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CWL-C DATA CENTRE, BRO TATHAN TRANSPORT ASSESSMENT

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CWL-C DATA CENTRE, BRO TATHAN
TRANSPORT ASSESSMENT

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1. INTRODUCTION

1.1 Background and Context

This Transport Assessment (TA) has been prepared by Ramboll on behalf of the F1 Enzo Properties ('the applicant') to support a full planning application for the proposed CWL-C Data Centre on a brownfield site off Northern Access Road in St. Athan, Wales.

The CWL-C Data Centre campus is a proposed data centre for F1 Enzo Properties intended for use in the EMEA (Europe, the Middle East and Africa) region. The CWL-C Data Centre building will house data processing equipment (telecommunications and computers) that will serve various businesses and enterprises that deliver on-line data services to the area. The majority of the building area will be comprised of data processing equipment halls and air conditioning equipment which support these halls and a small administration component (offices and maintenance) for support personnel for the facility. Space has also been allocated on-site for a substation and attenuation ponds for stormwater management.

1.2 Pre-Planning Application

On the 12th May 2022, Ramboll sent a pre-application Scoping checklist report to Nigel Rees, Vale of Glamorgan (VoG) Highways setting out Ramboll's proposed scope for undertaking the transport assessment for the proposed development. On 16th May 2022, Nigel Rees confirmed that a Transport Assessment (TA) would be required to support the planning application and that the assessment should assess the impact of the development on the local highway network for the 2022 baseline and proposed scenarios. It was confirmed the assessment should assess junctions from the B4265 roundabout with Northern Access Road (NAR), through the NAR to the St. Athan Road/Cowbridge Road and Gileston Road/B4265 junctions, taking account of the proposed committed developments along the Southern edge of the NAR. Nigel also confirmed that parking provisions should refer to the supplementary parking guidance (SPG) for VoG Council parking standards and that the development was classified as Use Class B8 'Storage or Distribution'.

Following the email from Nigel Rees, Ramboll responded on the 17th May 2022 seeking confirmation of which specific junctions that should be assessed and which committed developments should be included in the assessment. Amad Asadi from VoG Highways responded on the 13th June 2022 confirming that:

- The following four junctions should be assessed during the AM and PM peak hours for the 2022 baseline and proposed scenarios:
    - Junction 1: NAR/Aston Martin signal junction
    - Junction 2: NAR / St. Athan Road / Cowbridge Road roundabout
    - Junction 3: B4265 / Cowbridge Road / Gileston Road priority junction
    - Junction 4: B4265 / Northern Access Road (NAR) roundabout
- Two committed developments should be included in the assessment:
    - Committed Development 1: Beggar's Pound, Cowbridge Road (VoG planning application number: 2020/00434/OUT)
    - Committed Development 2: Residential Land at Llanmaes – Site B, Northern Access Road (VoG planning application number: 2020/00352/OUT)

This TA has therefore been prepared based on the following consultation with VoG Highways and details of the Scoping checklist report and correspondences with VoG Highways can be found in Appendix 1.

1.3 Report Purpose & Structure

This TA has been prepared to present all the material necessary to support a comprehensive assessment of the application proposals and is structured as follows:

- **Section 2: Policy Context** – summarises the relevant national and local planning policy context;
- **Section 3: Baseline Conditions** – presents the baseline transport conditions;
- **Section 4: Proposed Development** – presents the development proposals;
- **Section 5: Trip Generation** – presents the estimated trip generation for the proposed development;
- **Section 6: Operational Assessments** – presents the results of the operational assessments undertaken as part of this Transport Assessment;
- **Section 7: Swept Path Analysis** – provides details of the swept path analysis undertaken for all internal vehicle movements around the Site;
- **Section 8: Policy Compliance** – demonstrates compliance of development proposals with relevant national and local planning policy; and,
- **Section 9: Summary and Conclusion** – concludes the Transport Assessment.

2. POLICY REVIEW

2.1 Introduction

This section provides a summary of the relevant national and local transport planning policies applicable to the site.

2.1 National Policy

2.1.1 Planning Policy Wales

Planning Policy Wales (PPW) sets out the land use planning policies of the Welsh Government, with Edition 11 published February 2021. PPW sets out a strategic framework to guide development across the country.

The document promotes a transport hierarchy to give priority to active travel first, sustainable transport secondly, then by private motor vehicle.

PPW sets out that development proposals should prioritise sustainable travel movements over car travel, maximising accessibility by walking, cycling and public transport. The residual impact of any development to the local road network should be considered, with appropriate mitigation provided if required. This is achieved through the provision of a policy compliant Transport report, which will evidence the suitability of the development proposal and outline development impact at operation.

2.1.2 Future Wales – The National Plan 2040

Future Wales was adopted by the Welsh Government in February 2021 and sets out that developments should provide infrastructure that encourages sustainable travel, prioritising trips by walking, cycling and public transport.

2.1.3 Technical Advice Note 18: Transport

Technical Advice Note (TAN) 18: Transport, provides national advice on transport related issues when planning for new developments and was adopted by the Welsh Government in March 2007. The document includes integration between land use planning and transport, location, parking, and design of new developments.

The document promotes inclusive developments which cater for all travel users. It prioritises movements by sustainable modes, improving the attractiveness of urban areas by helping to avoid or manage congestion by encouraging movements by walking, cycling and public transport over car travel.

The document advises that Transport Assessments should provide the following information:

- The transport impacts of the development
- The impacts to assist the decision-making process
- Demonstrate the development is sited in a location that will produce a desired and predicted output (for example in terms of target modal split)
- Mitigate negative transport impacts through the design process and secured through planning conditions or obligations

- Maximise the accessibility of the development by non-car modes

2.1.4 Llwybr Newydd: The Wales Transport Strategy 2021

The Welsh Government's Llwybr Newydd: The Wales Transport Strategy sets out how the transport system in Wales will change over the next 20-year period and was adopted in March 2021. The document sets out the Welsh Government's priorities for Transport in Wales over the next five years, one of the priorities being to bring services to people to reduce the need for people to use their cars daily. To achieve this, new workplaces and homes will be built close to public transport interchanges and new developments will be designed to be walk and cycle friendly from the outset.

The Wales Transport Strategy proposes a modal shift change to achieve their aim of reducing carbon emissions from surface transport by half between 2020 and 2030, from 6 to 3 million tonnes CO2. The strategy has set a target that 45% of journeys will be made by public transport, walking, and cycling by 2040, an increase from the current mode share of 32%. This will be achieved through various infrastructure improvement schemes, data reviews and other measures to incentivise sustainable travel.

2.2 Local Policy

2.2.1 The Vale of Glamorgan Local Development Plan

The Vale of Glamorgan Local Development Plan (LDP) 2011–2026, was formally adopted in June 2017 and sets out the vision, objectives, strategy and polices for managing development, and contains several local planning policies, while making provision for the use of land for the purpose of housing, employment, retail, transport, and tourism. It also seeks to identify the infrastructure that will be required to meet the growth anticipated in the Vale of Glamorgan (VoG) up to 2026.

St. Athan is identified as one of three Strategic Opportunity Areas in the Wales Spatial Plan offering significant potential for regional benefits. The designation of the 'St. Athan – Cardiff Airport Enterprise Zone' in September 2011, focussed on the aerospace and defence sector and represents a significant opportunity to bring aerospace related inward investment to the area.

The LDP strategy acknowledges the important role St. Athan will play in the future prosperity of the Vale of Glamorgan and the wider South East Wales Capital Region. Policy SP7 seeks to maximise opportunities for new inward investment and growth arising from these designations, while Policy SP7(2) emphasises the strategic importance of a new Ffordd Bro Tathan to facilitate the future development of Bro Tathan at St. Athan as part of the Enterprise Zone, additionally, walking and cycling infrastructure will be incorporated within SP7(2) to link St. Athan with Llantwit Major (paragraph 5.71). Significant levels of new housing development are also proposed to reflect the importance of St. Athan to the Strategy of the Plan, and to support the key employment opportunities within the area.

2.2.2 Vale of Glamorgan Local Development Plan Supplementary Planning Guidance: Parking Standards

The Vale of Glamorgan Supplementary Planning Guidance (SPG): Parking Standards (adopted in March 2019), sets out the Council's parking standards for new development within the Vale of Glamorgan. Parking requirements are detailed according to land use and location and list requirements for commercial vehicles, cars, motorcycles and cycles.

The guidance also provides information in respect of how the preparation and adoption of travel plans and/or the location of the proposed development in relation to alternative sustainable modes of transport and local services/facilities may be taken into account in the level of parking provision required. The SPG also includes information on the Council's requirements in relation to the provision of infrastructure for Ultra Low Emission Vehicles (ULEVs).

The proposed site is classed as Use Class B8 by VoG and falls within the 'storage warehouse' land use classification. The site is located within Zone E (Deep Rural) of the VoG parking zone plan and Table 2.1 therefore presents the parking standards applicable to the site.

Table 2.1: Parking Standards – Use Class B8 (VoG Zones D-E)

Type of Space	Standard	Description
Car	1 space per 500 sqm	Maximum standard.
Car – Disabled Access	5% of the total car park capacity	Minimum standard to include both employees and visitors.
Car – ULEV Charging Points	10% of the total car park capacity	Minimum standard
Cycle	1 space per 500 sqm	Minimum standard. Long stay only.

The parking SPG sets out all the design, location and safety requirements for each type of parking.

The guidance states all disabled access spaces should be appropriately positioned, preferably within 50 metres of the facility served by the car park and should be of an adequate size and number in line with current national guidance.

For cycle parking, short stay and long stay parking are separately considered. Short stay parking addresses the needs of customers or other visitors to a development, whereas long stay parking is applicable to the needs of staff. Staff should also be encouraged to cycle to work by the provision of additional facilities such as lockers, changing areas and showers.

Covered cycle parking stands can also be an important element in encouraging the use of cycles and cycle parking should be located in a safe, secure and convenient location. Care should be taken to ensure that cycle parking facilities are not located where they may obstruct pedestrians, disabled persons and particularly people with sight problems. Appropriate signing should be provided to indicate the location of short-term cycle parking. For reasons of security, cycle parking facilities should be located in areas that are visible and therefore allow for informal surveillance. In certain instances, this could need to be supplemented through the introduction of CCTV or other security means.

2.2.3 The Vale of Glamorgan Local Transport Plan 2015-2030

The VoG Local Transport Plan 2015–2030 (LTP) recognises the need for a collaborative approach to help deliver enhanced mobility for both residents and visitors, with greater accessibility to jobs and services, thereby unlocking the potential for sustainable economic growth.

The LTP identifies that this can be done by:

- Providing new transport capacity to cope with future demand;
- Improving accessibility and connectivity, and reducing journey times between key settlements within South East Wales;
- Improving access to a wider range of job opportunities by increasing the coverage of public transport, particularly for cross-valley journeys;
- Expanding the effective labour market catchment for businesses, enabling local companies to recruit from a wider skills base;
- Supporting the growth of business clusters in the larger urban centres (for example, around the designated Enterprise Zones), helping to stimulate competition and innovation ensuring that additional travel demand does not impose costs on business through increased congestion and crowding; and
- Enhancing facilities that support our key airports, ports and freight terminals.

3. BASELINE CONDITIONS

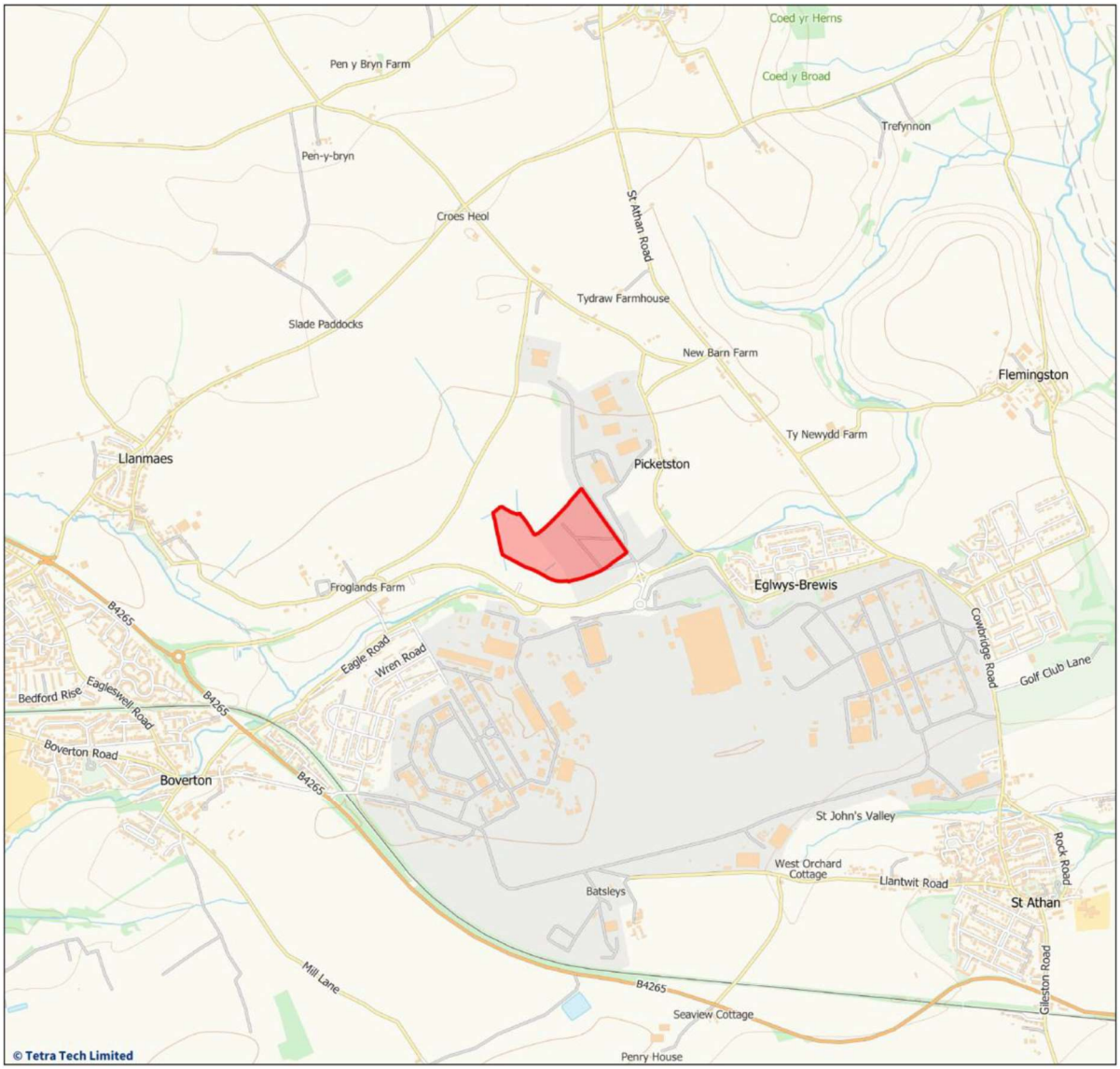
3.1 Site Location

The site is located on a vacant brownfield site within Bro Tathan North, which is the northern phase of the existing Bro Tathan business park, to the north-west of St. Athan and west of Eglwys-Brewis in the Vale of Glamorgan in South Wales.

