period	08:00-09:00	60	15
Second Modelling Period	17:00-18:00	60	15

### Direct Entry Flows

**Demand Set:** 2027 Baseline + Development AM

**Modelling Period:** 08:00-09:00

**Segment:** 08:00-08:15

Arm	Flow (veh/min)
Arm A	7.93
Arm B	0.34
Arm C	6.64
Arm D	7.96

**Segment:** 08:15-08:30

Arm	Flow (veh/min)
Arm A	7.93
Arm B	0.34
Arm C	6.64
Arm D	7.96

**Segment:** 08:30-08:45

Arm	Flow (veh/min)
Arm A	7.93
Arm B	0.34
Arm C	6.64
Arm D	7.96

**Segment:** 08:45-09:00

Arm	Flow (veh/min)
Arm A	7.93
Arm B	0.34
Arm C	6.64
Arm D	7.96

**Demand Set:** 2027 Baseline+ Development PM

**Modelling Period:** 17:00-18:00

**Segment:** 17:00-17:15

Arm	Flow (veh/min)
Arm A	11.44
Arm B	0.32
Arm C	6.83
Arm D	3.95

**Segment:** 17:15-17:30

Arm	Flow (veh/min)
Arm A	11.44
Arm B	0.32
Arm C	6.83
Arm D	3.95

**Segment:** 17:30-17:45

Arm	Flow (veh/min)
Arm A	11.44
Arm B	0.32
Arm C	6.83
Arm D	3.95

**Segment:** 17:45-18:00

Arm	Flow (veh/min)
Arm A	11.44
Arm B	0.32
Arm C	6.83
Arm D	3.95

## Turning Counts

**Demand Set:** 2027 Baseline + Development AM

**Modelling Period:** 08:00-09:00

From/To	Arm A	Arm B	Arm C	Arm D
Arm A	-	2	316	157
Arm B	9	-	10	1
Arm C	359	6	-	33
Arm D	280	3	194	-

**Demand Set:** 2027 Baseline+ Development PM

**Modelling Period:** 17:00-18:00

From/To	Arm A	Arm B	Arm C	Arm D
Arm A	-	6	397	284
Arm B	7	-	7	6
Arm C	374	3	-	32
Arm D	198	10	29	-

Turning proportions are calculated from turning count data

## Turning Proportions

**Demand Set:** 2027 Baseline + Development AM

**Modelling Period:** 08:00-09:00

From/To	Arm A	Arm B	Arm C	Arm D
Arm A	0.000	0.004	0.665	0.331
Arm B	0.450	0.000	0.500	0.050
Arm C	0.902	0.015	0.000	0.083
Arm D	0.587	0.006	0.407	0.000

**Demand Set:** 2027 Baseline+ Development PM

**Modelling Period:** 17:00-18:00

From/To	Arm A	Arm B	Arm C	Arm D
Arm A	0.000	0.009	0.578	0.413
Arm B	0.350	0.000	0.350	0.300
Arm C	0.914	0.007	0.000	0.078
Arm D	0.835	0.042	0.122	0.000

### Heavy Vehicles Percentages

**Demand Set:** 2027 Baseline + Development AM  
**Modelling Period:** 08:00-09:00

From/To	Arm A	Arm B	Arm C	Arm D
Arm A	-	10.0	10.0	10.0
Arm B	10.0	-	10.0	10.0
Arm C	10.0	10.0	-	10.0
Arm D	10.0	10.0	10.0	-

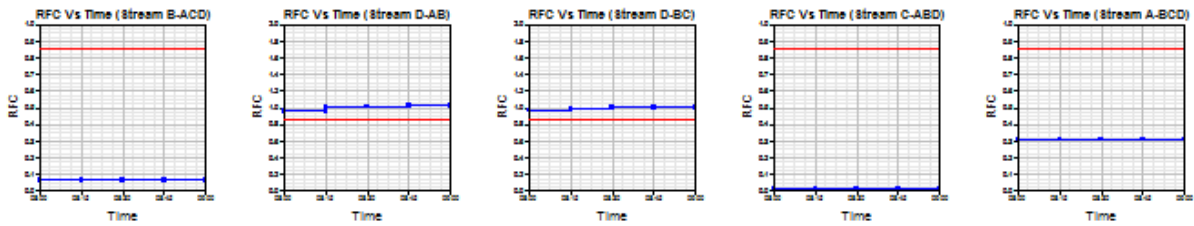
**Demand Set:** 2027 Baseline+ Development PM  
**Modelling Period:** 17:00-18:00

From/To	Arm A	Arm B	Arm C	Arm D
Arm A	-	10.0	10.0	10.0
Arm B	10.0	-	10.0	10.0
Arm C	10.0	10.0	-	10.0
Arm D	10.0	10.0	10.0	-

