Gwent Police Operational Facility

Transport Assessment

Wilmott Dixon Construction Ltd

Project Number: 60693552

August 2023

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Quality information

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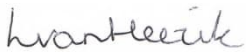			
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Table of Contents

Figures

Tables

Appendices

1. Introduction

1.1 Introduction

1.1.1 This Transport Assessment (TA) has been prepared by AECOM on behalf of Wilmott Dixon Construction Ltd in respect of a planning application to redevelop an existing Gwent Police setting to build a new operational facility for Gwent Police with associated parking.

1.1.2 The existing site comprises three buildings and extensive parking facilities. The existing buildings served as part of the Gwent Police Head Quarters. Gwent Police has, over recent time, relocated the Police Headquarters to another local facility in order to accommodate the aspirations for an Operating Facility. The site does currently benefit from an existing consent to operate Police services and the buildings have not been demolished.

1.1.3 The development proposals include the demolition of the existing buildings on the premises and the construction of a new purpose built Operational Facility for Gwent Police. This will include a Police Hub with custody suites, Specialist Training Facility and Vehicle Workshop. The purpose of the Proposed Development is to consolidate services across the constabulary to improve efficiencies. This premises was identified as a suitable location for the centralisation of services due to the easy access to the A4042 which is an important highway connection in the region. By designating the proposed police hub as the main custody facility for the area, this will significantly reduce travel times for the transportation of custody detainees, thereby reducing vehicle kilometres over the wider network.

1.1.4 The new facility will employ a total of 348 staff and operate on a 24-hour basis in order to meet the operational requirements of the proposed use. Staff will work shift patterns meaning that the maximum number of staff on site at any one time is anticipated to be 251 (during shift changeovers). The premises is currently served by an access off Turnpike Road and by an access from the Crownbridge School Roundabout. These will be retained and incorporated as part of the access strategy for the site. An on-site car park comprising a total of 299 spaces will be provided for staff, visitors and operational vehicles. Sustainable travel to the premises will be facilitated through secure cycle parking and Electric Vehicle (EV) charging points. A Travel Plan (TP) will be submitted as part of this planning application and will aim to embed sustainable travel practices at the site.

1.1.5 A Transport Assessment Scoping Note has been submitted to Torfaen County Borough Council Local Highway Authority (LHA). This sets out the intended Scope of work for this Transport Assessment, based on experience of similar schemes and on knowledge of the existing site and operations. Liaison with the LHA will continue through the Pre-Application Consultation (PAC) period and into the formal planning submission. A copy of the Scoping Note is contained at **Appendix A**.

1.2 Site Location

1.2.1 The proposed site is located in Cwmbran, and is accessed via Turnpike Road, a 30mph single carriageway road. The development site was formerly used and operated as Gwent Police Headquarters and is located in Llanyravon, Cwmbran. Gwent Police Headquarters has recently been relocated to a premises on Llantarnam Park Way to the south of Cwmbran. The majority of services that used to be based at the site off Turnpike Road has already been moved to their new setting. The boundary of the Proposed Development is shown in **Figure 1-1**.

Figure 1-1: Proposed Development Boundary

1.3 BREEAM

1.3.1 The Proposed Development has been assessed in reference to the latest BREEAM guidance. BREEAM is a platform for assessing the sustainability credentials for the built environment. The two BREEAM topic areas which relate specifically to Transportation and are considered in this Transport Assessment and relevant areas are also considered with the Travel Plan: Tra01 'Transport Assessment and Travel Plan', and Tra02 'Sustainable Transport Measures'. For each topic, a number of credits are available which contribute towards the overall BREEAM rating for a new development.

1.3.2 Tra01 aims 'to reward awareness of existing local transport and identify improvements to make it more sustainable'. Two credits are available for the following:

- Undertake a site-specific Transport Assessment that includes current and future travel patterns and the impact of travel associated with site users and the development proposals, an appraisal of existing opportunities for travel by sustainable modes (i.e., walking and cycling, public transport), and the location of existing amenities in relation to the site.
- The preparation of a Travel Plan that provides a long-term management strategy which encourages more sustainable travel to and from the development. This process should involve the end-user of the development (if possible), and there should be a commitment to the implementation of the measures contained in the travel plan.

1.3.3 Section 2 of this TA provides an audit of existing accessibility to the site by all modes of transport. This includes a calculation of the public transport Accessibility Index (AI) and assessment of the current accessibility to local amenities, in accordance with the methodologies contained in the BREEAM guidance.

1.3.4 A TP is intended to be submitted as part of this planning application that aims to promote the use of the most sustainable forms of travel for all types of journeys associated with the new facility. This will be produced in consultation with the site occupier to ensure that the document aligns with operational requirements.

1.3.5 Tra02 aims 'to maximise the potential for local public, private and active transport through provision of sustainable transport measures appropriate to the site'. A pre-requisite to being assessed on this topic is the achievement of the criteria contained in Tra01. There are 10 credits are available for the provision of the following:

- Award credits (according to the existing AI score for the development) based on the number of sustainable transport measures implemented, covering public transport, private transport and active travel.

1.3.6 Section 2 of this TA presents the existing sustainable transport measures and local amenities in close proximity to the proposed Hub. Section 3 of this TA describes the measures that will be implemented at the Proposed Development to improve sustainable access.

1.4 Report Structure

1.4.1 This TA is structured as follows:

- **Chapter 2 – Existing Situation and Site Accessibility:** Provides a description of the site location and its existing usage, the local highway network, prevailing highway safety conditions, and accessibility to non-car modes of travel;
- **Chapter 3 – Development Proposals:** Describes the development proposals, including proposed means of access, internal site layout and parking provision;
- **Chapter 4 – Planning Policy Review:** Considers the development in the context of relevant national and local planning and transport policy;
- **Chapter 5 – Trip Generation and Distribution:** Sets out the trip generation of the development proposals based on forecast staffing levels and shift arrangements, including a proposed method of distribution onto the highway network and a high level assessment of traffic impact;
- **Chapter 6 – Traffic Impact Assessment:** Examines the impact of the development proposals on the highway network during the AM and PM peak hours;
- **Chapter 7 – Transport Implementation Strategy:** Sets out objectives and targets in managing travel demand, whilst detailing the infrastructure and measures necessary to achieve them;
- **Chapter 8 – Summary and Conclusions:** Summarises the key findings and conclusions of this TA; and
- **Chapter 9 – BREEAM Compliance:** Summarises compliance to BREEAM criteria.

2. Existing Site and Accessibility

2.1 Introduction

2.1.1 This section of the TA provides a description of the site location and its existing usage, the local highway. network, recent highway safety record and traffic conditions, and accessibility to non-car modes of travel.

2.2 Site Location and Existing Usage

2.2.1 The site is located east of Cwmbran on the periphery of the urban settlement. The premises has two access points, one from the north of the site off the roundabout on Turnpike Road and the other from the southwest of the site, after exiting off Turnpike Roundabout. The A4042 runs parallel to the site. The site is situated approximately 1.20km from the Cwmbran Railway Station (crow flies distance). The boundary for the Proposed Development is shown in **Figure 1-1**.

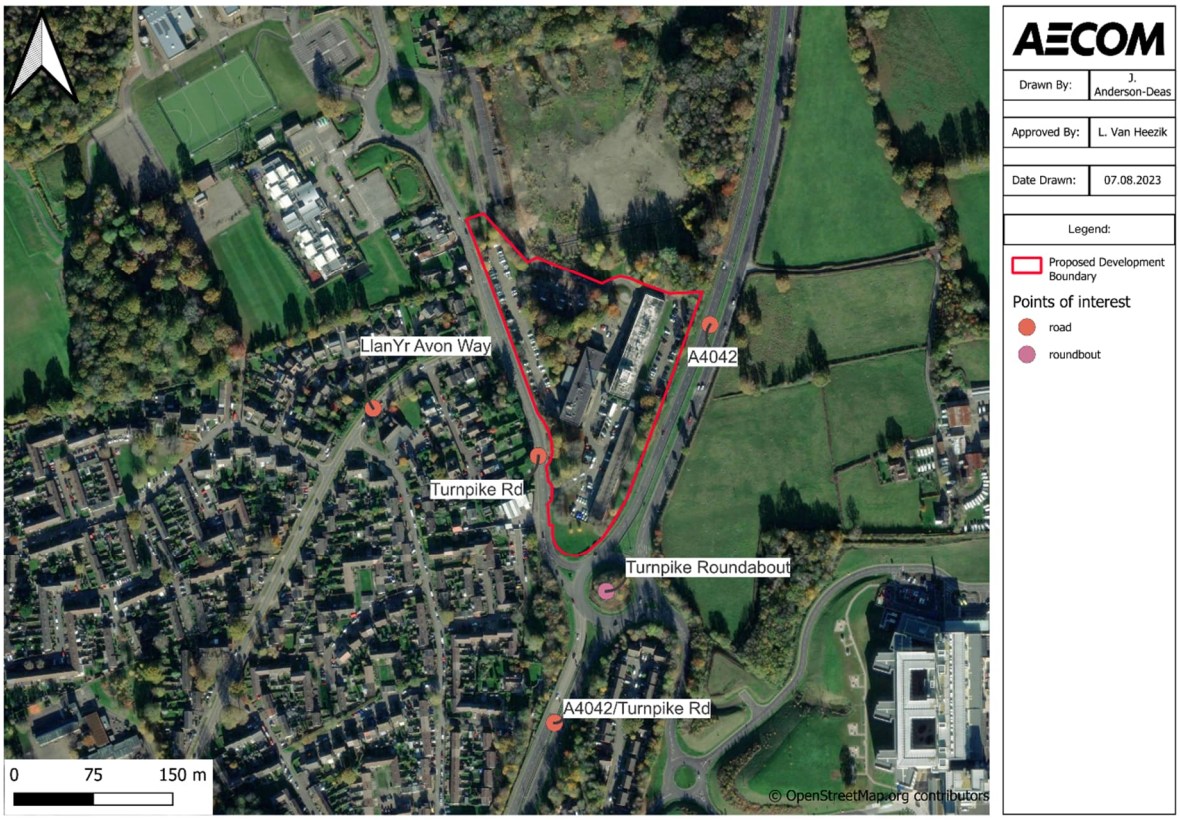
2.2.2 The development site was formerly used as Gwent Police Headquarters and is located in Llanyravon, Cwmbran. Gwent Police Headquarters has been relocated to a premises on Llantarnam Park Way to the south of Cwmbran. The majority of services that used to be based at the site off Turnpike Road has already been moved to their new setting. However, the buildings remain in place and therefore the consented land use is also considered to be valid. At full operation, the Police Headquarters had capacity for approximately 480 staff on-site and there are currently 307 parking spaces.