The site sits immediately to the north of the Northern Access Road (NAR) and is bound to the south by the NAR, to the east and north by the wider Bro Tathan North area, and to the west by existing farmland.

The location of the site is shown at Figure 3.1.

Figure 3.1: Site Location Plans



3.2 Highway

3.2.1 Location Highway Network

The site is located on land to the north of Northern Access Road (NAR) and to the west of Lancaster Avenue.

The NAR is a two-way single carriageway road approximately 3.4km in length, linking the B4265 in the west with Bro Tathan and Eglwys-Brewis Road and village to the east. The main purpose of the NAR was to provide a good quality vehicular link between the B4265 and the significant developments planned in and around Bro Tathan, including the new Aston Martin facility and the northern phase of the Bro Tathan business park.

Lancaster Avenue which is situated to the east of the site has built to facilitate access to the Bro Tathan North business area which the site is situated within.

The B4265 is a strategic route in the south of the VoG, connecting Llantwit Major with the A4226 near Cardiff Airport. The A4226 continues to the Waycock Cross roundabout, on the western side of Barry.

To the west of the site, the B4265 forms a new roundabout with the NAR, providing access to Llanwit Major to the north and Boverton and St. Athan to the south. The staggered traffic signalled controlled junction with Llanmaes Road provides access south-west into Llantwit Major village and Llanmaes village via the north-eastern arm of the junction. To the west, the B4265 forms a roundabout with the residential development, Heol Pentre'r Cwrt and continues west on towards Wick and St. Brides Major.

To the east of the B4265/NAR junction, the B4265 forms a staggered traffic-signalled junction with Eglwys-Brewis Road and the road leading to Boverton/Llantwit Major. Around 400m east of these signals, the B4265 intersects with Llantwit Road at a priority junction. Llantwit Road eastbound provides access to the MOD Housing and the 'main gate' of the existing MOD facility.

Eglwys-Brewis Road runs in a north-easterly direction from the B4265, passing to the north of the MOD housing and Bro Tathan area. Although a two-way road it is narrow in places and includes a height restriction where it passes under the railway line, close to its junction with the B4265. Around 2km east of the B4265 there is a gated junction with the MOD area, and it is understood that aircraft/service vehicles occasionally need to cross the road at this point. To the east of this location the road forms a junction with the minor lane leading to Picketston, and then continues through Eglwys-Brewis village, before connecting with St. Athan Road.

To the east of the site, St. Athan Road continues south from the Eglwys-Brewis Road junction, and becomes Gileston Road as it passes through St. Athan village, forming a crossroads junction with the B4265 between St. Athan and Gileston. Further east the B4265 forms a roundabout junction with Tredogan Road, which provides access to facilities within Cardiff Airport. To the east of the roundabout the road becomes the A4226 which connects through to Cardiff Airport and the Waycock Cross roundabout on the western edge of Barry.

3.2.2 Existing Vehicular Access

The existing site is currently accessed from the east off the Lancaster Avenue via two access spurs on the eastern boundary of the site and to the south via an access spur off the NAR.

Lancaster Avenue is the northern arm of the Lancaster Avenue / NAR / Aston Martin four arm signal junction and provides the only access to Lancaster Avenue. The road provides access to the developing Bro Tathan North site as well as the existing South Wales Aviation Museum and other farm premises north of the site.

3.3 Sustainable Travel Conditions

3.3.1 Accessibility Guidance

3.3.1.1 Welsh Government Guidance

The Welsh Government Active Travel: Walking and Cycling in Wales document (2019) recorded for the VoG, approximately 11% of residents would use cycling as a regular mode of transport and approximately 43% walk daily or several times a week.

The Welsh Government Active Travel Act Guidance (2021) sets out that the vision of the Active Travel (Wales) Act is for walking and cycling to be the natural mode of choice for short everyday journeys, or as part of a longer journey in combination with other sustainable modes. The document sets out that many users are likely to walk up to 3.2km (2 miles), with some likely to walk up to 4.8km (3 miles), while many cyclists would cycle up to 8km (5 miles) with some willing to cycle up to 12km (7.5 miles).

The Welsh Government Personal Travel in Wales document (2013) recorded that a typical walking trip (for any purpose) was up to 1.6km and up to 14.5km for travel by bus. No data was assessed for cycling at the time of release. The study also recorded that on average, regular commuters travelling to work are prepared to walk for 12 minutes (960m), cycle for 21 minutes (5.6km) and travel 33 minutes by bus.

3.3.1.2 Best Practice Guidance

The Institution of Highways and Transport (IHT) guidance document 'Planning for Walking' (April 2015) states that 80% of journeys shorter than 1.6km are made wholly on foot with 20% for journeys that are 1.6km to 3.2km long also being undertaken on foot.

The Chartered Institution of Highways and Transport (IHT) guidance document 'Buses in Urban Developments' (January 2018) recommends a maximum walking distance to bus stops of 300 metres when accessing less frequent routes. The National Travel Survey (NTS) 2014 (September 2015), recorded that pedestrians will walk on average 624m to bus stops, when using a local bus as the main part of a local trip.

3.3.2 Access by Walking

Pedestrian access to the existing site is gained off Lancaster Avenue via a short pedestrian footway (approximately 35m in length) from the Lancaster Avenue / NAR / Aston Martin signal junction to the edge of the existing vehicular access to the south-east of the site.

Signalised pedestrian crossings are provided across all arms of the Lancaster Avenue / NAR / Aston Martin signal junction, facilitating pedestrian connectivity around the signal junction to the south-east corner of the existing site and onto the wider pedestrian network of the NAR and St. Athan.

From the Lancaster Avenue / NAR / Aston Martin signal junction, a 3.0m shared-use path is provided eastbound and westbound along the southern edge of the NAR, facilitating pedestrian travel between the site and existing residential areas, Eglwys-Brewis, bus stops along the NAR and travel to Llantwit Major and Llanmaes (to the west).

A GIS network analysis has been carried out to assess pedestrian accessibility from the development site. Figure 3.2 shows a 30-minute walk isochrone, which has been calculated based upon a walk speed of 4.8 km/hr.

Figure 3.2: Access by Walking (Within 30-minute walk of site)

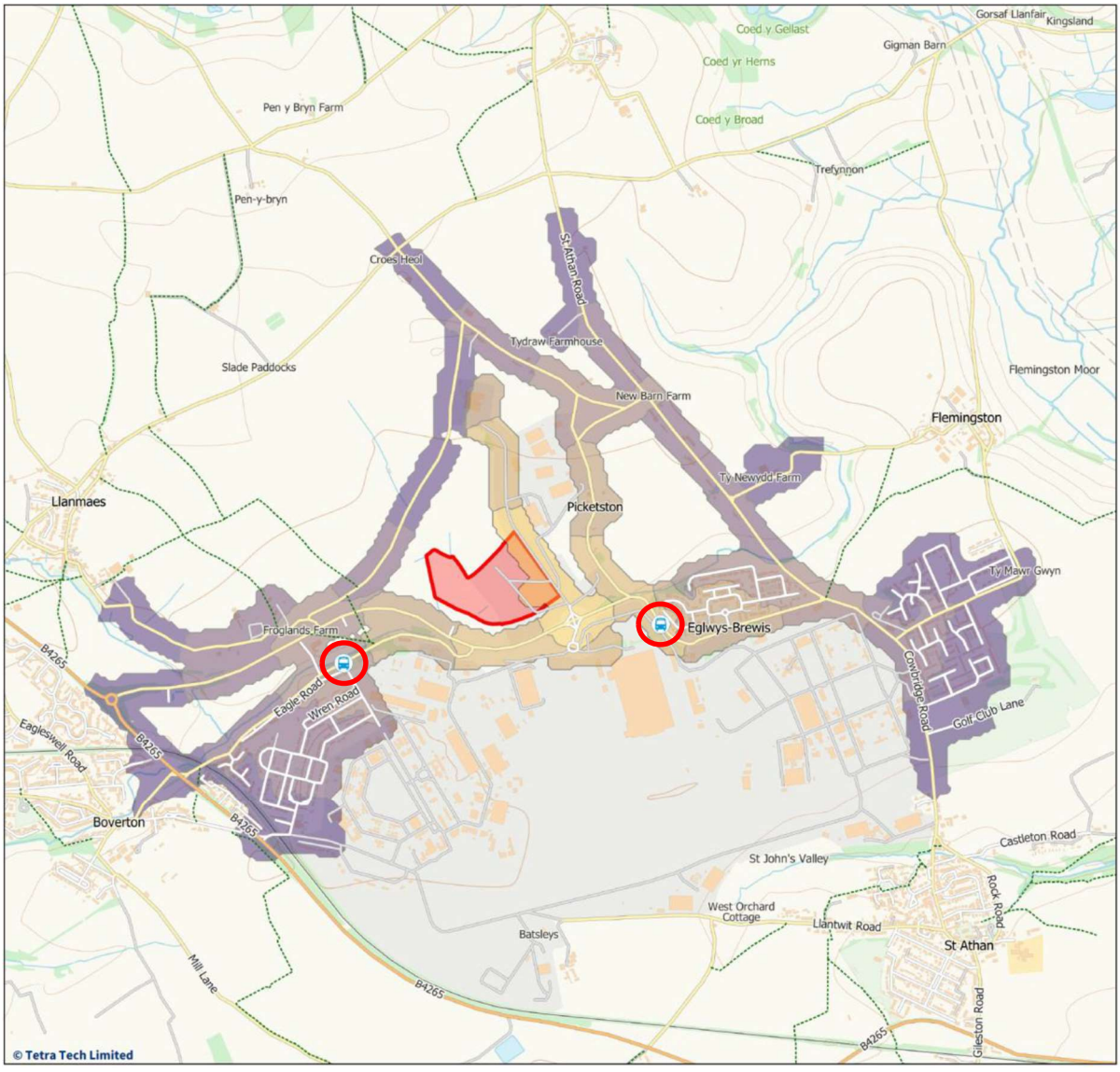


Figure 3.2 shows that the key bus stops (on the NAR and Eglwys-Brewis Road) are available within a 10-minute walk from the site, with existing residential areas to the east and west of the

site also accessible within a 30-minute walk. The assessment highlights that access to the site by foot or by a bus and walk multi-modal journey would be feasible for future site users.

3.3.3 Access by Cycling

Existing cycle access to the site is gained from the Lancaster Avenue. At the Lancaster Avenue / NAR / Aston Martin junction, signal crossings are provided across all arms, facilitating cyclist connections between the site, the NAR and the wider cycle network of St. Athan.

From the Lancaster Avenue / NAR / Aston Martin junction, a 3.0m shared-use path is provided along the southern boundary of the NAR, encouraging cycle travel from the site to St. Athan to the east, and Eglwys-Brewis, Llantwit Major to the west.

National Cycle Route 88 is situated approximately 2km north of the site and provides a signed cycle link on quiet country lanes, linking Rhoose, Llantwit Major and Wick to Cardiff, Barry, and Margam Country Park. National Cycle Route 88 links from National Cycle Route 88 in Llanmaes and provides a more direct signed on-road cycle route from Llanmaes to Margam Country Park.