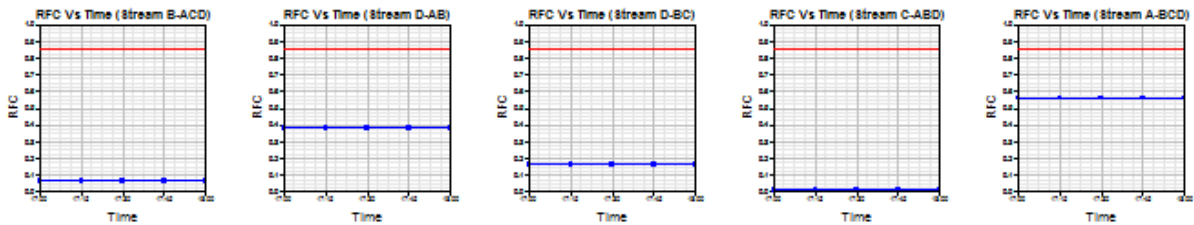
Default proportions of heavy vehicles are used

### RFC Graph

**Demand Set:** 2027 Baseline + Development AM  
**Modelling Period:** 08:00-09:00



**Demand Set:** 2027 Baseline+ Development PM  
**Modelling Period:** 17:00-18:00



## Queues & Delays

**Demand Set:** 2027 Baseline + Development AM

**Modelling Period:** 08:00-09:00

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
08:00-08:15	B-ACD	0.34	5.33	0.064	-	0.00	0.07	-	1.0	0.20
	D-AB	4.71	4.95	<b>0.952</b>	-	0.00	6.44	-	65.9	1.15
	D-BC	3.25	3.34	<b>0.971</b>	-	0.00	5.86	-	58.1	1.54
	C-ABD	0.10	7.93	0.013	-	0.00	0.01	-	0.2	0.13
	C-A	-	-	-	-	-	-	-	-	-
	C-D	-	-	-	-	-	-	-	-	-
	A-BCD	2.62	8.45	0.310	-	0.00	0.45	-	6.6	0.17
	A-B	-	-	-	-	-	-	-	-	-
A-C	-	-	-	-	-	-	-	-	-	

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
08:15-08:30	B-ACD	0.34	5.22	0.065	-	0.07	0.07	-	1.0	0.20
	D-AB	4.72	4.65	<b>1.014</b>	-	6.44	11.03	-	133.3	2.38
	D-BC	3.24	3.28	<b>0.988</b>	-	5.86	8.59	-	109.7	2.82
	C-ABD	0.10	7.92	0.013	-	0.01	0.01	-	0.2	0.13
	C-A	-	-	-	-	-	-	-	-	-
	C-D	-	-	-	-	-	-	-	-	-
	A-BCD	2.62	8.45	0.310	-	0.45	0.45	-	6.9	0.17
	A-B	-	-	-	-	-	-	-	-	-
A-C	-	-	-	-	-	-	-	-	-	

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
08:30-08:45	B-ACD	0.34	5.15	0.066	-	0.07	0.07	-	1.0	0.21
	D-AB	4.72	4.65	<b>1.015</b>	-	11.03	14.51	-	192.4	3.20
	D-BC	3.24	3.25	<b>0.998</b>	-	8.59	10.88	-	146.7	3.58
	C-ABD	0.10	7.92	0.013	-	0.01	0.01	-	0.2	0.13
	C-A	-	-	-	-	-	-	-	-	-
	C-D	-	-	-	-	-	-	-	-	-
	A-BCD	2.62	8.45	0.310	-	0.45	0.46	-	6.9	0.17
	A-B	-	-	-	-	-	-	-	-	-
A-C	-	-	-	-	-	-	-	-	-	

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
08:45-09:00	B-ACD	0.34	5.10	0.067	-	0.07	0.07	-	1.1	0.21
	D-AB	4.72	4.63	1.019	-	14.51	17.67	-	241.8	3.91
	D-BC	3.24	3.23	1.004	-	10.88	12.97	-	179.3	4.25
	C-ABD	0.10	7.92	0.013	-	0.01	0.01	-	0.2	0.13
	C-A	-	-	-	-	-	-	-	-	-
	C-D	-	-	-	-	-	-	-	-	-
	A-BCD	2.62	8.45	0.310	-	0.46	0.46	-	6.9	0.17
	A-B	-	-	-	-	-	-	-	-	-
A-C	-	-	-	-	-	-	-	-	-	

**Demand Set:** 2027 Baseline+ Development PM

**Modelling Period:** 17:00-18:00

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
17:00-17:15	B-ACD	0.32	4.78	0.067	-	0.00	0.07	-	1.0	0.22
	D-AB	3.39	8.93	0.380	-	0.00	0.60	-	8.5	0.18
	D-BC	0.56	3.48	0.160	-	0.00	0.19	-	2.6	0.34
	C-ABD	0.05	6.96	0.007	-	0.00	0.01	-	0.1	0.14
	C-A	-	-	-	-	-	-	-	-	-
	C-D	-	-	-	-	-	-	-	-	-
	A-BCD	4.73	8.42	0.562	-	0.00	1.39	-	19.8	0.26
	A-B	-	-	-	-	-	-	-	-	-
A-C	-	-	-	-	-	-	-	-	-	