2.2.3 Gwent Police Operations works closely with the neighbouring Cwmbran Police Station. Cwmbran Police Station is located within the town centre accessed from Tudor Road which is a one-way road.

2.3 Local Highway Network

2.3.1 The following section provides a description of the characteristics of the local highway network surrounding the Proposed Development location. The roads described are labelled and shown on **Figure 2-1**, for ease of reference.

Figure 2-1: Local Highway Network



Turnpike Road

2.3.2 Turnpike Road is a single carriageway highway outside the entrance of the site. Turnpike Road provides access to the Gwent Police Station, Crownbridge School, Discount Pram Centre, and access to the residential area Llanyravon via LlanYr Avon Way. This section of Turnpike Road is subject to 30mph speed restriction. A pedestrian refuge island is located approximately 100m north of the site access junction with Turnpike Road. Turnpike Road includes right hand turning lanes at the entry of the Proposed Development and junction Llan-Yr Avon Way allowing traffic flow to continue while road users wait.

Turnpike Roundabout

2.3.3 Turnpike Roundabout is located to the south of the Proposed Development and has four arms: clockwise these are the A4042 Croesyceiliog Bypass, Caerleon Round, the A4042 Turnpike Road and Turnpike Road. The east arm leads to the Grange University Hospital via Caerleon Round. The south arm along A4042 takes road user towards Newport. Turnpike Roundabout, the western arm, leads to access to the Proposed Development via Turnpike Road.

A4042/ Turnpike Road

2.3.4 The A4042 Turnpike Road near the site is segregated dual carriageway. The A4042 starts south of Abergavenny and travels south towards Little Mill, North of Pontypool. The section relevant to this Proposed Development, A4042 / Turnpike Road, is approximately 1.4km long and stretches between Turnpike Roundabout and Crown Roundabout. The A4042 provides a bypass for road users travelling from New Inn to Newport reducing traffic through Cwmbran. The A4042 / Turnpike Road is a multi-functional route with numerous destinations available from both roundabouts. Junctions at Turnpike Roundabout give access to The Grand University Hospital via Caerleon Road (single carriageway) and Turnpike Road. Junctions at Crown Roundabout provide access to the residential area on Crown Road, industrial estate via Newport road, residential area and Boating Lake on LlanYr Avon Way. Finally Crown Roundabout provides a junction to continue the A4042 south.

A4042/ Croesyceiliog Bypass

2.3.5 The A4042/ Croesyceiliog Bypass runs east of Cwmbran and runs parallel to the Proposed Development. This section of the A4042 is approximately 2km and is between Edlogan Way Roundabout and Turnpike Roundabout. Turnpike Roundabout access points are discussed above. The Edlogan Way Roundabout provides access to Cwmbran via Edlogan Way while Tre-Herbert Road provides access to the Sunnydale Garden Centre. The A4042 continues north towards the New Inn.

Llan-Yr Avon Way

2.3.6 Llan-Yr Avon Way is a single carriageway providing access to Llanyravon. This is a multi-functional route providing access to residential area, Llanyrafron Primary School, Llanyravon Surgery, Llanyrafon Social Club, and Llanyrafon Methodist Church. Llan-Yr Avon Way is subject to a 20mph speed limit zone and has numerous speed bumps and a maximum weight limit of 7.5 tonnes to further control traffic and vehicle types.

2.4 Existing Highway Operation

2.4.1 As part of the Transport Assessment to accompany the planning application (23/P/0430/FUL) for the expansion of the Emergency Department at The Grange University Hospital Manual Classified Count (MCC) survey data for the Turnpike Road Roundabout. This is publicly available information and a copy of this is provided in **Appendix B**. The survey was conducted on Thursday the 16th June 2022 and covers the weekday AM and PM periods at the four arms: A4042 (north), Caerleon Road, A4042 (south), and Turnpike Road. The total vehicular activity recorded at the survey locations was between 07:00 and 10:00hrs in the AM period and between 15:00 and 18:00hrs in the PM period. The key information from the surveys carried out for the hospital expansion scheme is presented in **Table 2-1**.

Table 2-1: Turnpike Roundabout Traffic Flows (Total Vehicles)

Time	Arm				Total
	A4042 (North)	Caerleon Road	A4042 (South)	Turnpike Road	
07:00-08:00hrs	1642	429	1184	304	3559
08:00-09:00hrs	1705	396	1354	403	3858
09:00-10:00hrs	1197	300	908	282	2687
15:00-16:00hrs	1063	531	1314	405	3313
16:00-17:00hrs	1125	700	1507	351	3683
17:00-18:00hrs	1172	649	1424	285	3530

2.4.2 In order to determine the peak hour for Turnpike Roundabout, the total number of vehicles accessing and egressing have been added to determine the busiest peak hours for the route as a whole. The total traffic flow at the roundabout indicates that the highway network peaks in the vicinity of the site are as follows: AM peak hour occurs at 08:00-09:00hrs and the PM peak hour occurs at 16:00-17:00hrs.

2.5 Walking and Cycling

2.5.1 The site has a number of active travel routes to the north. Large parts of this active travel network is accessible by foot with footpaths alongside the road and also by bicycle with stretches of cycle routes, shared use foot/cycle path. There are limited opportunities for active travel south of the site, which is bordered by a dual-carriageway (Turnpike Road / Croesyceiliog Bypass) and Caerleon Road, both of which have no footway provision.

2.5.2 On Turnpike Road, footways are present on both sides of the carriageway and are a modern compliant standard of 2.0m wide. Turnpike Road provides footway connections to local routes such as LlanYr Avon Way to the west and Woodland Road to the north-west. A pedestrian refuge island is located approximately 100m north of the site access junction with Turnpike Road. There are road signs and road markings to highlight the cycle route. Turnpike Road has a number of dropped kerb crossing points located at places along its length in order to increase the accessibility for active modes.

2.5.3 There are limited opportunities for active travel on the road network to the south of the premises. The A4042 is a dual carriageway with no footway provision and therefore Turnpike roundabout does not accommodate walking via the east arm on Caerleon road or south on the A4042. Pedestrians are required to use the foot/cycle path joining Turnpike Road to Hawarden Garden.

2.5.4 Llan-Yr Avon Way provides footways on both sides of the single carriage and the 20mph speed restriction provide safe use for cyclists and pedestrians. Paths include dropped kerbs at appropriate locations, for ease of safe and direct crossing. Sections of the Llan-Yr Avon Way include cycle road signs highlight the use of cyclist to road users.

2.5.5 **Figure 2-2** shows the existing network of active travel routes which could be used to access the site. Footways (purple) provide the dominant active mode infrastructure with sections of foot and cycle path (orange) and cycle only (green). There are no National Cycle Network (NCN) routes within the immediate vicinity of the site, however NCN 49 and 492 route in a north to south alignment through the centre of Cwmbran and are accessible via existing cycle route 'TORFCR13A', which is identified on Torfaen County Borough Council's (TCBC). Existing Route Map (ERM) as an Active Travel Cycle route. The ERM route runs from the B4236 Caerleon Road (adjacent to Llanfrechfa Grange Hospital) north-west along Turnpike Road, alongside the Police Facility, before heading west towards the centre of Cwmbran via Edlogan Way / Caradoc Road and meeting NCN 492 (Cwmbran to Blaenavon) on the A4051. NCN 49 and 492 route parallel to the north of Cwmbran up to Pontypool, where NCN 492 continues north-west towards Blaenavon and NCN 49 (Newport to Mamhilad) routes north towards Abergavenny. This cycle route can be viewed in **Figure 2-2** identified by the National Cycle Route.

2.5.6 Cwmbran Railway Station is situated approximately 2km north of the site via Turnpike Road. The line is operated by Transport for Wales and serves Newport, Cardiff Central, Manchester Piccadilly via Abergavenny and Hereford. Active travel between the Proposed Development and Cwmbran Railway Station is primarily via walking with sections of shared cycle/ foot path.

Figure 2-2: Existing Active Travel Routes

Planned Walking and Cycling Improvements

2.5.7 In 2023, Torfaen Council secured funding from the Welsh Government (WG) for active travel projects in the Borough. The following improvements schemes are understood to have secured funding for their implementation:

- Oakfield Active Travel Network includes over 400m of new walking and cycling routes around Oakfield recreation ground (located south of the site). This will support the existing shared use walking and cycling path constructed outside Court Farm Road Oakfield to the school.
- Safer Routes in Community project which will conduct assessments on roads and streets outside all Torfaen schools to identify opportunities to improve road safety.
- Additional funding for smaller projects including dropped kerbs, new bike racks and benches