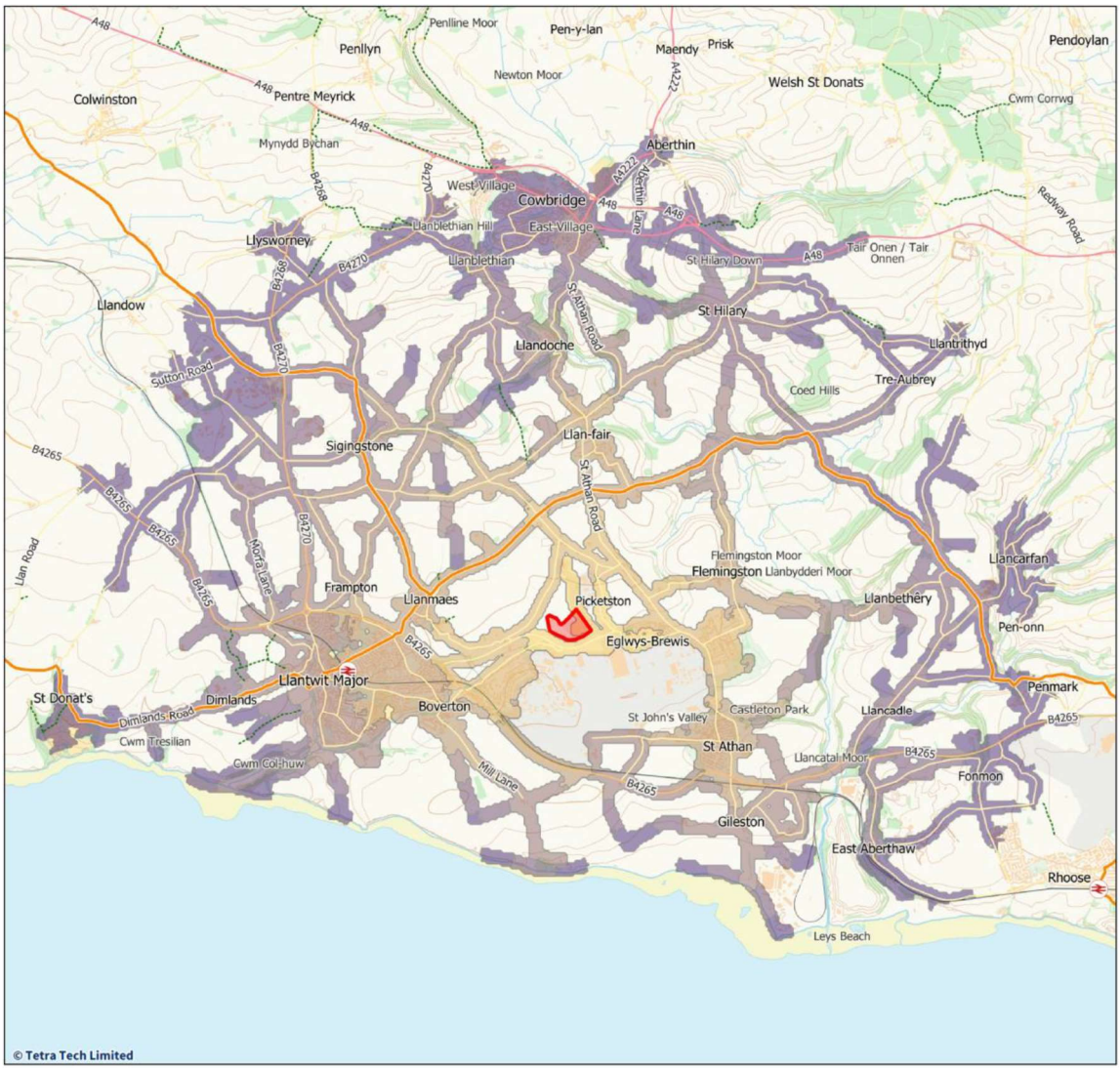
in 2021, the existing footway connection from East Camp to St. Athan was upgraded to a shared footway/cycleway, further enhancing the attractiveness of cycling to / from the site with St. Athan.

A GIS network analysis has been carried out to assess cyclist accessibility from the development site. Figure 3.3 shows a 30-minute cycling isochrone (8.0km) from the site, which has been calculated based upon a cycle speed of 16km/hr.

Figure 3.3 identifies several key settlements within cycling distance of the site, including Llantwit Major (west), Boverton (east), Cowbridge (north) and St. Athan (south-east). Llantwit Major Railway Station is within a 14-minute (3.8km) cycle ride to the west of the site. The proximity of the Railway Station offers opportunities for future site users to use cycling as part of their rail commute.

The location of the site offers opportunities to encourage cycle use amongst future site users, with the site located within cycling distance of several key settlements and transport interchanges.

Figure 3.3: Access by Cycling (Within 30-minute cycle of site))



3.3.4 Access by Bus

The nearest bus stops to site are located by Picketston Close approximately 500m east of the site along the NAR and on Eglwys-Brewis Road approximate 1km to the west of the site (as shown in Figure 3.2).

Bus stops are located either side of the carriageway and benefit from bus shelters with timetabling information, providing regular bus services to Eglwys-Brewis, St. Athan, Llantwit Major, Cardiff, Cardiff Airport and the wider surrounding area. The eastbound bus stops provide access to bus service 304 and the westbound bus stops provide access to the 304 and 905 bus services.

A summary of these bus services is presented in Table 3.1.

Table 3.1: Bus Service Summary

Service	Between	Mon-Fri	Sat	Sun
304	Llantwit Major – Cardiff City Centre	04:55, 05:55 then hourly 07:05-23:05	04:55, 05:55 then hourly 07:05-23:05	Every 2 hours 07:05-23:05
905	Rhoose Railway Station – Cardiff Airport	Hourly 06:16-23:16	No Service	No Service

Table 3.1 demonstrates there are opportunities for trips generated by the site to access Llantwit Major and Cardiff City Centre by bus. These are likely to be commuter trips to and from the site, with frequent services available throughout the day to Llantwit Major, Cardiff Airport, Rhoose, Barry, and Cardiff City Centre.

3.3.5 Access by Rail

Llantwit Major Railway Station is located approximately 3.8km to the southwest of the Site and can be accessed within a c.14-minute cycle or a 12-minute journey on the 304 bus. The station is located on the Vale of Glamorgan Line and is operated by Transport for Wales providing direct services to Cardiff and Pontypridd (via Cardiff Airport, Barry) to the east and to Bridgend to the west.

The station provides a self-service ticket machine, cycle parking is available in the form of 10-wheel racks and 40 car parking spaces.

Table 3.2 identifies the travel times to key destinations accessible from Llantwit Major Railway Station.

Table 3.2: Direct Rail Services from Llantwit Major

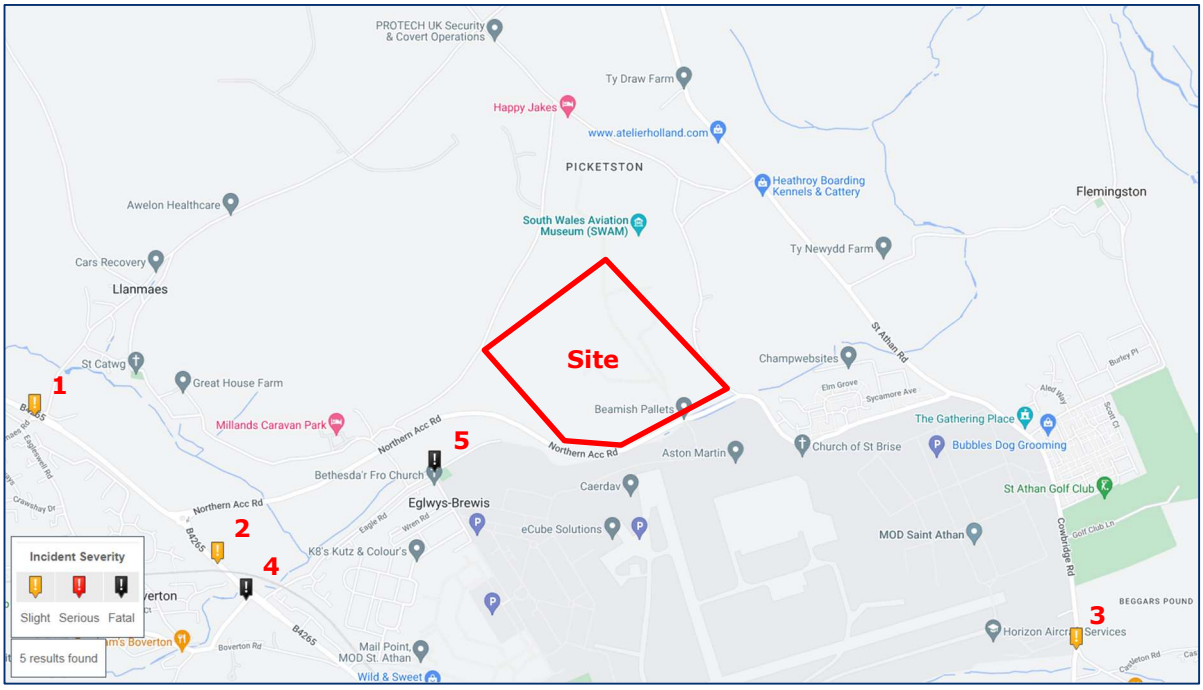
Destination	First Train	Last Train	Frequency	Duration
Bridgend	05:23	23:23	20 trains a day	0h15
Cardiff	04:56	22:57	19 trains a day	0h43
Pontypridd	05:56	21:56	13 trains a day	1h15

The site offers opportunities to connect to Llantwit Major Railway Station by cycling and by public transport. The station offers a reasonable provision of services to key destinations, offering future site users the option to use rail as part of their commutes.

3.4 Accident Analysis

To determine the safety of the existing highway in the vicinity of the proposed development, a review of the collision database 'Crashmap' has been undertaken for the latest 5-year period.

Figure 3.4: Crashmap Review – CWL-C Data Centre



Source: Crashmap

The Crashmap review, shown in Figure 3.4, highlights five incidents have occurred close to the proposed development over the last 5 years, of which three incidents were slight and two were fatal. Details of the incidents are as follows:

- **Incident One (Slight)** – occurred at the B4265/Llanmaes Road/Tyle House Close junction on 16/02/2019 and involved two vehicles and had one casualty,
- **Incident Two (Slight)** – occurred on the B4265 to the south of the B4265/Northern Access Road roundabout on 17/02/2017 and involved one vehicle and had one casualty,
- **Incident Three (Slight)** – occurred at the Cowbridge Road/Rock Road junction on 14/08/2019 and involved two vehicles and had one casualty,
- **Incident Four (Fatal)** – occurred at the B4265/Boverton Road junction on 28/07/2020 and involved one vehicle and had one casualty, and
- **Incident Five (Fatal)** – occurred on Eglwys-Brewis Road adjacent to Bethesda'r Fro Chapel on 16/11/2017 and involved one vehicle and had one casualty.

Review of these incidents highlights that no collisions occurred at the Site access, which would suggest it is appropriate in highways safety terms to accommodate the existing levels of vehicle activity. It should be noted, due to the impact on travel as a result of Covid-19 restrictions (i.e., working from home, limited travel etc), data in 2020 and 2021 may have been affected.

3.5 Baseline Traffic Data

In order to establish background traffic conditions on key junctions close to the site, the following four junctions were surveyed for 12 hours from 07:00 to 19:00 at:

- Junction 1: Lancaster Avenue / NAR / Aston Martin signal junction.
- Junction 2: NAR / St. Athan Road / Cowbridge Road roundabout.
- Junction 3: B4265 / Cowbridge Road / Gileston Road priority junction.

- Junction 4: B4265 / Northern Access Road (NAR) roundabout.

Junction 2 to 4 were surveyed on Tuesday 24th May 2022 and Junction 1 was surveyed on Thursday 9th June 2022. Analysing the surveys, the network peak hours were identified as:

- AM Peak: 08:00 to 09:00
- PM Peak: 16:00 to 17:00

Tables 3.3 to 3.10 present the 2022 surveyed turning movement flows at each of the four junctions for the AM and PM peak hours.

3.5.1 Junction 1: Lancaster Avenue / NAR / Aston Martin signal junction – Turning Movement Flows

Table 3.3: Junction 1: Lancaster Avenue / NAR / Aston Martin signal junction (AM Peak)

AM Peak	Access Rd	NAR (E)	Aston Martin	NAR (W)	Total
Access Rd	0	0	1	5	**6**
NAR (E)	4	0	27	152	**183**
Aston Martin	2	13	0	20	**35**
NAR (W)	5	96	31	0	**132**
Total	**12**	**109**	**59**	**177**	**356**

Table 3.4: Junction 1: Lancaster Avenue / NAR / Aston Martin signal junction (PM Peak)

PM Peak	Access Rd	NAR (E)	Aston Martin	NAR (W)	Total
Access Rd	0	5	0	7	**12**
NAR (E)	1	0	10	121	**132**
Aston Martin	5	82	0	93	**180**
NAR (W)	5	121	11	0	**137**
Total	**11**	**208**	**21**	**221**	**461**

3.5.2 Junction 2: NAR / St. Athan Road / Cowbridge Road roundabout – Turning Movement Flows

Table 3.5: Junction 2: NAR / St. Athan Road / Cowbridge Road roundabout (AM Peak)

AM Peak	St. Athan Rd (N)	Wilson Homes	Cowbridge Rd	NAR	Total
St. Athan Rd (N)	0	3	47	18	**68**
Wilson Homes	0	0	9	1	**10**
Cowbridge Rd	114	4	0	94	**212**
NAR	17	7	93	0	**117**
Total	**131**	**14**	**149**	**113**	**407**

Table 3.6: Junction 2: NAR / St. Athan Road / Cowbridge Road roundabout (PM Peak)

PM Peak	St. Athan Rd (N)	Wilson Homes	Cowbridge Rd	NAR	Total
St. Athan Rd (N)	0	3	46	6	**55**
Wilson Homes	4	0	6	1	**11**
Cowbridge Rd	66	6	0	81	**153**
NAR	10	1	60	0	**71**
Total	**80**	**10**	**112**	**88**	**290**

3.5.3 Junction 3 Turning Movement Flows

Table 3.7: Junction 3: B4265 / Cowbridge Road / Gileston Road priority junction (AM Peak)

AM Peak	Gileston Rd (N)	B4265 €	Gileston Rd (S)	B4265 (W)	Total
Gileston Rd (N)	0	191	5	59	**255**
B4265 (E)	127	0	5	290	**422**
Gileston Rd (S)	8	3	0	6	**17**
B4265 (W)	67	314	2	0	**383**
Total	**202**	**508**	**12**	**355**	**1077**

Table 3.8: Junction 3: B4265 / Cowbridge Road / Gileston Road priority junction (PM Peak)

PM Peak	Gileston Rd (N)	B4265 (E)	Gileston Rd (S)	B4265 (W)	Total
Gileston Rd (N)	0	179	6	56	**241**
B4265 (E)	202	0	3	287	**492**
Gileston Rd (S)	7	3	0	4	**14**
B4265 (W)	83	359	4	0	**446**
Total	**292**	**541**	**13**	**347**	**1193**

3.5.4 Junction 3: B4265 / Cowbridge Road / Gileston Road priority junction – Turning Movement Flows

Table 3.9: Junction 4: B4265 / Northern Access Road (NAR) roundabout (AM Peak)

AM Peak	B4265 (N)	NAR	B4265 (S)	Total
B4265 (N)	0	74	220	**294**
NAR	87	0	45	**132**
B4265 (S)	194	46	0	**240**
Total	**281**	**120**	**265**	**666**

Table 3.10: Junction 4: B4265 / Northern Access Road (NAR) roundabout (PM Peak)

PM Peak	B4265 (N)	NAR	B4265 (S)	Total
B4265 (N)	0	79	239	**318**
NAR	136	0	38	**174**
B4265 (S)	232	16	0	**248**
Total	**368**	**95**	**277**	**740**

4. PROPOSED DEVELOPMENT

4.1 Development Proposals

The CWL-C Data Centre is a proposed data centre for F1 Enzo Properties.