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
17:15-17:30	B-ACD	0.32	4.76	0.067	-	0.07	0.07	-	1.1	0.23
	D-AB	3.39	8.91	0.381	-	0.60	0.61	-	9.1	0.18
	D-BC	0.56	3.45	0.161	-	0.19	0.19	-	2.8	0.35
	C-ABD	0.05	6.93	0.007	-	0.01	0.01	-	0.1	0.15
	C-A	-	-	-	-	-	-	-	-	-
	C-D	-	-	-	-	-	-	-	-	-
	A-BCD	4.73	8.42	0.562	-	1.39	1.42	-	21.8	0.27
	A-B	-	-	-	-	-	-	-	-	-
A-C	-	-	-	-	-	-	-	-	-	

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
17:30-17:45	B-ACD	0.32	4.76	0.067	-	0.07	0.07	-	1.1	0.23
	D-AB	3.39	8.91	0.381	-	0.61	0.61	-	9.2	0.18
	D-BC	0.56	3.45	0.161	-	0.19	0.19	-	2.8	0.35
	C-ABD	0.05	6.93	0.007	-	0.01	0.01	-	0.1	0.15
	C-A	-	-	-	-	-	-	-	-	-
	C-D	-	-	-	-	-	-	-	-	-
	A-BCD	4.73	8.42	0.562	-	1.42	1.44	-	21.9	0.27
	A-B	-	-	-	-	-	-	-	-	-
A-C	-	-	-	-	-	-	-	-	-	

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
17:45-18:00	B-ACD	0.32	4.76	0.067	-	0.07	0.07	-	1.1	0.23
	D-AB	3.39	8.91	0.381	-	0.61	0.61	-	9.2	0.18
	D-BC	0.56	3.45	0.161	-	0.19	0.19	-	2.9	0.35
	C-ABD	0.05	6.93	0.007	-	0.01	0.01	-	0.1	0.15
	C-A	-	-	-	-	-	-	-	-	-
	C-D	-	-	-	-	-	-	-	-	-
	A-BCD	4.73	8.42	0.562	-	1.44	1.44	-	21.9	0.27
	A-B	-	-	-	-	-	-	-	-	-
A-C	-	-	-	-	-	-	-	-	-	

Entry capacities marked with an '(X)' are dominated by a pedestrian crossing in that time segment.

In time segments marked with a '(B)', traffic leaving the junction may block back from a crossing so impairing normal operation of the junction.

Delays marked with '##' could not be calculated.

## Overall Queues & Delays

### Queueing Delay Information Over Whole Period

**Demand Set:** 2027 Baseline + Development AM

**Modelling Period:** 08:00-09:00

Stream	Total Demand (veh)	Total Demand (veh/h)	Queueing Delay (min)	Queueing Delay (min/veh)	Inclusive Delay (min)	Inclusive Delay (min/veh)
B-ACD	20.4	20.4	4.1	0.2	4.1	0.2
D-AB	283.0	283.0	633.4	2.2	667.1	2.4
D-BC	194.6	194.6	493.9	2.5	520.0	2.7
C-ABD	6.0	6.0	0.8	0.1	0.8	0.1
C-A	-	-	-	-	-	-
C-D	-	-	-	-	-	-
A-BCD	157.3	157.3	27.2	0.2	27.2	0.2
A-B	1372.2	1372.2	1159.3	0.8	1219.1	0.9
A-C	-	-	-	-	-	-
<b>All</b>	-	-	-	-	-	-

**Demand Set:** 2027 Baseline+ Development PM

**Modelling Period:** 17:00-18:00

Stream	Total Demand (veh)	Total Demand (veh/h)	Queueing Delay (min)	Queueing Delay (min/veh)	Inclusive Delay (min)	Inclusive Delay (min/veh)
B-ACD	19.2	19.2	4.2	0.2	4.2	0.2
D-AB	203.7	203.7	36.0	0.2	36.0	0.2
D-BC	33.3	33.3	11.1	0.3	11.1	0.3
C-ABD	3.0	3.0	0.4	0.1	0.4	0.1
C-A	-	-	-	-	-	-
C-D	-	-	-	-	-	-
A-BCD	283.8	283.8	85.4	0.3	85.5	0.3
A-B	1352.4	1352.4	137.1	0.1	137.2	0.1
A-C	-	-	-	-	-	-
<b>All</b>	-	-	-	-	-	-

Delay is that occurring only within the time period.

Inclusive delay includes delay suffered by vehicles which are still queuing after the end of the time period.

These will only be significantly different if there is a large queue remaining at the end of the time period.

### PICADY 5 Run Successful



**acstro**

Ymgynghorwyr Priffyrdd a Thrafnidiaeth  
Highways & Transportation Consultants