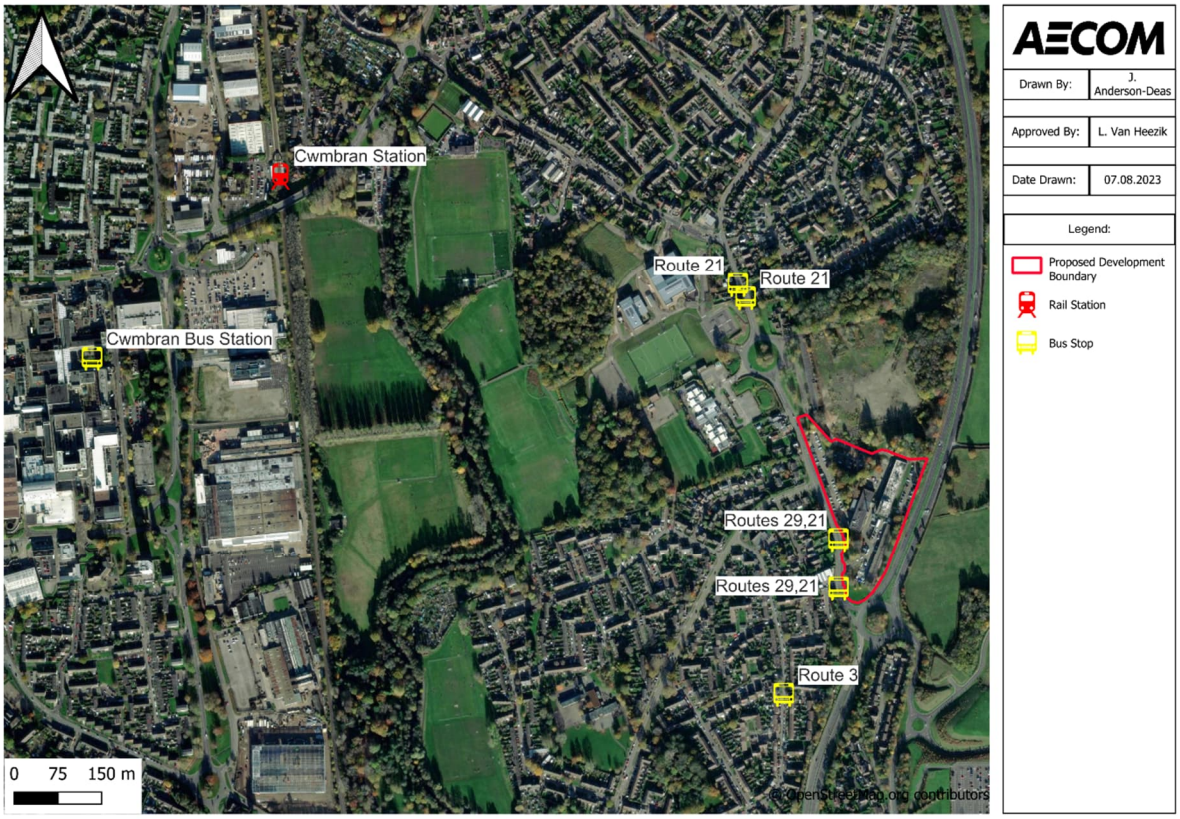
2.5.8 These improvements will enhance the connectivity by active modes of travel between the site and wider Cwmbran area.

2.6 Public Transport

2.6.1 Existing public transport services operating in the vicinity of the site have been identified with reference to current timetable and routeing information.

2.6.2 **Figure 2-3** identifies the nearest bus stops and Cwmbran Bus Station. The stops cover the following routes: 29, 21 and 3. The nearest railway station, Cwmbran Station is located north west of the site.

Figure 2-3: Bus Stops and Rail Station in Proximity to the Site



Bus Services

2.6.3 The IHT's Guidance for Providing for Public Transport in Developments, published in 1999, suggests 400m as the 'acceptable' walking distance to a bus stop. The site has two adjacent bus stops on Turnpike Road which are accessible within approximately 180m of the site. Both bus stops have a shelter and seating The bus stops north and south of the premises, for routes 21 and 3, are beyond the 'acceptable' distance.

2.6.4 **Table 2-2** provides a summary of the bus services which are available from the bus stops on Turnpike Road. Times and frequencies listed are reflective of the latest available timetable, which may be reduced compared to before the COVID-19 pandemic.

Table 2-2: Summary of Local Bus Services (as of August 2023)

Service Number	Route	Days	First Service	Last Service	Approx. frequency
29	Newport to Cwmbran	Mon-Fri	06:46	22:20	30 minutes
		Sat	06:46	22:21	30 minutes
	Cwmbran to Newport	Mon-Fri	06:43	22:22	30 minutes
		Sat	07:17	22:22	30 minutes
21	Cwmbran - Blackwood	Mon-Fri	05:40	22:12	Hourly
		Sat	05:40	22:12	Hourly
	Blackwood - Cwmbran	Mon-Fri	06:41	00:02	Hourly
		Sat	06:41	00:02	Hourly

2.6.5 The bus services operate at a reasonable frequency from stops near to the site, offering services to local destinations including the Grange University Hospital, Railway Station and town centre as well as further afield to Blackwood and Newport.

2.6.6 Access to a wider range of services across the county and to adjacent counties are available from Cwmbran Bus Station, which is situated approximately 2km walk from northwest of the site, and otherwise accessible via both bus services 29 and 21.

Rail Services

2.6.7 The nearest railway station is Cwmbran Station and is identified in **Figure 2-3**. The station is located approximately 1.8km (20 minute) walk northwest of the site.

2.6.8 Facilities provided at Cwmbran and services to/ from this station are summarised in **Table 2-3** and **Table 2-4** respectively.

Table 2-3: Summary of Facilities at Cwmbran Railway Station

Facility[1]	Details
Car Parking	76 Spaces
Disabled Car Parking	2 spaces
Taxi Rank	Yes
Cycle Storage	8 spaces (stands)
Staffing / Ticket Office	Yes
Self Service Ticket Machines	Yes
Step Free Access Coverage	Yes
Refreshment Facilities	Yes

Table 2-4: Summary of Rail Services at Cwmbran Railway Station (as of August 2023)

Direction[2]	Days	First Service	Last Service	Approximate Frequency
To Cardiff	Mon-Fri	06:09	23:49	30 minutes
	Sat	05:59	23:50	30 minutes
	Sun	10:27	23:43	Hourly
From Cardiff	Mon-Fri	04:35	00:30	30 minutes
	Sat	04:35	21:53	30 minutes
	Sun	09:40	23:19	Hourly
To Manchester	Mon-Fri	05:05	22:24	30 minutes
	Sat	04:59	22:17	30 minutes
	Sun	09:03	23:48	Hourly
From Manchester	Mon-Fri	06:09	00:50	30 minutes
	Sat	05:59	23:39	30 minutes
	Sun	10:45	23:43	Hourly
To Holyhead	Mon-Fri	05:42	20:05	2 hours
	Sat	05:44	20:05	2 hours
	Sun	13:53	15:35	Two trains a day

[1] Source: National Rail (August 2023)
[2] Source: Transport for Wales (TfW) Timetables 2023

	Mon-Fri	08:49	21:01	2 hours
From Holyhead	Sat	08:53	21:03	2 hours
	Sun	15:01	21:01	Two trains a day

2.6.9 Overall, there is a good provision of rail services from Cwmbran to key destinations, both locally and regionally. Services begin early in the morning and finish late at night, ensuring a provision to suit a wide range of travel times. Connections at Cardiff Central provide opportunities to board services covering a number of national destinations. Overall, this displays a high availability of rail services to / from the site and surrounding area.

2.7 Accessibility Index

2.7.1 A requirement of the BREEAM process is the consideration and calculation of the Accessibility Index (AI) of a development site. In line with the guidance an assessment of the AI of the site has been undertaken using the AI calculator and associated methodology contained within the BREEAM guidance.

2.7.2 The assessment involves establishing the average number of bus and rail services per hour from compliant transport nodes during a site's operating hours. The guidance specifies an 11-hour operating period (08:00hrs – 19:00hrs) as the default hours of operation for a typical day for 'Other buildings', which is deemed appropriate for this scheme, in the absence of any specific building type for a Police station or facility. Compliant transport nodes are those within 1km of the premises for rail and 650m for bus.

2.7.3 Cwmbran Railway Station is located beyond 1km walking distance from the site, and therefore, is not eligible for inclusion in the calculation. The nearest bus stops are situated approximately 180m from the site on Turnpike Road. For bi-directional services, average frequency has been calculated for one direction only. Additional services from other local stops within 650m walking distance have been considered in the calculation.

2.7.4 The AI calculations and the bus nodes and services considered as part of the assessment are included in **Appendix C**.

2.7.5 The input frequencies of services from compliant nodes results in an **AI of 1.26** which, according to BREEAM guidance, is not sufficient to achieve a credit for this building type.

2.8 Accessibility to Amenities

2.8.1 The proximity of the premises in relation to a specific range of local complementary amenities has been reviewed in line with BREEAM guidance, and in particular Table 7.1 of the guidance contained within topic Tra01. In accordance with Table 7.1, the definition of local amenities includes: 'appropriate food outlets', 'access to cash', and 'access to a recreation or leisure facility for fitness or sports', all to be located within 500m of the site.

2.8.2 There is one specific amenity (Childcare facility or school) referenced in the BREEAM guidance which is within 500m walking distance of the existing Police Facility. This is not sufficient to meet the requirement of BREEAM topic Tra01 which is to demonstrate that 'at least three accessible amenities are present'. There are facilities available outside of the distances prescribed by BREEAM and they are detailed in **Table 2-5** below.

Table 2-5: BREEAM Local Amenities of the Site

Category	Within 500m?	Name / Location	Distance from site
Appropriate food outlet	✗	Co Op	900m
Access to cash	✗	Co Op	900m
Access to an outdoor open space	✗	Outdoor space and park at the HWB at Woodlands	1.1km
Access to a recreation or leisure facility for fitness or sports	✗	Llanyravon Golf Course	1.1km

Publicly available postal facility	✗	Llanyravon Post Office	1.1km
Community facility	✗	Llanyrafon Social Club	1.1km
Over the counter services associated with a pharmacy	✗	Llanyrafon Pharmacy	1.1km
Public Sector GP surgery or general medical centre	✗	Llanyravon Survey	750m
Childcare facility or school	✓	Crownbridge School	450m

2.8.3 The premises is located within approximately 20-minute walk from Cwmbran town centre, which provides a vast range of facilities and amenities.

2.9 Highway Safety

2.9.1 Personal Injury Collision (PIC) data has been obtained from the 'Crashmap' online resource to determine whether there are any locations on the local highway network with existing poor collision records. This initial review using free online database information was used to confirm whether further and more detailed information may be required to be requested from Welsh Government records.

2.9.2 An extract showing the PICs recorded in the study area during the latest available five-year period (2017-2021) is reproduced as **Figure 2-4**. The study area for the purpose of this assessment includes Turnpike Road and its connection to the wider highway network.

Figure 2-4: Personal Injury Collision in the Vicinity of the Site

2.9.3 Over the most recently available five-year period (2017-2021), a total of eight PICs have been identified to have occurred within the vicinity of the site. There is one 'slight' severity recored incident located north on Woodland Road (700m from site). The remaining PICs were recorded to have occurred either on or joining the A4042 located approximately 230m from the site. Three PICs are classified as resulting in 'serious' injury and four classified as resulting in 'slight' injuries. A cluster of six PICs were recorded at the Turnpike Road Roundabout in the five-year period.

2.9.4 The low numbers of PICs recorded to have occurred with the chosen study area over the five year period equates to two incidents per year and suggest there are no existing safety issues in the area local to the site, and the Proposed Development is unlikely to give rise any issues of safety to highway users. The proposed use of the site could mean shorter attendance times of police officers who are called to such incidents and in this way will work to improve any existing highway safety record.