The proposed development comprises one data centre building and substations with associated plant, equipment, parking and manoeuvring space, landscaping and drainage works. The building is arranged over two floors and comprises of a total of twenty-four data halls.

In total 200 car parking spaces are to be provided alongside 10 cycle parking spaces. Vehicular access to the site will be via the northeast (construction and emergency) and southwest (main access).

Once 'live', the data centre will have 24/7 operation with security fencing around the entire perimeter of the site and secure, gated accesses at all vehicular and pedestrian/cyclist entrances. The site will be secured by a main entry gate to the south-west of the site, along with an emergency entry gate to the north-east corner of the site.

The site will have ad-hoc maintenance contractors and visitors and the data centre will be in operated on a shift basis with reduced numbers presented during night shifts.

4.2 Staff Numbers

The full data centre building will employ approximately 125 staff. These staff will be split into shifts to cover a 24/7 continuous working operation, from Monday through to Sunday.

The estimated arrival and departure movements for all staff are shown in the Trip Generation chapter in section 5.1.

4.3 Access

4.3.1 Vehicular Access

The main vehicular access to the site will be provided in the south-west corner of the site off the existing spur off the NAR located to the west of the NAR / Eglwys-Brewis Road junction. This spur will be extended to provide access to the main site entrance along with access to the substation. The main entrance will provide the primary vehicular access for all cars, light goods vehicles (LGV) and heavy goods vehicles (HGV) in and out of the site.

The substation is located to the north-west of the main site access and is situated within a secure fenced area outside of the main site secure line. The substation will have its own security gate access and will be accessed via the extended access spur road off the NAR.

Along with the main site access, there will also be a separate and secure emergency access provided to the north-east corner of the site off Lancaster Avenue. This access will be used as construction access during the construction phase of the site and then only for emergencies once the site is developed.

The main site access, emergency access and substation location are shown on the general arrangement plan in Appendix 2. All accesses will be secure entrances, with clearance required to enter or depart each security gate.

Once within the site, all areas of the site will accessible via an 8m wide, two-way internal access road that follows the perimeter of the data centre building. This internal access road provides internal access to all areas of the site including both entrances, loading docks and the main site car park, as shown on the general arrangement drawing (Appendix 2).

4.3.2 Pedestrian & Cycle Access

Pedestrian and cycle access into the site will be provided via the main site entrance to the south-west corner of the site, along with another pedestrian/cycle only entrance in the south-east corner of the site. Both pedestrian/cycle entrances will be secure, gated accesses that will require clearance/fob system to enter/depart.

Once within the site boundary, pedestrians can access all elevations of the data centre via pedestrian footways either side of the internal access road that circulate the data centre and main site car park. Marked crossings are provided across the internal access roads, to provide safe crossing points for pedestrians. Cyclists can access the cycle parking areas by using the internal site access road which will be a shared space for both vehicles and cycles due to the low volumes of traffic and speed. Footways, crossings and cycle friendly routes within the site are shown in the general arrangement plan in Appendix 2.

As part of the proposed development, a 3.0m wide shared-use pedestrian/cycle path will be provided along the access road from the NAR to the main site entrance. In addition, the 3.0m wide shared-use pedestrian/cycle path situated around the Lancaster Avenue / NAR / Aston Martin junction will be extended to the south-east pedestrian entrance. These two new links will provide high-quality pedestrian and cycle routes to/from the west and east of the site between the site, NAR and the surrounding pedestrian and cycle network (described in sections 3.3.2 and 3.3.3).

No pedestrian access is available at the emergency access or to the substation to the south of the site.

4.4 Parking

4.4.1 Car Parking

The CWL-C Data Centre will provide a total provision of 200 car parking spaces situated within the main site car park located within the south-west corner of the site inbetween the main site entrance and south-west elevation of the data centre. Of the 200 spaces, XXX spaces will be standard spaces, XX spaces will be standard spaces with EV charging facilities and XX spaces will be disabled access spaces of which XX of these spaces will have EV charging facilities. The locations of all spaces are shown on the general arrangement plan in Appendix 2 and are detailed in Table 4.1.

Table 4.1: Car Parking Provision

Parking Type	Total Car Spaces

Standard Spaces	XX
Standard EV Spaces	XX
Disabled Spaces	XX
Disabled EV Spaces	XX
Total Spaces	**200**

The main site car parking spaces will be accessed off the internal access road close to the main site access and all disabled spaces will be located close to the data centre pedestrian entrance to provide ease access for disabled users.

4.4.2 Cycle Parking

The CWL-C Data Centre will provide 10 cycle parking spaces in covered and secure cycle parking shelters, as shown in Table 4.2. The location of the spaces are shown on the general arrangement plan in Appendix 2.

Table 4.1: Cycle Parking Provision

Parking Type	Total Cycle Spaces
Cycle Spaces	10

4.4.3 HGV Parking

The proposed development will not provide any specific heavy goods vehicle (HGV) parking spaces but there will be two HGV unloading/loading bays on the northern and southern elevations of the data centre, whereby HGVs will be able enter site, unload/load and depart site via the internal access road and main site entrance.

4.5 Servicing & Deliveries

Deliveries will be directed to the truck dock located at each data centre building during initial deployment of equipment or periodic refresh of equipment. These deliveries may generate some rubbish (mostly packing materials), which will be compacted on site.

Deliveries after the initial deployment will occur sporadically throughout the day avoiding peak traffic hours on the local highway network.

The site layout is designed to support the delivery and replacement of equipment and primary plant, and to enable access for fire appliances in the event of fire.

5. TRIP GENERATION

This section of the report presents the estimated trips generated by the proposed development and the committed developments to be considered as part of the operational assessments.

5.1 Proposed Developments Trips

5.1.1 Vehicle Trips

The proposed development will generate two types of vehicle trips: staff car trips and site delivery trips (which will consist of the delivery and replacement of equipment and primary plant).

Table 5.1: Estimated Daily Trip Rate for Proposed Development

Time		Arrivals			Departures			Two-Way		
Start	Finish	Staff Trips	Delivery Trips	Total Trips	Staff Trips	Delivery Trips	Total Trips	Staff Trips	Delivery Trips	Total Trips
00:00	01:00	0	0	0	0	0	0	0	0	0
01:00	02:00	0	0	0	0	0	0	0	0	0
02:00	03:00	0	0	0	0	0	0	0	0	0
03:00	04:00	0	0	0	0	0	0	0	0	0
04:00	05:00	0	0	0	0	0	0	0	0	0
05:00	06:00	0	0	0	0	0	0	0	0	0
06:00	07:00	0.0303	0	0.0303	0.0303	0	0.0303	0.0606	0	0.606
07:00	08:00	0	0	0	0	0	0	0	0	0
08:00	**09:00**	**0.4545**	**0**	**0.4545**	**0.0758**	**0**	**0.0758**	**0.5303**	**0**	**0.5303**
09:00	10:00	0	0.0076	0.0076	0	0.0076	0.0076	0	0.0152	0.0152
10:00	11:00	0	0.0076	0.0076	0	0.0076	0.0076	0	0.0152	0.0152
11:00	12:00	0	0.0076	0.0076	0	0.0076	0.0076	0	0.0152	0.0152
12:00	13:00	0	0	0	0	0	0	0	0	0
13:00	14:00	0	0.0076	0.0076	0	0.0076	0.0076	0	0.0152	0.0152
14:00	15:00	0.0303	0.0076	0.0379	0.0303	0.0076	0.0379	0.0606	0.0152	0.758
15:00	16:00	0	0.0076	0.0076	0	0.0076	0.0076	0	0.0152	0.0152
16:00	17:00	0	0	0	0	0	0	0	0	0
17:00	**18:00**	**0.0758**	**0**	**0.0758**	**0.4545**	**0**	**0.4545**	**0.5303**	**0**	**0.5303**
18:00	19:00	0	0	0	0	0	0	0	0	0
19:00	20:00	0	0	0	0	0	0	0	0	0
20:00	21:00	0	0	0	0	0	0	0	0	0
21:00	22:00	0	0	0	0	0	0	0	0	0
22:00	23:00	0.0303	0	0.0303	0.0303	0	0.0303	0.0606	0	0.0606
23:00	00:00	0	0	0	0	0	0	0	0	0
Total		**135**	**0.6212**	**0.0455**	**0.6667**	**0.6212**	**0.0455**	**0.6667**	**1.2424**	**1.0909**

The estimated vehicular trips for the site have been calculated from first principles based on the vehicle trip rate per member of staff for a similar sized data centre. This vehicle trip rate is

considered to be representative of the vehicle trip rate for the proposed development. The trip rate profile for the proposed development across a typical day is presented in Table 5.1.

The average number of staff on site per day for all three data centre buildings will be 125 staff. Applying the trip rate for a similar sized data centre (Table 5.1) to the total number of proposed staff for the proposed development (125 staff) will generate the anticipated total trip generation for a typical day for the proposed development.

Staff trips are distributed according to their shift times. Deliveries will be scheduled throughout the day, trying to avoid the busier morning and evening peak periods. The estimated indicative arrival and departure trip profile across a typical midweek day for the data centre is shown in Table 5.2.

Table 5.2: Estimated Daily Trip Profile for Proposed Development

Time		Arrivals			Departures			Two-Way		
Start	**Finish**	**Staff Trips**	**Delivery Trips**	**Total Trips**	**Staff Trips**	**Delivery Trips**	**Total Trips**	**Staff Trips**	**Delivery Trips**	**Total Trips**
00:00	01:00	0	0	**0**	0	0	**0**	0	0	**0**
01:00	02:00	0	0	**0**	0	0	**0**	0	0	**0**
02:00	03:00	0	0	**0**	0	0	**0**	0	0	**0**
03:00	04:00	0	0	**0**	0	0	**0**	0	0	**0**
04:00	05:00	0	0	**0**	0	0	**0**	0	0	**0**
05:00	06:00	0	0	**0**	0	0	**0**	0	0	**0**
06:00	07:00	7	0	**7**	7	0	**7**	14	0	**14**
07:00	08:00	0	0	**0**	0	0	**0**	0	0	**0**
08:00	**09:00**	**98**	**0**	**98**	**16**	**0**	**16**	**114**	**0**	**114**
09:00	10:00	0	2	**2**	0	2	**2**	0	4	**4**
10:00	11:00	0	2	**2**	0	2	**2**	0	4	**4**
11:00	12:00	0	2	**2**	0	2	**2**	0	4	**4**
12:00	13:00	0	0	**0**	0	0	**0**	0	0	**0**
13:00	14:00	0	2	**2**	0	2	**2**	0	4	**4**
14:00	15:00	7	2	**9**	7	2	**9**	14	4	**18**
15:00	16:00	0	2	**2**	0	2	**2**	0	4	**4**
16:00	17:00	0	0	**0**	0	0	**0**	0	0	**0**
17:00	**18:00**	**16**	**0**	**16**	**98**	**0**	**98**	**114**	**0**	**114**
18:00	19:00	0	0	**0**	0	0	**0**	0	0	**0**
19:00	20:00	0	0	**0**	0	0	**0**	0	0	**0**
20:00	21:00	0	0	**0**	0	0	**0**	0	0	**0**
21:00	22:00	0	0	**0**	0	0	**0**	0	0	**0**
22:00	23:00	7	0	**7**	7	0	**7**	14	0	**14**
23:00	00:00	0	0	**0**	0	0	**0**	0	0	**0**
Total		**135**	**12**	**147**	**135**	**12**	**147**	**270**	**24**	**294**

As shown in Table 5.2, the proposed development will generate approximately 294 two-way trips throughout a typical day, of which 270 trips are staff vehicle trips and 24 are delivery trips.

Table 5.2 identifies that the proposed development AM peak hour is between 08:00 and 09:00 and the PM peak hour is between 17:00 and 18:00. Both peak hours will generate 114 two-way staff vehicle trips, with all delivery trips occurring outside the site and network peak hours. The network PM peak hour is from 16:00 to 17:00, compared to the proposed development PM peak hour (17:00-18:00). The proposed development PM peak (16:00-17:00) has been used in the assessment to provide a worst-case traffic assessment. Table 5.3 presents the estimated AM and PM peak hour vehicle trips for the proposed development.

Table 5.3: Proposed AM and PM peak hour vehicle trips

	Arrive			Depart			
	Staff Vehicle Trips	**Delivery Trips**	**Total Arriving Trips**	**Staff Vehicle Trips**	**Delivery Trips**	**Total Departing Trips**	**Total Trips**
AM Peak (08:00-09:00)	98	0	98	16	0	16	**114**
PM Peak (17:00-18:00)	16	0	16	98	0	98	**114**

5.1.2 Trip Distribution

The proposed development vehicle trips have been distributed onto the local highway network in the proportions recorded by the four surveyed junctions. Only the main strategic movements at each of the four junctions have been considered, with movements to small minor roads or developments excluded.

The resultant trip distribution of the proposed development trips across the local highway network at the four surveyed junctions for the AM and PM peak hours are presented in Figures 5.1 to 5.4.

Figure 5.1: Proposed Development Trip Distribution – Departures (AM Peak)

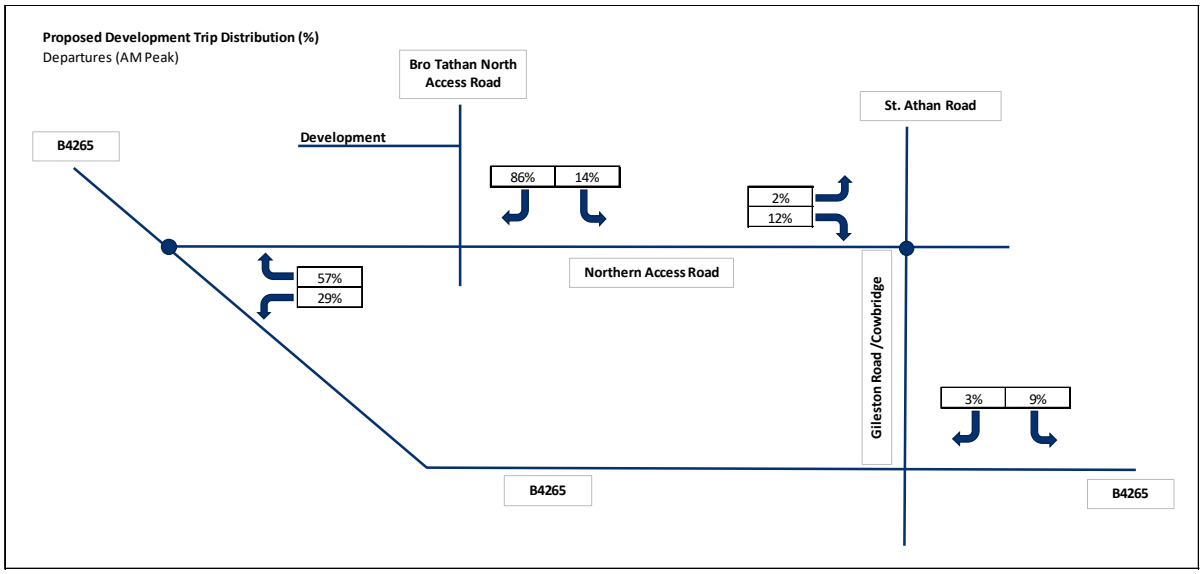


Figure 5.2: Proposed Development Trip Distribution – Arrivals (AM Peak)

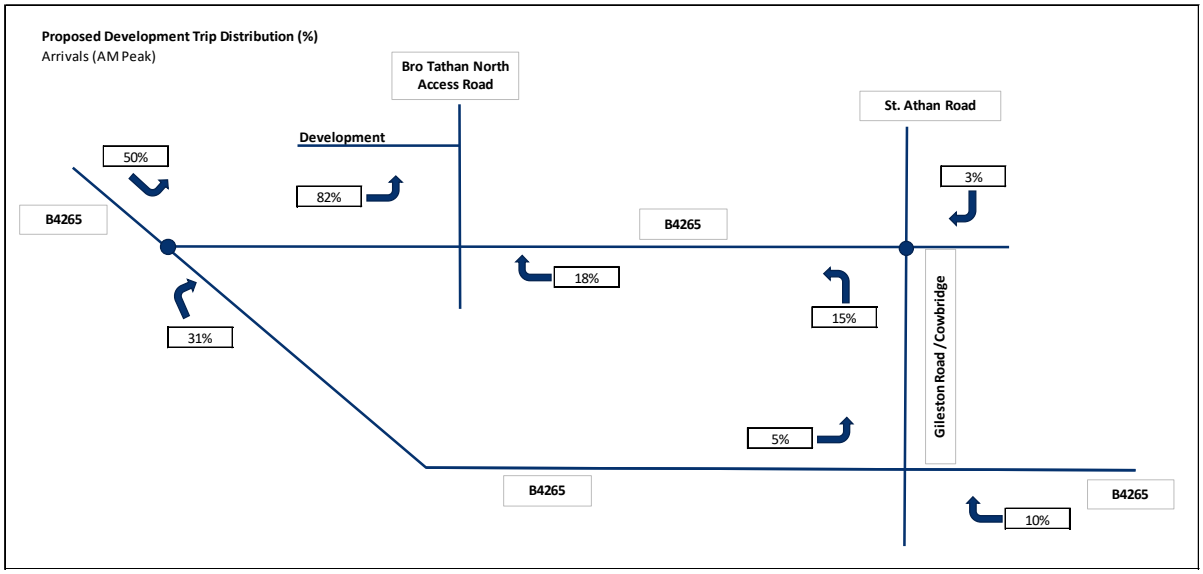


Figure 5.3: Proposed Development Trip Distribution – Departures (PM Peak)

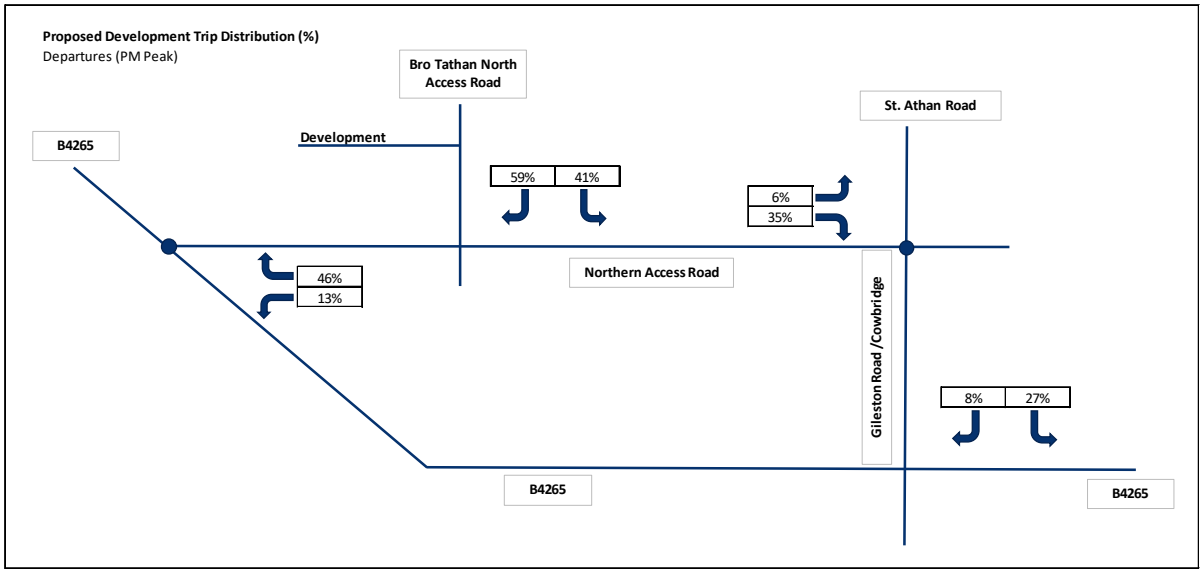
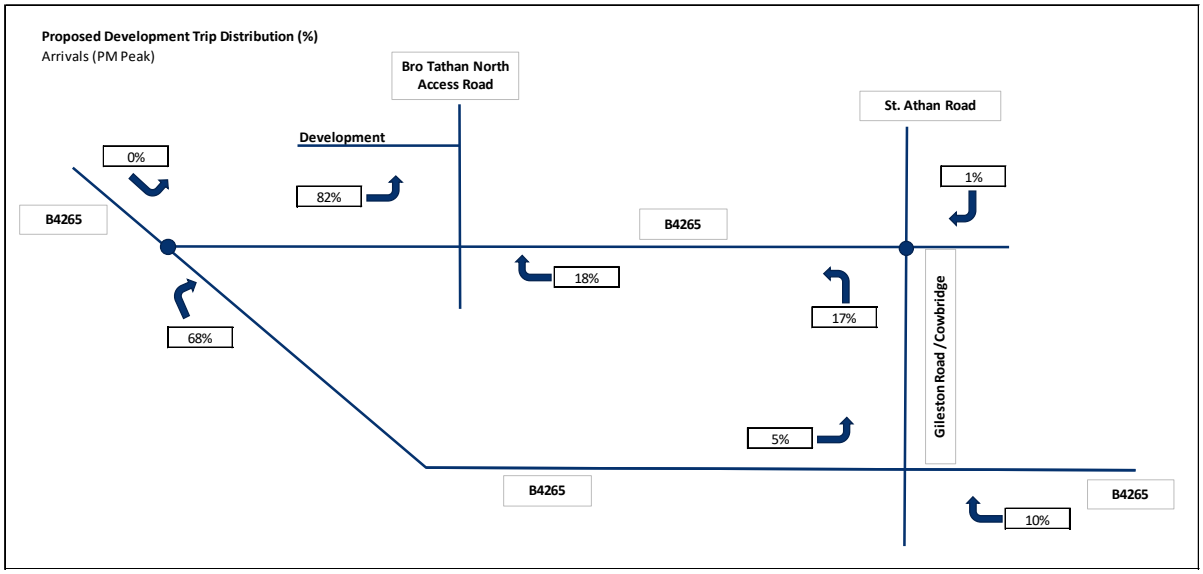


Figure 5.4: Proposed Development Trip Distribution – Arrivals (PM Peak)



5.1.3 Final Proposed Development Trips

The following tables present the proposed development trips distributed across the local highway network at the four surveyed junctions during the AM and PM peak hours.

5.1.3.1 Junction 1: Bro Tathan Access Road / NAR / Aston Martin signal junction

Table 5.4: Junction 1: Bro Tathan Access Road / NAR / Aston Martin signal junction (AM Peak)

AM Peak	Bro Tathan Access Rd	NAR (E)	Aston Martin	NAR (W)	Total
Bro Tathan Access Rd	0	2	0	14	**16**
NAR (E)	18	0	0	0	**18**
Aston Martin	0	0	0	0	**0**
NAR (W)	80	0	0	0	**80**
Total	**98**	**2**	**0**	**14**	**115**

Table 5.5: Junction 1: Bro Tathan Access Road / NAR / Aston Martin signal junction (PM Peak)

PM Peak	Bro Tathan Access Rd	NAR (E)	Aston Martin	NAR (W)	Total
Bro Tathan Access Rd	0	40	0	58	**98**
NAR (E)	3	0	0	0	**3**
Aston Martin	0	0	0	0	**0**
NAR (W)	13	0	0	0	**13**
Total	**16**	**40**	**0**	**58**	**115**

5.1.3.2 Junction 2: NAR / St. Athan Road / Cowbridge Road roundabout

Table 5.6: Junction 2: NAR / St. Athan Road / Cowbridge Road roundabout (AM Peak)

AM Peak	St. Athan Rd (N)	Wilson Homes	Cowbridge Rd	NAR	Total
St. Athan Rd (N)	0	0	0	8	**8**
Wilson Homes	0	0	0	0	**0**
Cowbridge Rd	0	0	0	41	**41**
NAR	1	0	7	0	**8**
Total	**1**	**0**	**7**	**49**	**57**

Table 5.7: Junction 2: NAR / St. Athan Road / Cowbridge Road roundabout (PM Peak)

PM Peak	St. Athan Rd (N)	Wilson Homes	Cowbridge Rd	NAR	Total
St. Athan Rd (N)	0	0	0	1	**1**
Wilson Homes	0	0	0	0	**0**
Cowbridge Rd	0	0	0	8	**8**
NAR	7	0	42	0	**49**
Total	**7**	**0**	**42**	**9**	**58**

5.1.3.3 Junction 3: B4265 / Cowbridge Road / Gileston Road priority junction

Table 5.8: Junction 3: B4265 / Cowbridge Road / Gileston Road priority junction (AM Peak)

AM Peak	Gileston Rd (N)	B4265 (E)	Gileston Rd (S)	B4265 (W)	Total
Gileston Rd (N)	0	5	0	2	**7**
B4265 (E)	27	0	0	0	**27**
Gileston Rd (S)	0	0	0	0	**0**
B4265 (W)	14	0	0	0	**14**
Total	**41**	**5**	**0**	**2**	**48**

Table 5.9: Junction 3: B4265 / Cowbridge Road / Gileston Road priority junction (PM Peak)

PM Peak	Gileston Rd (N)	B4265 (E)	Gileston Rd (S)	B4265 (W)	Total
Gileston Rd (N)	0	32	0	10	**42**
B4265 (E)	5	0	0	0	**5**
Gileston Rd (S)	0	0	0	0	**0**
B4265 (W)	2	0	0	0	**2**
Total	**8**	**32**	**0**	**10**	**50**

5.1.3.4 Junction 4: B4265 / Northern Access Road (NAR) roundabout

Table 5.10: Junction 4: B4265 / Northern Access Road (NAR) roundabout (AM Peak)

AM Peak	B4265 (N)	NAR	B4265 (S)	Total
B4265 (N)	0	30	0	**30**
NAR	5	0	3	**8**
B4265 (S)	0	19	0	**19**
Total	**5**	**49**	**3**	**57**

Table 5.11: Junction 4: B4265 / Northern Access Road (NAR) roundabout (PM Peak)

PM Peak	B4265 (N)	NAR	B4265 (S)	Total
B4265 (N)	0	7	0	**7**
NAR	38	0	11	**49**
B4265 (S)	0	1	0	**1**
Total	**38**	**8**	**11**	**57**

5.2 Multi-Model Trips

To estimate the multi-modal travel patterns of the proposed site, a multi-modal trip generation exercise has been undertaken using 2011 Census data for 'Method of Journey to Work' for the Llantwit Major and St. Athan ward, which are workplace zones W35001986 and W35001987 within 2011 Census data.

Table 5.12 presents the multi-modal trip generation that could reasonably be expected to be generated by proposed development.

Table 5.12: Multi-Modal Trip Generation

Method of Journey	Proportion	AM Peak (08:00-09:00)			PM Peak (16:00-18:00)		
		Arrival	Departure	Total	Arrival	Arrival	Total
Train	1%	2	0	**2**	0	0	**2**
Bus	1%	2	0	**2**	0	0	**2**
Other (Taxi)	3%	5	1	**6**	1	1	**6**
Motorcycle	1%	2	0	**2**	0	0	**2**
Car Driver	57%	**98**	**16**	**114**	**16**	**16**	**114**
Car Sharing / Passenger	4%	7	1	**8**	1	1	**8**
Cycling	7%	12	2	**14**	2	2	**14**
Walking	26%	45	7	**52**	7	7	**52**
Total	**100%**	**172**	**28**	**200**	**28**	**28**	**200**

As shown in Table 5.4, based on the multi-modal trip generation, the proposed development could generate in the order of 200 two-way person trips during a typical weekday AM and PM peak hour; of which 122 two-way trips will be car based trips, 64 two-way will be active travel trips (either walking or cycling) and the remaining 14 two-way trips will be public transport, taxi or motorcycle/scooter trips.