2.9.5 Therefore, no further investigations or analysis is deemed to be required beyond this initial high-level review.

Summary

2.9.6 This chapter of the TA has provided a description of the site location and the existing usage, the local highway network, current safety and traffic conditions and accessibility of the premises to non-car modes of travel.

2.9.7 The Proposed Development is located on Turnpike Road and is approximately 1.2km southeast of Cwmbran Station (crow-fly distance). The site has an existing history of serving Gwent Police Operations, however, the majority of services have recently been relocated to the new Gwent Police Headquarters to the south of Cwmbran.

2.9.8 The local highway network includes Turnpike Road which provides a number of important local functions including access to the Police Operations, Crownbridge School, Discount Pram Centre and access to the residential settlement, Llanyravon. Turnpike Road connects to the A4042 via the Turnpike Roundabout. The A4042 provides a bypass to Cwmbran allowing road users to travel between New Inn and Newport. The A4042 is a dual carriageway runs east of Cwmbran and provides access to key locations via the two roundabouts: Turnpike Roundabout providing access to The Grange University Hospital, residential areas via Crown Road, Industrial Estate via Newport Road and the Edlogan Way Roundabout providing access to Cwmbran via Edlogan Way Sunnydale Garden Centre via Tre-Herbert Road.

2.9.9 Publicly available traffic survey data recoding turning movements at the Turnpike roundabout is provided within the Transport Assessment for the planning application to expand the Emergency Department at The Grange University Hospital. This information has been used to identify the existing traffic conditions at Turnpike Road Roundabout. The survey was undertaken on Thursday 16th June 2022. The traffic survey information confirms that the weekday AM Peak occurs between 08:00-09:00hrs and includes 3,858 vehicles arriving at and departing from the junction and that the PM peak occurs between 16:00-17:00hrs and 3,683 vehicles were recorded using the junction at that time.

2.9.10 There are a number of active travel routes within the surrounding area of the site. They are predominantly walking with paths alongside the roads with a series of cycle lanes and shared use foot / cycle path. The active travel routes are detailed below:

- A shared foot/cycle path between The Grange University Hospital and Turnpike Roundabout. The active travel route starts at Turnpike Road going through Llanyravon settlement accessed via Hawarden Garden. The route goes underpasses the A4042 access via Liswerry Drive to Bath Garden and continues to The Grange Hospital University.
- A cycle route between the Proposed Development and past Cwmbran Station. The ERM route runs from the B4236 Caerleon Road (adjacent to Llanfrechfa Grange Hospital) north-west along Turnpike Road, alongside the Police Facility, before heading west towards the centre of Cwmbran via Edlogan Way / Caradoc Road.

2.9.11 The site is located adjacent to bus stops on Turnpike Road which provide hourly services to Cwmbran and Blackwood and 30 minute services to Newport and Cwmbran.

2.9.12 Cwmbran Station is situated approximately 1.8m walk from the premises and is accessible via Turnpike Road, Woodland Road and Edlogan Way. Equating to 20 minute walk or a 8 minute cycle away. There are regular rail services from Cwmbran to key destinations, both locally and regionally including Cardiff, Manchester and Holyhead.

2.9.13 In 2023, Torfaen Council secured funding from the Welsh Government (WG) for active travel projects in the borough. The following improvements schemes are understood to have secured funding for their implementation:

- Oakfield Active Travel Network includes over 400m of new walking and cycling routes around Oakfield recreation ground (located south of the site). This will support the existing shared use walking and cycling path constructed outside Court Farm Road Oakfield to the school.
- Safer Routes in Community project which will conduct assessments on roads and streets outside all Torfaen schools to identify opportunities to improve road safety.
- Additional funding for smaller projects including dropped kerbs, new bike racks and benches

2.9.14 These improvements will enhance the connectivity by active modes of travel between the site and wider Cwmbran area.

2.9.15 Existing highway safety records have been considered. It was established that during the latest available five year period from 2017-2021, a total of eight PICs have been identified to have occurred within the vicinity of the premises. The low number of PICs over the five year period, and the lack of evidence to suggest a correlation would confirm that there are no existing safety issues in the area and the Proposed Development is unlikely to give rise any issues of safety to highway users. It was also considered important to highlight that the proposed use of the site could mean shorter attendance times of Police officers who are called to such incidents and in this way will work to improve any existing highway safety record.

3. Development Proposals

3.1 Introduction

3.1.1 This section of the TA outlines the development proposals, including the method of access for all mode types, as well as strategy for internal movement, deliveries and servicing.

3.2 Overview of Proposals

3.2.1 The development proposals include the demolition of the existing buildings on the premises and the construction of a new Operational Facility for Gwent Police. This will include three replacement buildings comprising a Police Hub with custody suites, Specialist Training Facility and Vehicle Workshop. The purpose of the Proposed Development is to consolidate services across the constabulary to improve operational efficiencies. This premises was identified as a suitable location for the centralisation of services due to the easy access to the A4042 which is an important highway connection in the region.

3.2.2 The proposed facility is designed with an optimum capacity of cells (50 holding cell capacity) to ensure that regional efficiency and handling of detainees is achieved. It is envisaged that the proposed facility will end the need to use custody facilities at Newport and Ystrad Mynach. It will also reduce the current requirements in terms of detainee transportation and the associated interview trips. The facility is within short distance of the courts. Therefore, by designating the proposed site as the main facility for the area, this will significantly reduce travel times for the transportation of custody detainees, thereby reducing vehicle kilometres over the wider network. The relocation of existing facilities within constabulary will also serve to remove Police vehicles from the Town Centre network and the surrounding area.

3.2.3 The Vehicle Workshop will have capacity for approximately 15 vehicles at any one time. The operating times of the workshop is expected to be within the typical working day.

3.2.4 The Specialist Training Facility will have the capacity for four classes of 20 persons and include classrooms, a gym, canteen and briefing area. It is anticipated that when large scale police briefings are required for Gwent Police, these will be held at the Specialist Training Facility.

3.2.5 A pedestrian bridge will connect the Police Hub and Specialist Training Facility to allow for easy access between the two buildings.

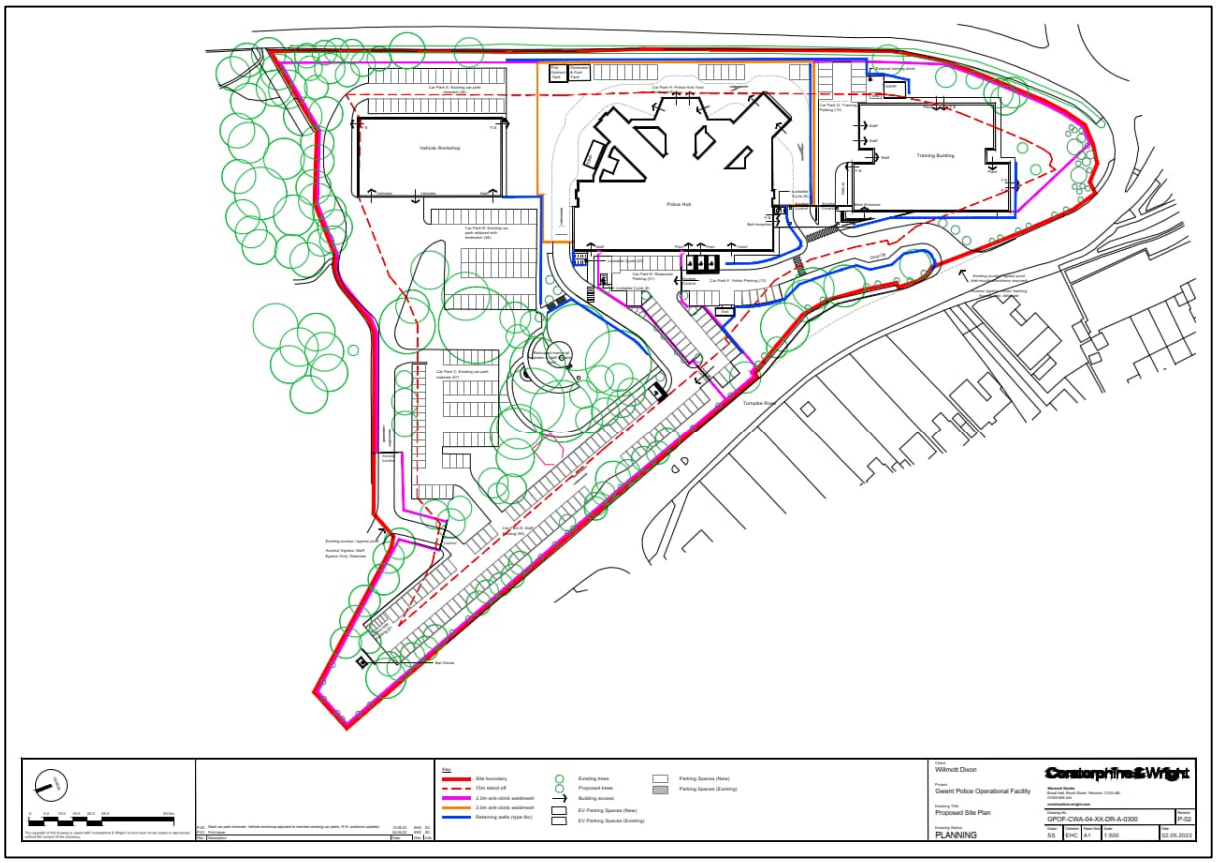
3.2.6 The proposed facility will employ a total of 348 staff. The Police Hub will operate on a 24-hour basis. Information has been provided by Gwent Police in regards to daily shift patterns by department / role and number of staff per shift. This has enabled the preparation of more refined forecasts for staff arrival / departure profiles and associated trip generation forecasts, this is discussed at **Chapter 5**. This analysis forecasts that a maximum of 251 staff will be on site at any one time (during shift changeovers).

3.2.7 The proposed facility will be a secured site with security fencing around the perimeter and throughout the site. The development site will not be open to the public for Police services, and all visitors to the site will attend via invitation only.

3.2.8 The development will make use of an existing primary access off Turnpike Road, and a second vehicle access off the Crownbridge School roundabout. The remainder of this chapter will provide further detail regarding the access and movement strategy for the site.