5.3 Committed Development Trips

As agreed with VoG Highways, two committed developments have been considered within this assessment and have been included within the 2022 baseline scenario. These developments are:

- Committed Development 1: Beggar's Pound off Cowbridge Road
- Committed Development 2: Residential Land at Llanmaes – Site B off Northern Access Road

5.3.1 Committed Development 1: Beggar's Pound – Trip Information

The first committed development to be considered as part of the 2022 Baseline scenario is the Beggar's Pound development, which is part of the Bro Tathan business park. The development proposals are for the erection of Class B1 office floorspace, a revised access onto Cowbridge Road, associated internal access routes, parking areas, fencing, landscaping, building and engineering operations.

The site is located to the south-east of the site, to the south of the NAR / St. Athan Road / Cowbridge Road roundabout. Traffic flows for this development have been extracted from the Beggar's Pound TA (VoG planning application numbers: 2020/00434/OUT) and have been distributed around the local highway network at the four surveyed junctions according to the flows presented in the TA.

Tables 5.13 to 5.16 present the Beggar's Pound development trips at junction 3 (Gileston Road Crossroads) and junction 4 (B4265/NAR roundabout) that have been considered within the 2022 Baseline scenario. The analysis concluded that no Beggar's Pound development trips would pass through junction 1 and 2, therefore these tables have not been included below.

Table 5.13: Beggar's Pound Development Trips @ Junction 3 (AM Peak)

AM Peak	Gileston Rd (N)	B4265 (E)	Gileston Rd (S)	B4265 (W)	Total
Gileston Rd (N)	0	7	0	8	**15**
B4265 (E)	28	0	0	0	**28**
Gileston Rd (S)	0	0	0	0	**0**
B4265 (W)	29	0	0	0	**29**
Total	**57**	**7**	**0**	**8**	**72**

Table 5.14: Beggar's Pound Development Trips @ Junction 3 (PM Peak)

PM Peak	Gileston Rd (N)	B4265 (E)	Gileston Rd (S)	B4265 (W)	Total
Gileston Rd (N)	0	24	0	25	**49**
B4265 (E)	11	0	0	0	**11**
Gileston Rd (S)	0	0	0	0	**0**
B4265 (W)	12	0	0	0	**12**
Total	**23**	**24**	**0**	**25**	**72**

Table 5.15: Beggar's Pound Development Trips @ Junction 4 (AM Peak)

AM Peak	B4265 (N)	NAR	B4265 (S)	Total
B4265 (N)	0	0	27	**27**
NAR	0	0	0	**0**
B4265 (S)	7	0	0	**7**
Total	**7**	**0**	**27**	**34**

Table 5.16: Beggar's Pound Development Trips @ Junction 4 (PM Peak)

PM Peak	B4265 (N)	NAR	B4265 (S)	Total
B4265 (N)	0	0	12	**12**
NAR	0	0	0	**0**
B4265 (S)	24	0	0	**24**
Total	**24**	**0**	**12**	**36**

5.3.2 Committed Development 2: Residential Land at Llanmaes – Site B, Northern Access Road – Trip Information

The second committed development to be considered as part of the 2022 Baseline scenario is the residential housing development (Site B) at Llanmaes. The development proposals are for the construction of 90 homes on land adjacent to Froglands Farm to the north-west of St. Athan.

The site is located approximately 2km to the west of the site on the south-east corner of the B4265 / NAR roundabout. Traffic flows for this development have been extracted from the accompanying TA for the development (VoG planning application numbers: 2020/00352/OUT) and these trips have been distributed on the local highway network at the four surveyed junctions according to the flows presented in the TA.

Tables 5.17 to 5.24 present the development trips for this site at the four surveyed junctions that have been considered within the 2022 Baseline scenario assessment.

Table 5.17: Resident Land @ Llanmaes Development Trips @ Junction 1 (AM Peak)

AM Peak	Bro Tathan Access Rd	NAR (E)	Aston Martin	NAR (W)	Total
Bro Tathan Access Rd	0	0	0	0	**0**
NAR (E)	0	0	0	5	**5**
Aston Martin	0	0	0	0	**0**
NAR (W)	0	2	0	0	**2**
Total	**0**	**2**	**0**	**5**	**7**

Table 5.18: Resident Land @ Llanmaes Development Trips @ Junction 1 (PM Peak)

PM Peak	Bro Tathan Access Rd	NAR (E)	Aston Martin	NAR (W)	Total
Bro Tathan Access Rd	0	0	0	0	**0**
NAR (E)	0	0	0	4	**4**
Aston Martin	0	0	0	0	**0**
NAR (W)	0	3	0	0	**3**
Total	**0**	**3**	**0**	**4**	**7**

Table 5.19: Resident Land @ Llanmaes Development Trips @ Junction 2 (AM Peak)

AM Peak	St. Athan Rd (N)	Wilson Homes	Cowbridge Rd	NAR	Total
St. Athan Rd (N)	0	0	0	1	**1**
Wilson Homes	0	0	0	0	**0**
Cowbridge Rd	0	0	0	1	**1**
NAR	3	0	3	0	**5**
Total	**3**	**0**	**3**	**2**	**7**

Table 5.20: Resident Land @ Llanmaes Development Trips @ Junction 2 (PM Peak)

PM Peak	St. Athan Rd (N)	Wilson Homes	Cowbridge Rd	NAR	Total
St. Athan Rd (N)	0	0	0	1	**1**
Wilson Homes	0	0	0	0	**0**
Cowbridge Rd	0	0	0	2	**2**
NAR	2	0	2	0	**4**
Total	**2**	**0**	**2**	**3**	**7**

Table 5.21: Resident Land @ Llanmaes Development Trips @ Junction 3 (AM Peak)

AM Peak	Gileston Rd (N)	B4265 (E)	Gileston Rd (S)	B4265 (W)	Total
Gileston Rd (N)	0	2	0	1	**3**
B4265 (E)	1	0	0	5	**5**
Gileston Rd (S)	0	0	0	0	**0**
B4265 (W)	0	14	0	0	**14**
Total	**1**	**16**	**0**	**6**	**22**

Table 5.22: Resident Land @ Llanmaes Development Trips @ Junction 3 (PM Peak)

PM Peak	Gileston Rd (N)	B4265 (E)	Gileston Rd (S)	B4265 (W)	Total
Gileston Rd (N)	0	1	0	1	**2**
B4265 (E)	1	0	0	8	**9**
Gileston Rd (S)	0	0	0	0	**0**
B4265 (W)	1	12	0	0	**12**
Total	**2**	**13**	**0**	**9**	**23**

Table 5.23: Resident Land @ Llanmaes Development Trips @ Junction 4 (AM Peak)

AM Peak	B4265 (N)	NAR	B4265 (S)	Total
B4265 (N)	0	5	0	**5**
NAR	16	0	14	**30**
B4265 (S)	0	5	0	**5**
Total	**16**	**10**	**14**	**40**

Table 5.24: Resident Land @ Llanmaes Development Trips @ Junction 4 (PM Peak)

PM Peak	B4265 (N)	NAR	B4265 (S)	Total
B4265 (N)	0	9	0	**9**
NAR	13	0	12	**25**
B4265 (S)	0	8	0	**8**
Total	**13**	**17**	**12**	**42**

5.4 Assessment Scenario Final Trips

This section presents the final trips for the baseline (WITHOUT development) and proposed (WITH development) assessment scenarios for the AM and PM peak hours at the four surveyed junctions (including committed development).

5.4.1 Final Trips @ Junction 1

Table 5.25: 2022 Baseline Scenario WITHOUT Development @ Junction 1 (AM Peak)

AM Peak	Bro Tathan Access Rd	NAR (E)	Aston Martin	NAR (W)	Total
Bro Tathan Access Rd	0	0	1	5	**6**
NAR (E)	4	0	27	158	**189**
Aston Martin	2	13	0	20	**35**
NAR (W)	5	98	31	0	**134**
Total	**12**	**111**	**59**	**182**	**363**

Table 5.26: 2022 Baseline Scenario WITH Development @ Junction 1 (AM Peak)

AM Peak	Bro Tathan Access Rd	NAR (E)	Aston Martin	NAR (W)	Total
Bro Tathan Access Rd	0	2	1	19	**22**
NAR (E)	22	0	27	158	**206**
Aston Martin	2	13	0	20	**35**
NAR (W)	86	98	31	0	**214**
Total	**110**	**113**	**59**	**196**	**478**

Table 5.27: 2022 Proposed Scenario WITH Development @ Junction 1 (PM Peak)

PM Peak	Bro Tathan Access Rd	NAR (E)	Aston Martin	NAR (W)	Total
Bro Tathan Access Rd	0	5	0	7	**12**
NAR (E)	1	0	10	125	**136**
Aston Martin	5	82	0	93	**180**
NAR (W)	5	124	11	0	**140**
Total	**11**	**211**	**21**	**225**	**468**

Table 5.28: 2022 Proposed Scenario WITH Development @ Junction 1 (PM Peak)

PM Peak	Bro Tathan Access Rd	NAR (E)	Aston Martin	NAR (W)	Total
Bro Tathan Access Rd	0	45	0	65	**110**
NAR (E)	4	0	10	125	**139**
Aston Martin	5	82	0	93	**180**
NAR (W)	18	124	11	0	**153**
Total	**27**	**252**	**21**	**283**	**582**

5.4.2 Final Trips @ Junction 2

Table 5.29: 2022 Baseline Scenario WITHOUT Development @ Junction 2 (AM Peak)

AM Peak	St. Athan Rd (N)	Wilson Homes	Cowbridge Rd	NAR	Total
St. Athan Rd (N)	0	3	47	19	**69**
Wilson Homes	0	0	9	1	**10**
Cowbridge Rd	114	4	0	95	**213**
NAR	20	7	96	0	**122**
Total	**134**	**14**	**152**	**115**	**414**

Table 5.30: 2022 Baseline Scenario WITH Development @ Junction 2 (AM Peak)

AM Peak	St. Athan Rd (N)	Wilson Homes	Cowbridge Rd	NAR	Total
St. Athan Rd (N)	0	3	47	27	**77**
Wilson Homes	0	0	9	1	**10**
Cowbridge Rd	114	4	0	136	**254**
NAR	21	7	103	0	**130**
Total	**135**	**14**	**159**	**164**	**471**

Table 5.31: 2022 Baseline Scenario WITHOUT Development @ Junction 2 (PM Peak)

PM Peak	St. Athan Rd (N)	Wilson Homes	Cowbridge Rd	NAR	Total
St. Athan Rd (N)	0	3	46	7	**56**
Wilson Homes	4	0	6	1	**11**
Cowbridge Rd	66	6	0	83	**155**
NAR	12	1	62	0	**75**
Total	**82**	**10**	**114**	**91**	**297**

Table 5.32: 2022 Baseline Scenario WITH Development @ Junction 2 (PM Peak)

PM Peak	St. Athan Rd (N)	Wilson Homes	Cowbridge Rd	NAR	Total
St. Athan Rd (N)	0	3	46	8	**57**
Wilson Homes	4	0	6	1	**11**
Cowbridge Rd	66	6	0	90	**162**
NAR	19	1	104	0	**124**
Total	**89**	**10**	**156**	**99**	**355**

5.4.3 Final Trips @ Junction 3

Table 5.33: 2022 Baseline Scenario WITHOUT Development @ Junction 3 (AM Peak)

AM Peak	Gileston Rd (N)	B4265 (E)	Gileston Rd (S)	B4265 (W)	Total
Gileston Rd (N)	0	200	5	68	**273**
B4265 (E)	156	0	5	295	**455**
Gileston Rd (S)	8	3	0	6	**17**
B4265 (W)	96	328	2	0	**426**
Total	**260**	**531**	**12**	**369**	**1171**

Table 5.34: 2022 Baseline Scenario WITH Development @ Junction 3 (AM Peak)

AM Peak	Gileston Rd (N)	B4265 (E)	Gileston Rd (S)	B4265 (W)	Total
Gileston Rd (N)	0	205	5	70	**280**
B4265 (E)	183	0	5	295	**482**
Gileston Rd (S)	8	3	0	6	**17**
B4265 (W)	111	328	2	0	**441**
Total	**301**	**536**	**12**	**370**	**1220**

Table 5.35: 2022 Baseline Scenario WITHOUT Development @ Junction 3 (PM Peak)

PM Peak	Gileston Rd (N)	B4265 (E)	Gileston Rd (S)	B4265 (W)	Total
Gileston Rd (N)	0	204	6	82	**292**
B4265 (E)	214	0	3	295	**512**
Gileston Rd (S)	7	3	0	4	**14**
B4265 (W)	96	371	4	0	**470**
Total	**317**	**578**	**13**	**381**	**1288**

Table 5.36: 2022 Baseline Scenario WITH Development @ Junction 3 (PM Peak)

PM Peak	Gileston Rd (N)	B4265 (E)	Gileston Rd (S)	B4265 (W)	Total
Gileston Rd (N)	0	237	6	92	**334**
B4265 (E)	219	0	3	295	**517**
Gileston Rd (S)	7	3	0	4	**14**
B4265 (W)	98	371	4	0	**472**
Total	**324**	**610**	**13**	**391**	**1338**

5.4.4 Final Trips @ Junction 4

Table 5.37: 2022 Baseline Scenario WITH Development @ Junction 4 (AM Peak)

AM Peak	B4265 (N)	NAR	B4265 (S)	Total
B4265 (N)	0	79	247	**326**
NAR	103	0	59	**162**
B4265 (S)	201	51	0	**252**
Total	**304**	**130**	**306**	**740**

Table 5.38: 2022 Baseline Scenario WITH Development @ Junction 4 (AM Peak)

AM Peak	B4265 (N)	NAR	B4265 (S)	Total
B4265 (N)	0	110	247	**357**
NAR	108	0	62	**170**
B4265 (S)	201	70	0	**271**
Total	**309**	**179**	**309**	**797**

Table 5.39: 2022 Baseline Scenario WITH Development @ Junction 4 (PM Peak)

PM Peak	B4265 (N)	NAR	B4265 (S)	Total
B4265 (N)	0	88	251	**339**
NAR	149	0	50	**199**
B4265 (S)	256	24	0	**280**
Total	**405**	**112**	**301**	**818**

Table 5.40: 2022 Baseline Scenario WITH Development @ Junction 4 (PM Peak)

PM Peak	B4265 (N)	NAR	B4265 (S)	Total
B4265 (N)	0	95	251	**346**
NAR	187	0	60	**248**
B4265 (S)	256	25	0	**281**
Total	**443**	**120**	**311**	**875**

6. OPERATIONAL ASSESSMENTS

6.1 Introduction

This section considers the likely impact of the trips attracted and generated by the proposed development on the operation of the local highway network.