3.2.9 The proposed Site Layout Plan in presented in **Figure 3-1**. A larger version of this Plan is available in **Appendix D.**

Figure 3-1: Proposed Site Layout



3.3 Access Strategy

3.3.1 The proposed redevelopment of the site will retain the existing vehicular access locations, both towards the north (connection to Crownbridge School Roundabout) and to the south of the premises from Turnpike Road. As part of the proposals, there is likely to be a requirement for some local improvements, such as bell-mouth alterations at the access junction onto Turnpike Road. Both access locations will continue to operate as two-way, with each access utilised separately by staff / visitors / custody vehicles, dependant on their function within the site. The intended arrival and departure regime for the key user groups is discussed in more detail below.

3.3.2 Staff will enter and exit the site via the access to the north of the site which connects to the Crownbridge School Roundabout, via an unnamed road. This includes staff that are visiting the site for the Specialist Training Facility.

3.3.3 A one-way system is proposed for the custody vehicles where they will enter from the Turnpike Road access, before circulating the site to the rear of the Police Hub building and exiting through the staff car park to the northern access connection to Crownbridge School Roundabout.

3.3.4 Response vehicles will enter/exit the site via the main access on Turnpike Road. Visitors will enter and exit the premises via the Turnpike Road access.

3.3.5 Turnpike Road, which provides access to the site from the south, is subject to a speed limit of 30mph. Therefore, the appropriate level of vehicular visibility splays that will need to be achieved are 2.4m x 43m at the access junction, commensurate with the nationally applicable standards set out in *Manual for Streets* (MfS) (2007). Although the proposals are unlikely to result in an intensification of use at either of the two access locations into the site, there is likely to be the requirement for bell-mouth alterations at the access junction onto Turnpike Road. The northern access location, connecting to Crownbridge School Roundabout will remain as existing and therefore has not been included in the vehicular visibility assessment. As shown at **Appendix E**, this level of emerging visibility is achievable in both directions and on Turnpike Road.

3.3.6 A suite of Swept Path Analyses (SPA) has been undertaken on the masterplan to demonstrate that the proposed arrangements are suitable, safe and appropriate for accommodating the range of vehicle types that are anticipated to serve the development. The following vehicle types have been subject to SPA:

- 11.3m Phoenix Duo Refuse Vehicle;
- 6.2m Small Skip Lorry;
- 7.3m Panel Van (Custody Vehicle);
- 8.6m Fire Appliance; and
- 5.1m 'Large Car'.

3.3.7 The SPA plans included within this report set out the designed movement requirements for each type of vehicle. In all of the analyses it is confirmed that the vehicles are demonstrated to be able to access and circulate through the development in a safe manner. SPA drawings for all assessed vehicle types are included within **Appendix E.**

3.4 Parking

3.4.1 On-site parking will be provided for staff, visitors to the facility, and for operational vehicles. The following parking composition and allocation is proposed:

- **Staff:** 193 car parking spaces;
- **Visitor:** 13 car parking spaces (equates to around 4% of the total parking provision);
- **Operational:** 93 car parking spaces (16 car spaces for the Police Hub, 36 car spaces for the Vehicle Workshop, 10 car spaces for Specialist Training Facility and 31 car spaces for response vehicles) ;
- **Accessible parking:** four spaces;
- **Motorcycle:** six motorcycle spaces; and
- **Cycle:** 36 cycle spaces.
- .

3.4.2 Torfaen County Borough Council (TCBC) adopted parking standards and Supplementary Planning Guidance (SPG) are based upon the CCS Wales Parking Standards (2014). There are no parking standards provided within this SPG for this type of development land use or "sui generis" developments. Therefore, in the case of this development the parking provision has been developed based on the existing experience of operations at this site, the existing parking provision and the proposed operational needs.

3.4.3 There are currently 307 car parking spaces provided on the site. The level of staff car parking is not proposed to increase to from the historic provision on the site. The total proposed car parking provision for the application site is 299 spaces.

3.4.4 In terms of operational parking provision, this includes response vehicles and custody vehicles, Gwent Police has confirmed that the facility will require 93 parking spaces for the Proposed Development to function as intended. This requirement has been derived based on experience to meet the specific operational demands of the proposed services.

3.4.5 The Proposed Development will not be open for the public to report crime, or seek police services, this will be operated as a secure site. All visitors to the premises will attend via invitation and it is therefore confirmed that visitor parking can be controlled and managed.

3.4.6 TCBC parking standards state that 5% of total car parking capacity should be provided as blue badge parking. It is proposed that four accessible parking spaces will be provided on-site. Three of the accessible spaces will be provided in the visitor parking near the entrance to the Police Hub. An accessible parking space will also be provided in the staff parking area by the access gate. The blue badge provision will be promoted for visitor use, with internal operational needs setting out the other parking requirements.

3.4.7 EV charging infrastructure has been provided at a level of 10% of parking spaces for each user group excluding the operational vehicles (i.e., provided for general staff and visitors). This allocation aligns with *Planning Policy Wales* (PPW) and emerging parking standards.

3.4.8 In addition to the parking provision outline above, one drop-off space will be provided on site for use when staff or visitors to the site arrive by taxi or driven by others.

Cycle Parking

3.4.9 The Proposed Development will include the provision of 36 cycle parking spaces. The cycle parking will be provided as three lockable cycle areas near the Police Hub.

3.4.10 There are no cycle parking standards provided within this SPG for this type of development land use or "sui generis" developments. The closest land use that has cycle parking standards is an office development. An office development will have a higher proportion of staff per m^2 than the Proposed Development. The cycle parking standards for an office land use are the following:

- Long Stay: 1 stand per 200m^2
- Short Stay: 1 stand per 1,000m^2

3.4.11 Furthermore, BREEAM Topic Tra02 covers the provision of sustainable transport measures to encourage the uptake of non-car travel to / from the development. In terms of cycling, this includes:

- Option 7: 'Install compliant cycle storage spaces to meet the minimum levels', i.e. one space per 10 members of staff (for 'Other' building types).
- Option 8: (Achieve Option 7 and) 'Provide at least two compliant cyclists' facilities for the building users', to include showers, changing facilities, lockers, drying spaces.

3.4.12 Based on a maximum of 348 staff, 1 space per 10 staff equates to 35 cycle parking spaces for the Proposed Development. As stated above, the development proposals include the provision of 36 cycle parking spaces and therefore the provision meets the criteria for Option 7. Furthermore, the staff will be shift-based and therefore, all 348 staff will not be present on site at on-time resulting in a higher provision of cycle parking per staff.

Motorcycle Parking

3.4.13 TCBC parking standards state that 5% of total car parking capacity should be provided as motorcycle, therefore based on the number of staff and visitor parking spaces proposed the Proposed Development should provide 11 motorcycle parking spaces. The Proposed Development will include the provision of six motorcycle parking spaces. It is not confirmed whether any motorcycle parking is currently provided on the existing premises. This level of provision is considered to be an improvement over that which presently exists on the site. The motorcycle parking will be located in the north corner of the staff car park with the recommended bay size of 2.8m x 1.3m.

Total Parking Summary

3.4.14 In summary the total parking provision on site will comprise of the following:

- 299 car parking spaces, including 22 EV parking spaces and four accessible spaces;
- 36 cycle parking spaces;
- Six motorcycle spaces; and
- One drop off bay.

3.5 Servicing

3.5.1 The servicing and operational needs of the Proposed Development have been considered and designed appropriately to suit the intended purposes. Refuse collections will occur within the site, via a servicing layby provided adjacent to the Training Building. Vehicular access to the layby is likely to comprise forward entry into the servicing area before a short reverse manoeuvre into the provided layby. This is typical in refuse arrangements nationwide and within accepted maximum attendance and movements distances. The refuse vehicle would exit back onto Turnpike Road in a forward gear.

3.5.2 There may be the occasional requirement for a skip handling HGV to attend the site for skip drop-off / collection. An indicative location for a skip is shown to the rear of the Training Building, adjacent to the parking area. SPA has been conducted showing a six metre skip handler entering the parking area, before completing a turning manoeuvre towards the skip attendance space. The manoeuvre would require a minimum of three parking spaces to be vacant in order to avoid potential vehicle conflicts. The nature and likely infrequency of the skip attendance suggests this can be managed on-site on an ad-hoc basis.

3.5.3 Each of the servicing-related movements discussed above have been demonstrated in the SPA provided in **Appendix E**.

4. Planning Policy Review

4.1 Introduction

4.1.1 This section of the TA provides a review of existing planning and transport policies at a national, regional and local level considered relevant to the Proposed Development.

4.2 National Policy

Planning Policy Wales

4.2.1 Edition 11 of PPW was published in February 2021 and sets out the land use planning policies of the WG. It is supported by a number of Technical Advice Notes (TANs), which provide detailed planning advice on subjects contained within Planning Policy Wales (PPW). TAN 18: Transport is considered of particular relevance to the Proposed Development and is included in this policy review. An overarching theme within PPW is the commitment of the WG to sustainability.

4.2.2 PPW is plan-led, with up-to-date LDPs forming a fundamental part of the system. PPW states that planning applications *"must be determined in accordance with the adopted plan unless material considerations indicate otherwise."*

4.2.3 PPW outlines the vision for development of a more effective and efficient transport system, the promotion of more sustainable and healthy forms of travel, as well as minimising the need to travel. PPW indicates that this will be achieved through integration:

- *"Within and between different types of transport;*
- *Between transport measures and land use planning;*
- *Between transport measures and policies to protect and improve the environment; and*
- *Between transport measures and policies for education, health, social inclusion and wealth creation."*

4.2.4 The WG outlines a support for a transport hierarchy in relation to the accessibility of new development that prioritises walking and cycling in the first instance, followed by public transport, ultra-low emissions vehicles and finally other private motor vehicles.

4.2.5 Paragraph 4.1.11 states:

"Development proposals must seek to maximise accessibility by walking, cycling and public transport, by prioritising the provision of appropriate on-site infrastructure and, where necessary, mitigating transport impacts through the provision of off-site measures, such as the development of active travel routes, bus priority infrastructure and financial support for public transport services."

4.2.6 Paragraph 4.1.40 relates to the provision of facilities for EVs:

"To encourage the use of Ultra Low Emission Vehicles (ULEVs), the planning system should encourage and support the provision of ULEV charging points as part of new development."

4.2.7 Paragraph 4.1.49 states that car parking provision has a major influence on both mode choice and development patterns.

4.2.8 Paragraphs 4.1.55 to 4.1.56 identify the requirements for development proposals to be accompanied by an appropriate level of transport assessment. It directs professionals to the TAN 18 for guidance on the preparation and content of assessments.