As agreed with the VoG Highways, this TA will assess the traffic impact on the local highway network in the AM and PM peak hours in 2022 for two assessment scenarios "without" and "with" the proposed development at the following four junctions:

- Junction 1: Lancaster Avenue / NAR / Aston Martin signal junction.
- Junction 2: NAR / St. Athan Road / Cowbridge Road roundabout.
- Junction 3: B4265 / Cowbridge Road / Gileston Road priority junction.
- Junction 4: B4265 / Northern Access Road (NAR) roundabout.

The "without" development scenario will assess the four junctions for a baseline scenario, considering the 2022 surveyed flows and both committed developments.

The "with" development scenario will assess the four junctions for the proposed scenario, considering the impact of the proposed development (2022 baseline flows + development flows) against the baseline scenario.

No future year assessments have been requested by VoG highways, therefore have none been undertaken.

All geometric information used to model the junctions have been extracted from junction highway drawings obtained from VoG Highways. Copies of the drawings can be found in Appendix 3.

6.2 Junction Assessments

6.2.1 Methodology

Highway capacity assessments of the four surveyed junctions for the AM and PM peak hours have been carried out using ARCADY for the two roundabouts (junctions 2 and 4), PICDAY for the priority junction (junction 3) and LinSig for the signal-controlled junction (junction 1).

ARCADY and PICADY are industry-standard computer programs for predicting capacities, queues, delays and accident risk at roundabouts and priority junctions and have been used to calculate the likely queues generated for each approach within each peak period.

Analysing the output for ARCADY and PICADY, the primary focus is on link capacity and queues. The software results output refers to the Ratio of Flow to Capacity (RFC) and queue lengths (in vehicles) predicted on each arm of the junction. An RFC of 1.00 indicates that the arm in question is operating at its theoretical capacity and this figure could cause undesirable queuing on an approach lane. An RFC of 0.85 or less indicates that the arm is operating within capacity and queues can be accommodated.

LinSig is an industry-standard computer program for predicting capacities, queues and delays at signal controlled junctions and has been used to calculate the likely queues generated for each approach within each peak period at the signalised junction (junction 1).

As with ARCADY and PICADY, when analysing the output from LinSig, the primary focus is on link capacity and queues. The software results output refers to Degree of Saturation (DoS) and Practical Reserve Capacity (PRC) of each arm of the junction. A DoS of 100% indicates that the arm in question is operating at its theoretical capacity and this figure could cause undesirable queuing on an approach lane. A DoS of 0.90 or less indicates that the arm is operating within capacity and queues can be accommodated. The PRC is related to the DoS and considers the overall operation of the junction. A positive PRC indicates that a junction has spare capacity and may be able to accept more traffic. A negative PRC indicates that the junction is close to or overcapacity and is suffering from traffic congestion.

The results of the junction assessments for the four surveyed junctions in 2022 "without" and "with" the development are presented below and present the modelled queues, delay and RFC for the priority junction and roundabouts or the DoS for the signal junction.

Outputs of all the junction assessments for both scenarios for the AM and PM peaks can be found in Appendices 4 to 7.

6.2.2 Junction Validation

For the validation of the junction models, queue lengths have been extracted from the LinSig, ARCADY and PICADY outputs and compared to the surveyed queues. The modelled and surveyed queues are presented in the following summary tables (Tables 6.1 to 6.4) for each assessment.

The surveyed queues column shows the averaged surveyed queues for each arm with maximum surveyed queues shown in brackets. Queue lengths are validated when modelled flows lie approximately between the minimum and maximum surveyed flows.

Table 6.1: Junction 1 Validation – 2022 LinSig Results (AM & PM Peak)

Arm	AM				PM			
	Queue (PCUs)		Delay (PCU/hr)	DoS (%)	Queue (PCUs)		Delay (PCU/hr)	DoS (%)
	Survey	Model			Survey	Model		
2022 Baseline								
Lancaster Avenue Left Ahead Right	0.2 (2)	0.1	0.1	2.6	0 (0)	0.1	0.1	3.0
NAR (West) Right Left Ahead	0.9 (3)	2.4	1.1	31.6	0.6 (3)	2.0	1.0	30.9
Aston Martin Left	0 (0)	0.1	0.0	1.5	0 (0)	1.0	0.3	11.2
Aston Martin Ahead Right Left	0 (0)	0.2	0.2	5.8	0 (0)	1.5	0.8	30.1
NAR (East) Left Ahead Right	1.7 (5)	1.6	0.9	31.9	0.2 (2)	2.0	1.0	33.1
NAR (East) Right	1.7 (5)	0.5	0.3	11.1	0.2 (2)	0.2	0.1	3.2
	Cycle Time (s) = 60 Total Delay (pcuhr) = 2.50 PRC = 182%				**Cycle Time (s) = 60 Total Delay (pcuhr) = 3.23 PRC = 172.2%**			

Table 6.2: Junction 2 Validation – 2022 ARCADY Results (AM & PM Peak)

Arm	AM				PM			
	Queue (PCUs)		Delay (PCU/hr)	RFC	Queue (PCUs)		Delay (PCU/hr)	RFC
	Survey	Model			Survey	Model		
2022 Baseline								
St. Athan Road	1.3 (4)	0.1	4.39	0.08	0.6 (3)	0.1	4.20	0.07
Wilson Homes	0.0 (0)	0.0	3.36	0.01	0 ()	0.0	3.25	0.01
Cowbridge Road	0.6 (3)	0.2	3.60	0.19	1.3 (4)	0.2	3.35	0.14
Northern Access Road	1.9 (4)	0.1	3.58	0.11	1.3 (3)	0.1	3.35	0.07
	Junction LOS = A **Total Delay (s) = 3.72** **Residual Capacity = 371%**				**Junction LOS =A** **Total Delay (s) = 3.51** **Residual Capacity = 563%**			

Table 6.3: Junction 3 Validation – 2022 PICADY Results (AM & PM Peak)

Arm	AM				PM			
	Queue (PCUs)		Delay (PCU/hr)	RFC	Queue (PCUs)		Delay (PCU/hr)	RDC
	Survey	Model			Survey	Model		
2022 Baseline								
B4265 (West)	0 (0)	0.0	9.07	0.05	0 (0)	0.0	10.07	0.04
Gileston Road (North)	4.4 (9)	0.4	7.38	0.25	4.2 (9)	0.9	9.04	0.41
B4265 (East)	2.5 (6)	1.1	13.29	0.51	2.7 (6)	1.1	14.58	0.52
Gileston Road (South)	0.3 (2)	0.0	6.46	0.00	0 (0)	0.0	6.81	0.01
	Junction LOS = A **Total Delay (s) = 4.01** **Residual Capacity = 34%**				**Junction LOS =A** **Total Delay (s) = 4.62** **Residual Capacity = 26%**			

Table 6.4: Junction 4 Validation – 2022 PICADY Results (AM & PM Peak)

Arm	AM				PM			
	Queue (PCUs)		Delay (PCU/hr)	RFC	Queue (PCUs)		Delay (PCU/hr)	RFC
	Survey	Model			Survey	Model		
2022 Baseline								
B4265 (East)	0.3 (2)	0.3	3.08	0.22	0.3 (2)	0.3	2.94	0.22
Proposed NAR	0.3 (2)	0.1	2.42	0.09	0.9 (3)	0.1	2.50	0.12
B4265 (West)	0 (0)	0.2	2.60	0.16	0.9 (4)	0.2	2.73	0.17
	Junction LOS = A Total Delay (s) = 2.79 Residual Capacity = 309%				**Junction LOS =A Total Delay (s) = 2.77 Residual Capacity = 317%**			

6.2.3 Junction 1: Lancaster Avenue / NAR / Aston Martin signal junction

The existing Lancaster Avenue / NAR / Aston Martin signal junction represents the point at which the Lancaster Avenue connects with the local highway network (NAR) and has been assessed using LinSig for both assessment scenarios (2022 Baseline and 2022 Baseline + Development) for the AM and PM peak hours.

Results of the assessment "without" and "with" the development are summarised in Tables 6.5 to 6.6 and the full assessment outputs for all scenarios can be found in Appendix 4.

Table 6.5: Junction 1 WITHOUT Development – 2022 LinSig Results (AM & PM Peak)

Arm	AM			PM		
	Queues (PCUs)	Delay (PCU/hr)	DoS (%)	Queues (PCUs)	Delay (PCU/hr)	DoS (%)
2022 Baseline						
Lancaster Avenue Left Ahead Right	0.1	0.1	2.6	0.1	0.1	3.0
NAR (West) Right Left Ahead	2.4	1.2	32.7	2.1	1.0	31.9
Aston Martin Left	0.1	0.0	1.0	1.0	0.3	11.6
Aston Martin Ahead Right Left	0.2	0.2	5.8	1.6	0.8	33.9
NAR (East) Left Ahead Right	1.7	0.9	32.6	2.0	1.0	31.4
NAR (East) Right	0.5	0.3	11.1	0.2	0.1	3.0
	Cycle Time (s) = 60 **Total Delay (pcuhr) = 2.57** **PRC = 174.8%**			**Junction LOS =A** **Total Delay (s) = 3.30** **Residual Capacity = 165.7%**		

Table 6.6: Junction 1 WITH Development – 2022 LinSig Results (AM & PM Peak)

Arm	AM			PM		
	Queues (PCUs)	Delay (PCU/hr)	DoS (%)	Queues (PCUs)	Delay (PCU/hr)	DoS (%)
2022 Baseline + Development						
Lancaster Avenue Left Ahead Right	0.3	0.2	8.7	1.2	0.8	28.3
NAR (West) Right Left Ahead	2.8	1.3	36.3	2.1	1.0	32.8
Aston Martin Left	0.1	0.0	1.0	1.0	0.3	11.2
Aston Martin Ahead Right Left	0.2	0.2	5.8	1.6	0.8	33.9
NAR (East) Left Ahead Right	2.0	1.4	38.1	2.0	1.0	31.6
NAR (East) Right	0.3	0.1	5.7	0.2	0.1	3.0
	Junction LOS = A **Total Delay (s) = 3.20** **Residual Capacity = 136.4%**			**Junction LOS =A** **Total Delay (s) = 5.82** **Residual Capacity = 38%**		

The results of the 2022 Baseline junction assessments identify that the junction operates well within capacity for the Baseline scenario in both the AM and PM peak hours with a maximum DoS of 33.9% on the Aston Martin arm during the PM peak with a maximum predicted queue of 1.6 vehicles.

With the addition of the development flows, the junction continues to operate well within capacity with a maximum DoS of 0.381 on the NAR (East) arm during the AM peak with a maximum queue of 2.8 vehicles on the NAR (West) arm.

The results of the assessments identify that the development has no material impact on the operation of the junction.

The outputs of the LinSig junction assessments for both scenarios for the AM and PM peaks can be found in Appendix 4.

6.2.4 Junction 2: NAR / St. Athan Road / Cowbridge Road roundabout

The existing NAR / St. Athan Road / Cowbridge Road roundabout has been assessed using ARCADY for both assessment scenarios (2022 Baseline and 2022 Baseline + Development) for the AM and PM peak hours.

Results of the assessment "without" and "with" the development are summarised in Tables 6.7 to 6.8 and the full assessment outputs for all scenarios can be found in Appendix 5.

Table 6.7: Junction 2 WITHOUT Development – 2022 ARCADY Results (AM & PM Peak)

Arm	AM			PM		
	Queues (PCUs)	Delay (PCU/hr)	RFC	Queues (PCUs)	Delay (PCU/hr)	RFC
2022 Baseline						
St. Athan Road	0.1	4.55	0.09	0.1	4.28	0.07
Wilson Homes	0.0	3.68	0.01	0.0	3.26	0.01
Cowbridge Road	0.2	3.61	0.19	0.2	3.36	0.14
Northern Access Road	0.1	3.66	0.12	0.1	3.36	0.07
	Junction LOS = A			**Junction LOS =A**		
	Total Delay (s) = 3.79			**Total Delay (s) = 3.53**		
	Residual Capacity = 367%			**Residual Capacity = 553%**		

Table 6.8: Junction 2 WITH Development – 2022 ARCADY Results (AM & PM Peak)

Arm	AM			PM		
	Queues (PCUs)	Delay (PCU/hr)	RFC	Queues (PCUs)	Delay (PCU/hr)	RFC
2022 Baseline + Development						
St. Athan Road	0.1	4.60	0.10	0.1	4.38	0.07
Wilson Homes	0.0	3.71	0.01	0.0	3.33	0.01
Cowbridge Road	0.3	3.81	0.23	0.2	3.38	0.14
Northern Access Road	0.2	3.69	0.13	0.1	3.54	0.12
	Junction LOS = A			**Junction LOS =A**		
	Total Delay (s) = 3.91			**Total Delay (s) = 3.60**		
	Residual Capacity = 288%			**Residual Capacity = 524%**		

The results of the 2022 Baseline junction assessments identify that the junction operates well within capacity for the Baseline scenario in both the AM and PM peak hours with a maximum RFC 0.19 on the Cowbridge Road arm during the AM peak with no predicted queues at the junction.

With the addition of the development flows, the junction continues to operate well within capacity with a maximum RFC of 0.23 on the Cowbridge Road arm during the AM peak with no predicted queues at the junction.

The results of the assessments identify that the development has no material impact on the operation of the junction.

The outputs of the ARCADY junction assessments for both scenarios for the AM and PM peaks can be found in Appendix 5.

6.2.5 Junction 3: B4265 / Cowbridge Road / Gileston Road priority junction

The existing B4265 / Cowbridge Road / Gileston Road priority junction has been assessed using PICADY for both assessment scenarios (2022 Baseline and 2022 Baseline + Development) for the AM and PM peak hours.

Results of the assessment "without" and "with" the development are summarised in Tables 6.9 to 6.10 and the full assessment outputs for all scenarios can be found in Appendix 6.

Table 6.9: Junction 3 WITHOUT Development – 2022 PICADY Results (AM & PM Peak)

Arm	AM			PM		
	Queues (PCUs)	Delay (PCU/hr)	RFC	Queues (PCUs)	Delay (PCU/hr)	RFC
2022 Baseline						
B4265 (West)	0.0	9.03	0.04	0.0	10.06	0.04
Gileston Road (North)	0.5	7.43	0.29	0.9	8.78	0.42
B4265 (East)	1.1	13.62	0.53	1.7	18.80	0.63
Gileston Road (South)	0.0	6.53	0.00	0.0	6.84	0.01
	Junction LOS = A **Total Delay (s) = 4.41** **Residual Capacity = 32%**			**Junction LOS =A** **Total Delay (s) = 5.99** **Residual Capacity = 15%**		

Table 6.10 Junction 3 WITH Development – 2022 PICADY Results (AM & PM Peak)

Arm	AM			PM		
	Queues (PCUs)	Delay (PCU/hr)	RFC	Queues (PCUs)	Delay (PCU/hr)	RFC
2022 Baseline + Development						
B4265 (West)	0.0	9.36	0.05	0.0	10.26	0.04
Gileston Road (North)	0.7	8.16	0.36	0.9	9.01	0.43
B4265 (East)	1.3	15.45	0.57	2.5	24.72	0.72
Gileston Road (South)	0.0	6.69	0.00	0.0	6.89	0.01
	Junction LOS = A **Total Delay (s) = 5.03** **Residual Capacity = 24%**			**Junction LOS =A** **Total Delay (s) = 7.93** **Residual Capacity = 7%**		

The results of the 2022 Baseline junction assessments identify that the junction operates well within capacity for the Baseline scenario in both the AM and PM peak hours with a maximum RFC 0.63 on the B4265 (East) arm during the PM peak with a maximum predicted queue of 1.7 vehicles on this arm.

With the addition of the development flows, the junction continues to operate well within capacity with a maximum RFC of 0.72 on the B4265 (East) arm during the PM peak with a maximum predicted queue of 2.5 vehicles on this arm.

The results of the assessments identify that the development has no material impact on the operation of the junction.

The outputs of the PICADY junction assessments for both scenarios for the AM and PM peaks can be found in Appendix 6.

6.2.6 Junction 4: B4265 / NAR roundabout

The existing B4265 / NAR roundabout has been assessed using ARCADY for both assessment scenarios (2022 Baseline and 2022 Baseline + Development) for the AM and PM peak hours.

Results of the assessment "without" and "with" the development are summarised in Tables 6.11 to 6.12 and the full assessment outputs for all scenarios can be found in Appendix 7.

Table 6.11: Junction 4 WITHOUT Development – 2022 ARCADY Results (AM & PM Peak)

Arm	AM			PM		
	Queues (PCUs)	Delay (PCU/hr)	RFC	Queues (PCUs)	Delay (PCU/hr)	RFC
2022 Baseline						
B4265 (North)	0.3	2.95	0.23	0.3	2.85	0.23
NAR	0.1	2.51	0.11	0.2	2.55	0.13
B4265 (South)	0.2	2.66	0.17	0.2	2.80	0.19
	Junction LOS = A Total Delay (s) = 2.76 Residual Capacity = 290%			**Junction LOS =A Total Delay (s) = 2.76 Residual Capacity = 294%**		

Table 6.12: Junction 4 WITH Development – 2022 ARCADY Results (AM & PM Peak)

Arm	AM			PM		
	Queues (PCUs)	Delay (PCU/hr)	RFC	Queues (PCUs)	Delay (PCU/hr)	RFC
2022 Baseline + Development						
B4265 (North)	0.4	3.05	0.25	0.3	2.87	0.23
NAR	0.1	2.53	0.12	0.2	2.64	0.17
B4265 (South)	0.2	2.71	0.18	0.2	2.87	0.20
	Junction LOS = A Total Delay (s) = 2.82 Residual Capacity = 250%			**Junction LOS =A Total Delay (s) = 2.80 Residual Capacity = 270%**		

The results of the 2022 Baseline junction assessments identify that the junction operates well within capacity for the Baseline scenario in both the AM and PM peak hours with a maximum RFC 0.23 on the B4265 northbound arm during the AM and PM peak hours with no predicted queues at the junction.

With the addition of the development flows, the junction continues to operate well within capacity with a maximum RFC of 0.25 on the B4265 (North) arm during the AM peak with no predicted queues at the junction.

The results of the assessments identify that the development has no material impact on the operation of the junction.

The outputs of the ARCADY junction assessments for both scenarios for the AM and PM peaks can be found in Appendix 7.

6.2.7 Summary

The results of the junction assessments identify that the four existing network junctions all operate within capacity during the 2022 Baseline scenario and when the development flows are added at each of the four surveyed junctions, the junctions continue to operate well within capacity with no predicted additional queues.

The results of the assessments demonstrate that the development will have no material impact on the operation of the existing four surveyed junctions and all junctions will have plenty of spare capacity.

Outputs for all the junction assessments can be found in Appendices 4 to 7.

7. SWEPT PATH ANALYSIS

Swept path analysis has been undertaken around the proposed development site layout for an HGV and a mobile crane as presented in Appendix 8.

7.1 HGV

Tracking for a large articulated HGV (16.480m in length) has been undertaken around the proposed scheme layout.

Drawing CWL2-DR-SP-C144-V0-WS2-BUR in Appendix 8 demonstrates that the vehicle can enter the site via the main vehicular entrance (in the north-east corner of the site) and the emergency access (to the south of the site), manoeuvre safely around the sites internal access roads and exit via both vehicular exits. The drawing also shows the vehicle can access the Substation via the emergency access road, manoeuvre safely around substation access road (that surrounds the substation) and exit back out onto the emergency access road.

Drawing CWL2-DR-SP-C149-V0-WS2-BUR also demonstrates that the large articulated HGV can safely manoeuvre in and out of the HGV loading/unloading areas for each of the three data centre buildings.

7.2 Mobile Crane

Tracking for a mobile crane (21.380m in length) has been undertaken around the proposed scheme layout.

Drawing CWL2-DR-SP-C148-V0-WS2-BUR in Appendix 8 demonstrates that the vehicle can enter the site via the main vehicular entrance (in the north-east corner of the site) and the emergency access (to the south of the site), manoeuvre safely around the sites internal access roads and exit via both vehicular exits.

8. POLICY COMPLIANCE

Table 8.1 summarises the compliance of the proposed development with relevant national and local transport policy.

Table 8.1: Policy compliance.

Policy Requirement	Policy Compliance
National Policy	
Planning Policy Wales	
Development proposals should prioritise sustainable travel movements over car travel, maximising accessibility by walking, cycling and public transport.	An interim Travel Plan has been produced with the aim of promoting sustainable travel options to/from the site. The site is located close to local bus stops and walking/cycling routes and the Travel Plan will help inform all site users of how to travel to/from site more sustainably using existing and proposed facilities.
The residual impact of any development to the local road network should be considered, with appropriate mitigation provided if required. This is achieved through the provision of a policy compliant Transport report, which will evidence the suitability of the development proposal and outline development impact at operation.	This Transport Assessment demonstrates that the proposed development is policy compliant with respect to transport and does not present any adverse impacts on the local highway network. The proposed development improves access for pedestrians and cyclists compared to the existing context and helps facilitate improved sustainable travel options to/from the site.
Future Wales - The National Plan (2040)	
Developments should provide infrastructure that encourages sustainable travel, prioritising trips by walking, cycling and public transport.	The proposed development improves access for pedestrians and cyclists compared to the existing context and will provided a new 3m shared footway/cycleway between the site and the NAR which will help facilitate improved access to local walking/cycling routes and bus stops.
Transport Assessments should provide the following information: • The transport impacts of the development; • The impacts to assist the decision-making process; • Demonstrate the development is sited in a location that will produce a desired and predicted output (for example in terms of target modal split); • Mitigate negative transport impacts through the design process and secured through planning conditions or obligations; and, • Maximise the accessibility of the development by non-car modes.	This Transport Assessment provides all the relevant information for Transport Assessments in Wales as set in 'Future Wales – The National Plan (2040)' document.
Llwybr Newydd: The Wales Transport Strategy (2021)	
The document sets out the Welsh Government's priorities for Transport in Wales over the next five years, one of the priorities being to bring services to people to reduce the need for people to use their cars daily. To achieve this, new workplaces and homes will be built close to public transport interchanges and new developments will be designed to be walk and cycle friendly from the outset.	The proposed development is compliant with Welsh transport strategy by designing the development to be walking and cycling friendly through the delivery of high-quality walking and cycling facilities and the creation of the new 3m shared-use pedestrian/cycle path that will link the site to nearby sustainable travel options (pedestrian footpaths, cycleways, bus stops, train station).

Local Policy	
Vale of Glamorgan Local Development Plan	
Policy SP7(2) emphasises the strategic importance of a new Ffordd Bro Tathan to facilitate the future development of Bro Tathan at St. Athan as part of the Enterprise Zone, additionally, walking and cycling infrastructure will be incorporated within SP7(2) to link St. Athan with Llantwit Major	The proposed development is being proposed on land ear marked for development and future growth of the area. As part of the proposals a new shared-use pedestrian/cycle path will link the site to the NAR and nearby sustainable travel options.
Vale of Glamorgan Local Development Plan: Supplementary Planning Guidance	
The SPG includes information on the Council's requirements in relation to the provision of infrastructure for car parking including the provision of spaces for disabled users and Ultra Low Emission Vehicles (ULEVs).	The proposed development will provide XX car parking spaces in line with VoG parking standards of which XX spaces will for disabled users and XX spaces will be ULEVs.
For cycle parking, short stay and long stay parking are separately considered. Short stay parking addresses the needs of customers or other visitors to a development, whereas long stay parking is applicable to the needs of staff. Staff should also be encouraged to cycle to work by the provision of additional facilities such as lockers, changing areas and showers.	The proposed development will provide 30 covered and secure cycle parking spaces in line with VoG parking standards. The development will also actively enforce its Travel Plan and try and encourage staff to travel more sustainably, especially by bicycle if appropriate. High quality cycle facilities such a cycle friendly routes, lockers, changing areas and showers will also be provided to encourage staff to cycle to/from the development.
Vale of Glamorgan Local Transport Plan (2015-2030)	
The VoG Local Transport Plan 2015–2030 (LTP) recognises the need for a collaborative approach to help deliver enhanced mobility for both residents and visitors, with greater accessibility to jobs and services, thereby unlocking the potential for sustainable economic growth.	The proposed development operators have engaged extensively with VoG council in effort to develop their building in a enterprise zone with enhanced mobility which will allow both staff and visitors to easily access the site which will help the economic prosperity of the site and surrounding area.

9. SUMMARY & CONCLUSION

This Transport Assessment (TA) has been prepared by Ramboll on behalf of F1 Enzo Properties ('the applicant') to support a full planning application for the proposed CWL-C Data Centre on vacant land off Northern Access Road in St. Athan, Wales.

The development proposals are for the construction of three data centre buildings (totalling 72,430 sqm in gross floor area) and single substation with associated plant, equipment, parking and manoeuvring space, landscaping and drainage works.

The proposed development will provide XX car parking spaces in line with current VoG parking standards of which XX spaces will be disabled access spaces. In total there will XX EV charging spaces (10%) with XX spaces allocated within standard car parking spaces and one EV space allocated within a disabled access space. The locations of all the different type of spaces are shown on the general arrangement plan in Appendix 2.

The proposed development is expected to generate approximately 200 two-way (arriving and departing) person trips across a typical day, of which 122 two-way trips will be car-based trips, 64 two-way will be active travel trips (either walking or cycling) and the remaining 14 two-way trips will be public transport, taxi or motorcycle/scooter trips.

Servicing/delivery will be…
The servicing/delivery bay has sufficient turning space to enable all vehicles to leave in forward gear.

Four junctions at strategic locations around the local highway network have been assessed to assess the impact of the proposed development vehicle trips on the local highway network.

The proposed development will improve pedestrian and cycle access through the extension of the 3m shared pedestrian/cycle lane from the NAR along the eastern boundary to the main site entrance. This will provide a high-quality pedestrian and cycle link from the site to the existing pedestrian and cycle network.

An Interim Travel Plan has been developed for the site, which will be promoted to all staff and users of the proposed development, to help promote sustainable travel choices to/from the development. This Travel Plan will be updated to the Full Travel Plan once the new building has been fully occupied for over 6 months.

A Construction Management Plan (CMP) will be produced to mitigate any impact of the proposed development construction during the construction phase.

This Transport Assessment has demonstrated that the proposed development is policy compliant with respect to transport and does not present any adverse impacts on the local highway network. The proposed development improves access for pedestrians and cyclists compared to the existing context and helps facilitate improved sustainable travel options.

In conclusion, it is considered that the proposed development should be supported by VoG Highways on highway and transport grounds.

APPENDIX 1
CORRESPONDENCE WITH VALE OF GLAMORGAN

APPENDIX 2
GENERAL ARRANGEMENT PLAN

APPENDIX 3
HIGHWAY JUNCTION DRAWINGS

APPENDIX 4
JUNCTION 1: LANCASTER AVENUE / NAR / ASTON MARTIN SIGNAL JUNCTION - LINSIG OUTPUT

APPENDIX 5
JUNCTION 2: NAR / ST. ATHAN ROAD / COWBRIDGE ROAD ROUNDABOUT - ARCADY OUTPUT

APPENDIX 6
JUNCTION 3: B4265 / COWBRIDGE ROAD / GILESTON ROAD PRIORITY JUNCTION - PICADY OUTPUT

APPENDIX 7
JUNCTION 4: B4265 / NAR ROUNDABOUT

APPENDIX 8
SWEPT PATH ANALYSIS DRAWINGS