Technical Advice Note 18: Transport

4.2.9 TAN 18 was published in March 2007. It describes how to integrate land use and transport planning and explains how transport impacts should be assessed and mitigated. It supports, and should be read in conjunction with, PPW.

4.2.10 The integration of land use and transport planning forms part of an overall sustainable development approach by the WG towards strategy and policy objectives. This is predominantly through maximising the accessibility of developments by sustainable modes of transport. This also includes reducing the need to travel and encouraging multi-purpose trips. Accessibility is defined in TAN 18 as "the relative ability to take up services, markets or facilities."

4.2.11 Paragraph 4.6 states that parking standards for new developments should be determined on an evidence basis which includes accessibility to other modes of transport.

4.2.12 Section 5 requires all new development to be designed in a way that is inclusive for all. The design of the development also plays an important role in providing genuine alternatives to car travel.

4.2.13 Section 6 highlights the ability for walking and cycling to replace shorter car journeys, as well as the ways in which developments can encourage this. This includes the creation and protection of safe and legible pedestrian and cycle routes along key desire lines, and provision of cycle parking and facilities.

4.2.14 Section 7 considers the role that public transport can play in offering an alternative to car travel, giving emphasis to the provision of new services and facilities, as well as facilitating interchange, as methods of encouraging uptake.

4.2.15 Paragraph 9.2 states that "developers should be required by local authorities to submit transport assessments to accompany planning applications for developments that are likely to result in significant trip generation." This TA will demonstrate that the development proposals are suitable in terms of travel demand and impact.

4.2.16 TAN 18 requires a Transport Implementation Strategy to be included within a TA. This should seek to:

- "Identify what policy objectives and requirements are set by the development plan in terms of access to the development and movements in and around the site;
- Identify what access arrangements are required for a successful development (meeting the needs of the developer, end user, addressing impacts on neighbours and existing movements surrounding the site); and
- Specify the package of physical, management and promotional measures needed to accommodate the requirements identified above, such as physical infrastructure, the design and location of buildings, parking management, financial incentives and dedicated travel plan co-ordinators."

4.2.17 The TIS is set out in **Section 7**.

The Wales Transport Strategy 2021

4.2.18 The Wales Transport Strategy 2021 (WTS) was published in March 2021 and provides a long-term vision for transport over the next 20 years. The vision of the WTS is "an accessible, sustainable and efficient transport system." In order to deliver its vision, the WTS sets out three priorities:

- Priority 1 – Bring services to people in order to reduce the need to travel;
- Priority 2 – Allows people and goods to move easily from door to door by accessible, sustainable transport; and
- Priority 3 – Encourage people to make the change to more sustainable transport.

National Transport Finance Plan

4.2.19 The National Transport Finance Plan (NTFP) provides the timescales for financing and delivery of schemes in Wales. The NTFP is not a policy document and nor does it prioritise schemes to be taken forward. It was published in 2015 and an update was since published in 2018.

4.2.20 This has identified that scheme reference R27h includes a "Range of improvements including major infrastructure improvements to reduce congestion and increase capacity at junctions" on the M4 between Junctions 35 and 49 from 2019/20 onwards.

Active Travel (Wales) 2013

4.2.21 The Active Travel (Wales) Act became law in Wales in November 2013. The Act makes it a legal requirement for local authorities in Wales to map and plan for suitable routes for active travel, and to build and improve their infrastructure for walking and cycling every year. It also requires both the WG and local authorities to promote walking and cycling as a mode of transport.

4.2.22 The Act is accompanied by a statutory design guidance document, published in December 2014, which provides advice on the planning, design, construction and maintenance of active travel networks and infrastructure, and is to be used at all stages of the process. Reference has been made to this guidance in the planning and design of the Proposed Development.

Wellbeing of Future Generations (Wales) Act 2015

4.2.23 The Wellbeing of Future Generations (Wales) Act 2015 has resulted in the WG outlining seven goals in a 'wellbeing statement' (published in 2017) that contribute to sustainable development and details the aims to improve economic, social, environmental and cultural wellbeing of Wales for future generations. The Act places a duty on Local Authorities to set wellbeing objectives and contribute to achieving the seven well-being goals, which are:

- A prosperous Wales;
- A resilient Wales;
- A healthier Wales;
- A more equal Wales;
- A Wales of cohesive communities;
- A Wales of vibrant culture and thriving Welsh language; and
- A globally responsible Wales.

4.2.24 The seven goals form the basis for twelve objectives, also detailed in the wellbeing statement. Several of these are directly relevant to this proposed scheme:

- Drive sustainable growth and combat climate change;
- Promote good health and well-being for everyone;
- Build healthier communities and better environments; and
- Deliver modern and connected infrastructure.

4.3 Regional Policy

South East Wales Valley Local Transport Plan 2015-2030

4.3.1 The South East Wales Valley Local Transport Plan was jointly produced by Blaenau Gwent, Caerphilly, Merthyr Tydfil, Rhondda Cynon Taf and Torfaen County Borough Councils and sets out the priorities for transport schemes between 2015 and 2030. The LTP reviews problems in The South East Regional Transport Plan (RTP) and details opportunities. The South East Wales Valley LTP provides short (2020) and longer (2030) term programmes of interventions to achieve its vision:

"A modern, accessible, integrated and sustainable transport system for the SE Wales Valleys and beyond which increases opportunity, promotes prosperity for all and protects the environment; where walking, cycling, public transport and sustainable freight provide real travel alternatives."

4.3.2 The LTP vision is supported by a series of prioritises, which are:

- Develop the economy, through improving connectivity for business and freight, making transport more effective and efficient, providing access to employment, education, shopping and leisure, and improving transport integration;
- Promote social inclusion and equality, by providing a transport system that is safe, accessible, and affordable to all sections of the community; and
- Protect the environment, by minimising transport emissions and consumption of resources and energy, by promoting walking, cycling, quality public transport, modal shift and minimising demand on the transport system.

4.4 Local Policy

Torfaen County Borough Council Local Development Plan 2013-2021

4.4.1 Torfaen County Borough Council Local Development Plan (LDP) was adopted in December 2013 and overs the period up to 2021. It is still the LDP in place at the time of writing. The plan provides a framework for local decision making to create sustainable growth in the community. The vision of the plan is:

"By 2021, through collaborative working, the development strategy for the Torfaen Local Development Plan will deliver planned, sustainable growth reflecting the specific role and function of settlements. It will provide a distinctive, vibrant and prosperous area where people have the skills, knowledge and opportunities to achieve a better quality of life in safe, healthy and thriving communities with accessible local facilities".

4.4.2 In order to help achieve this vision, The LDP aims to provide a 'Network of Integrated Communities' with the key settlements functioning as service hubs for surrounding settlements. The central hubs are Blaenavon, Pontypool and Cwmbran and will provide services for the surrounding areas.

4.4.3 Strategic Policy S2 (Transportation Planning Principles) states that proposed development should contribute to the regeneration of existing communities and meet sustainable transportation and infrastructure priorities whilst reducing the reliance on the private vehicle.

Replacement Torfaen Local Development Plan 2022-2037

4.4.4 The emerging Torfaen County Borough Council replacement LDP is to provide framework on developments that take place until to 2037. The LDP will guide and control future developments and provide the basis of how planning applications are determined. A Delivery Agreement for the Replacement Torfaen Local Development was approved following Council on the 18th July 2023. The Delivery Agreement sets out LDPs production including a timetable and sets out how stakeholders and community can contribute to the plan.

4.4.5 The Delivery Agreement for the Replacement Torfaen Local Development (RLDP) timetable contains an Key Stage Timetable. The table starts with the review of the LDP in December 2017 and ends with the adoption of the RLDP in October 2026 (followed by an annual monitoring report in October 2028.

4.4.6 The community involvement scheme will encourage proactive engagement with the community in the development of the RLDP.

Torfaen County Borough Council Parking Standards Supplementary Planning Guidance

4.4.7 Torfaen County Borough Council parking standards are presented in the Supplementary Planning Guidance (SPG) and are based upon the CSS Wales parking Standards (2014). The SPG sets out the councils parking standards and explains the planning policy for parking requirements for new developments or for changes of use. The parking standards seek to promote and ensure transparent and consistent approaches to the provision of all typical forms of parking. In addition, it helps to inform developers and designers what is expected of them in terms of sustainability considerations and travel planning.

4.4.8 There are no car or cycle parking standards provided for the specific proposed land use, or generally for "sui generis" developments. However, for all new developments the SPG states that 5% of car parking provision should be provided for motorcycle parking and for new employment premises 5% of car parking should be blue badge parking.

Torfaen Adopted Local Development Plan (to 2021): Sustainable Locations Supplementary Planning Guidance

4.4.9 The Supplementary Planning Guidance (SPG) was published on 13th June 2023. The SPG was produced to support the Torfaen Local Plan and was developed using placemaking guidance by the Design Commission for Wales and guidance from the Chartered Institute for Highways and Transportation (CIHT). The SPG sets out Torfaen County Borough Council approach to assessing whether a proposed development is in a sustainable location and if a development can contribute to the creation of a sustainable community. The SPG identifies sustainability matters relevant to the geographical location of the proposed development site.

4.4.10 The SPG is to encourage sustainable location and prevent creating car dependent developments. Any future development site should prioritise opportunities to capitalise on locations with existing public/ active transport network.

4.4.11 The SPG applies to all new residential developments within the Torfaen urban boundary. The SPG does not apply to 'replacement dwellings or extension to existing dwellings' and so while the guidance provide valuable information on creating a sustainable location is not a requirement.

Summary

4.4.12 This section of the report has identified and discussed the planning policies at a national, regional and local level considered relevant to the Proposed Development.

4.4.13 The development proposals are considered to align with the policies in PPW, TAN 18, the LDP, Draft LDP and LTP. They support the focus on reducing the need to travel. The aim of the Proposed Development is to consolidate services that are spread out across the constabulary in order to improve efficiencies in essential operations. This will result in vehicle kilometre savings for operational vehicles across the region and reduction in the number of vehicles and distance travelled. The site is also located with convenient access to a rail station, bus stops, walking and cycling facilities.

4.4.14 The Proposed Development is part of the essential type of services that are required to be in place and which do not usually benefit from guidance in terms of traffic generation and parking standards. The drive for this redevelopment is operational efficiency which can be translated in new more modern facilities we are accessible, and which will result in savings in terms of operational movements and movements of personnel.

4.4.15 The proposed access arrangements will be designed with reference to appropriate standards and will integrate with off-site provision to facilitate take up of sustainable modes and will ensure that safe and suitable access can be achieved for all people. In summary, the proposals are considered to be consistent with both overarching national, regional and local planning and transport policy and promote the core requirements on well designed and sustainable development.

5. Trip Generation and Distribution

5.1 Introduction

5.1.1 This chapter sets out the forecast trip generation that could result through the implementation of the development proposals. The forecasts have been developed on a first principles basis through direct input and information provided by the project leads from Gwent Police. This chapter includes forecasts for both staff commuting and operational requirements.

5.1.2 This trip generation forecast will be considered against the background that includes a site that has already operated for a number of years as a Gwent Police Headquarters. The changes that could be experienced in traffic terms have been calculated in order to provide a comparison to the 'consented' or accepted position.

5.2 Existing Trip Generation

5.2.1 The existing site accommodates up to approximately 480 staff between the three buildings. The maximum occupancy or number of staff on site occurs between 08:00hrs and 17:00hrs.

5.2.2 When fully operational, the following shift patterns for staff were in place at the Gwent Police Headquarters:

- Day Shift: 07:00 – 17:00hrs
- Afternoon Shift: 15:00 – 22:00hrs; and
- Night Shift: 22:00 – 07:00hrs

5.3 Proposed Development Trip Generation

Staff Forecasts

5.3.1 As, set out at the outset of this chapter, he forecast trip generation of the development proposals has been derived using a first principles methodology. This is extremely robust given that the end-user of the site is known, and therefore the approach benefits from specific operational information regarding staffing and shift patterns. The specific details of the proposals are considered to be a matter of police security, therefore not all details of the layout and operating conditions can be shared. On close review, it is considered that the information contained with the trip generation section is well informed and sufficient to provide the background and justification.

Staff Population and Shift Patterns

5.3.2 A total of 348 staff will be employed at the site, with the facility operating on a 24-hour basis. Gwent Police has supplied information with regards to daily shift patterns by department / role and number of staff per shift. Overall, the Proposed Development is anticipated to result in a reduction of 132 staff based on the site, when compared to the existing and consented use.

5.3.3 The information supplied by Gwent Police and how this has been used to prepare forecasts is detailed at **Appendix F**. For data protection reasons, each department / role has been anonymised and labelled as 'Team 1', 'Team 2', etc. An arrival / departure profile has then been prepared for each team for each day, with staff assumed to arrive on site in the hour preceding and depart in the hour following their shift. These department profiles have then been combined to provide an arrival / departure profile for all staff at the proposed facility. The staff population has been calculated from a sum of the arrivals and departures for each hour, with staff assumed to arrive on site in the hour preceding and depart in the hour following their shift.

5.3.4 It is anticipated that the Proposed Development will accommodate a maximum of 348 staff within the three buildings. The projected maximum number of staff for the Proposed Development per department/service is set out in **Table 5-1**.

Table 5-1: Projected Maximum Staff for Proposed Development

Team	Projected Number of Staff
Team 1	76
Team 2	44
Team 3	187
Team 4	28
Team 5	13
Team 6	76
Total	**348**

5.3.5 The resulting arrival / departure profile for key time periods and permanent staff population at any one time is summarised in **Table 5-2**.

Table 5-2: Permanent Staff Arrival / Departure Profile and Population – Summary

Time Period		Staff Arrival / Departure Profile			Peak Population
		Arrivals	Departures	Two-Way	
AM Peak Period	07:00-08:00	49	15	64	
	08:00-09:00	52	0	52	
	09:00-10:00	13	0	13	
PM Peak Period	16:00-17:00	13	51	64	251
	17:00-18:00	0	65	65	
	18:00-19:00	15	65	80	
24-Hour Period		279	279	558	

Note: Summation errors are due to rounding.

5.3.6 **Table 5-2** shows that there is forecast to be a maximum of 251 members of staff on site at any one time (during shift changeover). The daily arrivals and departures are expected to be in the order of 279 people movements into and out of the site.

5.3.7 It is forecast that, as a worst scenario, there could be 52 staff arrivals per hour within the AM peak period, and 65 departures per hour within the PM peak period.

5.3.8 In addition, the Specialist Training Facility is anticipated to have approximately 60 staff (externally based) per day visiting the site to undertake training. The training sessions will occur between 08:00hrs and 16:00hrs.

Staff Vehicle Trip Generation

5.3.9 In order to calculate the forecast vehicle trip generation of the proposed development, a mode share profile for staff trips has been derived from 2011 Census Journey to Work data for the 'Torfaen 008' Middle Super Output Area (MSOA). This is summarised in **Table 5-3**.

Table 5-3: Site Based Staff Mode Share

Mode	Proportion
Car driver	84%
Car passenger	5%
Public transport	3%
Motorcycle, scooter or moped	1%
Bicycle	1%
On foot	6%
Other method of travel to work	1%
Total	**100%**

5.3.10 These mode shares have been applied to the staff arrival and departure profile to determine the likely resultant multi-modal trip generation for the proposed development work force. The key areas of concern for the LHA will be the potential impact of any proposals, either negative or positive, upon the local highway network, and in particular during the highway network weekday AM and PM peak hours. These peak hours have already been determined for the immediate local area through interrogation of traffic survey data, this is set out in Chapter 2 of this report. The resultant trip generation in the identified network weekday AM and PM peak hours is presented in **Table 5-4** below.

Table 5-4: Forecast Site Based Staff Multi-Modal Trip Generation

	AM Peak Hour (08:00-09:00)			PM Peak Hour (16:00-17:00)		
Mode	**Arrivals**	**Departures**	**Two-Way**	**Arrivals**	**Departures**	**Two-Way**
Car driver	44	0	44	11	43	54
Car passenger	3	0	3	1	2	3
Public transport	1	0	1	0	1	2
Motorcycle, scooter or moped	0	0	0	0	0	0
Bicycle	0	0	0	0	0	1
On foot	3	0	3	1	3	4
Other method of travel to work	0	0	0	0	0	0
Total	**52**	**0**	**52**	**13**	**51**	**64**

Note: Summation errors are due to rounding.

5.3.11 Staff who are attending the new facility to undertake training, which is expected to be delivered with logistical efficiencies serving district areas together, will be encouraged to car share where possible to reduce the number of vehicles arriving and departing the site. However, to ensure a robust assessment within this report, it has been assumed that all of the staff visiting the site to undertake training will arrive and depart by car. The Specialist Training Facility is anticipated to have approximately 60 staff (externally based) per day visiting the site to undertake training. The training sessions will occur between 08:00hrs and 16:00hrs.

5.3.12 The total staff multi-modal trip generation that is forecast to occur during the identified network weekday AM and PM peak hours is presented in **Table 5-5** below. This includes the projected number of staff that will visit the Proposed Development for training.

Table 5-5: Total Staff Multi-Modal Trip Generation

	AM Peak Hour (08:00-09:00)			PM Peak Hour (16:00-17:00)		
Mode	**Arrivals**	**Departures**	**Two-Way**	**Arrivals**	**Departures**	**Two-Way**
Car driver	44	0	44	11	103	114
Car passenger	3	0	3	1	2	3
Public transport	1	0	1	0	1	2
Motorcycle, scooter or moped	0	0	0	0	0	0
Bicycle	0	0	0	0	0	1
On foot	3	0	3	1	3	4
Other method of travel to work	0	0	0	0	0	0
Total	**52**	**0**	**52**	**13**	**111**	**124**

Note: Summation errors are due to rounding.

5.4 Operational Traffic Forecasts

5.4.1 Through internal demand and operational forecasts, it has been determined by Gwent Police that there will be on average approximately 26 Detainees brought to the site per day. With the 50 cell capacity allowing for change over processing, larger scale incidents and a rotating wing kept clear and on standby for emergency procedures.

5.4.2 Based on the above, there would be two trips associated with each Detainee to account for the formal booking in and an officer arriving to interview the Detainee. This would result in an average of 52 trips per day (102 two way movements) associated with Detainees. Due to the nature, need or occurrence of arrests and these trips, it cannot be forecast how many trips are likely to occur during the peak hours. The arrival and departure profile for Detainees will vary on a day-to-day basis. For the purposes of this assessment a flat profile has been assumed for Detainee related trips. This results in approximately two arrival and two departure trips per hour across the day associated with Detainees.

5.4.3 A fleet of operational vehicles / bicycles will be located at the Proposed Development for the use of different departments / teams. The operational vehicles include blue light vehicles and also unmarked vehicles. The breakdown of operational vehicles / bicycles per team is set out below.

Table 5-6: Summary of Projected Operational Vehicles

Team	Projected Number of Operational Vehicles	Operational Bicycles
Team 1	1	0
Team 2	3	0
Team 3	25	8
Team 4	14	0
Team 5	4	0
Total	**47**	**8**

5.4.4 There are anticipated to be 47 operational vehicles on-site to meet the needs of the Proposed Development, this includes blue light vehicles. Due to the nature of the operational vehicles and blue light vehicles being called when required, the number of vehicles arriving and departing from the site per hour cannot be forecast.

5.5 Visitor Forecasts

5.5.1 Other trips will include those associated with visitors. The number of these trips will vary on a day-to-day basis and is therefore difficult to forecast. Based on visitor analysis provided by Gwent Police, it is anticipated that there will be approximately four visitors per day to the custody unit and a further eight visitors to operational policing. For the purposes of this assessment it has been assumed that these visitor trips will be equally spread out between 07:00 and 19:00hrs, this results in one arrival and one departure trip per hour.

5.6 Total Vehicle Trip Generation

5.6.1 The forecasts which have been calculated and presented are for traffic that already exists elsewhere within the local network. Through review, it has been determined by Gwent Police that this existing traffic currently travels inefficiently within the local and wider area. This has seen a proposed investment scheme allocated to the subject site to develop new facilities to provide county wide operational efficiencies and to work towards achieving Police Authority carbon and pollution reduction. Should the Proposed Development be constructed, it will result in the vehicle kilometre savings of operational and staff vehicle travel that will benefit the wider network.

5.6.2 The operational forecasts presented within this report are based on existing facilities and also consider a limited section of the wider highway network, for traffic impact consideration; in reality, a wider area and catchment is likely to experience a reduction in vehicular impact due to the efficiencies targeted to be achieved from the proposed facility location. The development site is also a historic base for Police Headquarters and operations with the principles of this specific type of employment traffic already accepted. It has been determined that the proposals will also result in a lower number of staff being permanently based on the site to that which has been accommodated in the past.

5.6.3 A summary of the total vehicular trip generation, in the network weekday AM and PM peak periods, for the Proposed Development is set out in **Table 5-7**.

Table 5-7: Summary of Total Proposed Development Vehicular Trip Generation

Time Period		Staff Arrival / Departure Profile		
		Arrivals	Departures	Two-Way
AM Peak Period	07:00-08:00	104	16	120
	08:00-09:00	47	3	51
	09:00-10:00	14	3	17
PM Peak Period	16:00-17:00	14	106	120
	17:00-18:00	3	58	61
	18:00-19:00	16	58	74
24-Hour Period		360	360	721

Note: Summation errors are due to rounding.

5.7 Trip Distribution

Staff Vehicles

Site Based Staff

5.7.1 In order to provide a quantitative assessment of the likely impact of development trips on the local highway network, a forecast trip distribution profile has been derived using 2011 Census Journey to Work data.

5.7.2 The Census data shows the home locations (at MSOA-level) of individuals who work within the 'Torfaen 008' MSOA. The home locations of those who travel by car have been grouped according to the likely direction that they will travel to / from the site. This has been validated through the use of publicly available route planning software. In order to provide a reliable distribution, the extents of the study area have been bound to include the following Origin and Destination (OD) points:

- Turnpike Road (West);
- A4042 Turnpike Road;
- A4042 Croesyceiliog Bypass;
- LlanYr Avon Way; and
- Caerleon Road.

5.7.3 As part of the access strategy for the site, all staff vehicle traffic is assumed to access the new facility using the entrance / exit from the Crownbridge School Roundabout. This is in line the scheme layout discussed in Chapter 3.

5.7.4 **Table 5-8** summarises the site based staff trip distribution profile and the forecast staff vehicle movements to / from each OD point in the typical weekday AM and PM peak hours for the highway network. The site based staff vehicular trip generation set out in **Table 5-4** has been applied to the O/D proportions.

Table 5-8: Site Based Staff Vehicle Trip Distribution

O/D Point	Proportion	AM (08:00-09:00)			PM (16:00-17:00)		
		Arrivals	Departures	Two-Way	Arrivals	Departures	Two-Way
Turnpike Road (West)	25.7%	11	0	11	3	11	14
A4042 Turnpike Road	28.8%	13	0	13	3	12	16
A4042 Croesyceiliog Bypass	26.5%	12	0	12	3	11	14
LlanYr Avon Way	14.1%	6	0	6	2	6	8
Caerleon Road	4.9%	2	0	2	1	2	3
Total	**100%**	**44**	**0**	**44**	**11**	**43**	**54**

5.7.5 **Table 5-8** shows that, based on available information from Census data, this forecasts that a fairly even split of vehicle trips could be anticipated to originate from the A4042 Turnpike Road, A4042 Croesyceiliog Bypass and Turnpike Road (West).

5.7.6 Traffic flow diagrams have been developed to illustratively set out the forecast AM and PM peak hour Proposed Development traffic. These are provided in **Appendix G**.

Visiting Staff

5.7.7 Consideration has been given to staff visiting the Proposed Development to undertake training, it was concluded that it cannot be forecast where staff will originate from to make the journey to/from the Proposed Development. The location of staff will change daily, therefore for the purpose of assessment it has been assumed that 50% of visiting staff will originate from the A4042 Turnpike Road and 50% from the A4042 Croesyceiliog Bypass.

5.7.8 Traffic flow diagrams showing the forecast AM and PM peak hour Proposed Development traffic, illustratively, are provided in **Appendix G**.

5.8 Operational Vehicles and Visitors

5.8.1 Due to the nature of the Proposed Development and the types of trips that are associated with the operational vehicles and visitors, it is not possible to accurately forecast where these trips will originate from or their likely destination. The origins and destinations for these trips will vary daily and will be spread through a 24-hour period. Any impact upon the network peak hours is likely to be immaterial, therefore these trips are not included in the trip distribution and junction modelling.

5.9 Summary

5.9.1 During the network weekday AM peak hour, 44 staff vehicles are forecast to arrive at the Proposed Development. In the network weekday PM peak hour, 11 staff vehicles are forecast to arrive at the Proposed Development and 103 staff vehicles are forecast to depart from the Proposed Development. This includes staff visiting the Proposed Development to undertake training.

5.9.2 Through internal demand and operational forecasts, it has been determined by Gwent Police that there will be on average approximately 26 Detainees brought to the site per day. This would result in an average of 52 trips per day (102 two-way movements) associated with Detainees.

5.9.3 There are anticipated to be 47 operational vehicles on-site to meet the needs of the Proposed Development, this includes blue light vehicles. Due to the nature of the operational vehicles and blue light vehicles being called when required, the number of vehicles arriving and departing from the site per hour cannot be forecast.

5.9.4 Based on visitor analysis provided by Gwent Police, it is anticipated that there will be approximately four visitors per day to the custody unit and a further eight visitors to operational policing.

5.9.5 The forecasts which have been calculated and presented are for traffic that already exists elsewhere within the local network. Through review, it has been determined by Gwent Police that this existing traffic currently travels inefficiently within the local and wider area. This has seen a proposed investment scheme allocated to the subject site to develop new facilities to provide county wide operational efficiencies and to work towards achieving Police Authority carbon and pollution reduction. Should the Proposed Development be constructed, it will result in the vehicle kilometre savings of operational and staff vehicle travel that will benefit the wider network.

6. Traffic Impact Assessment

6.1 Introduction

6.1.1 This chapter of the TA provides an assessment of the impact of the development proposals on the highway network and considers this specifically during the weekday AM and PM peak hours.

6.1.2 The overall impact of the proposals has been considered in the context that the site has operated as a Police Headquarters for a number of years and the proposals are forecast to result in a significant reduction in site based staff over the number that have historically been present at the premises. Therefore, the impact of the Proposed Development on the operation of Turnpike Road Roundabout, the immediate local junction and access to the Torfaen strategic highway network, has been considered in this chapter. This is considered to be an appropriate extent of assessment when considering the existing consent site use, forecast staff reductions at the site and overall operation efficiencies sought to be achieved over the county wide area.

6.1.3 The Proposed Development is expected to be fully operational in 2026. As a result the following future scenarios have been identified to assess the impact of the Proposed Development on the local the highway network:

- 2026 Base + Committed Development; and
- 2026 Base + Committed Development + Proposed Development.

6.2 Assessment Scenarios

6.2.1 Traffic flows have been derived for four assessment scenarios, comprising a '2023 Base', '2026 Base', '2026 Base + Committed Development' and a '2026 Base + Committed Development + Proposed Development', which have then been used for traffic impact assessment purposes. For each scenario, the following time periods have been assessed, comprising the morning and evening peak hours:

- AM Peak Hour: 08:00 – 09:00hrs; and
- PM Peak Hour: 16:00 – 17:00hrs.

6.2.2 Section 2.4 of the TA sets out the derivation of the morning and evening peak hours, based on 2022 surveys of the Turnpike Roundabout junction, conducted as part of the Transport Assessment to accompany the planning application (23/P/0430/FUL) for the expansion of the Emergency Department at The Grange University Hospital. A copy of the traffic survey data is provided in **Appendix A**.

'2023 Base' Scenario

6.2.3 As part of the Transport Assessment to accompany the planning application (23/P/0430/FUL) for the expansion of the Emergency Department at The Grange University Hospital a Manual Classified Count was undertaken. The traffic survey data presented in the Transport Assessment have been used in this report. The survey was conducted on Thursday 16th June 2022. Gwent Police Headquarters was fully operational at the site in June 2022, therefore, this traffic survey includes traffic that was associated with the existing Gwent Police Headquarters. Therefore, the peak hours under consideration in these assessment scenarios contain Gwent Police traffic impact of operating the site in its previous use.

6.2.4 A growth forecast has been applied to the 2022 flows using growth factors derived from TEMPro (Version 7.2). Growth factors (as outlined in **Table 6-1**) for 2022-2023 have been applied to all movements at the roundabout. These flows have been used to form the basis of a '2023 Base' scenario.

‘2026 Base’ Scenario

6.2.5 The opening year of the Proposed Development is anticipated to be 2026. An assessment year of 2026 has been derived by applying a growth forecast to the ‘2023 Base’ traffic flows, as outlined above. The traffic flows for this scenario includes traffic associated with the existing Gwent Police Headquarters. This traffic has not been removed due to the complexity of determining what the traffic impact could be on a given survey day. The inclusion of the traffic associated with the past use of the site will ensure that a robust assessment has been carried out and one that is beyond the traffic impact that would be experienced on the local highway network, as part of these proposals.

‘2026 Base + Committed Development’ Scenario

6.2.6 The ‘2026 Base + Committed Development’ scenario has been derived by adding the traffic forecast for developments that are committed in the local area to the ‘2026 Base’ flows for the AM and PM peak hours. The traffic flows for the committed developments have been obtained from Transport Assessments / Statements which have been submitted to accompany the planning applications. This is publicly available information from the Torfaen Planning Application website. Please see below, Section 6.4, which sets out the extent of committed development in more detail. As detailed above in the base year, the traffic flows for this scenario includes traffic associated with the existing Gwent Police Headquarters.

6.2.7 Traffic flow diagrams of the committed development traffic are provided in **Appendix F**.

‘2026 Base + Committed Development + Proposed Development’ Scenario

6.2.8 The ‘2026 Base + Committed Development + Proposed Development’ scenario has been derived by applying the Proposed Development traffic (as set out in Chapter 5 of the TA) to the '2026 Base + Committed Development’ flows for the AM and PM peak hours. The proposed trip generation of the development is documented in Chapter 5 of the TA and forms the basis of the assessed Proposed Development traffic.

6.2.9 It is important to highlight that the traffic flows for this scenario includes traffic associated with the existing Gwent Police Headquarters. Therefore, this provides an overestimation of the future traffic flows at the Turnpike Roundabout with the Proposed Development. A simplistic approach could be to present the traffic impact and resist any junction capacity modelling due to a lower forecast staff population at the site, over that historically accepted. However, for the purpose of robust assessment, the traffic analyses have been processed to capacity modelling.

6.2.10 Traffic flow diagrams of the Proposed Development traffic are provided in **Appendix F**.

6.3 Traffic Growth

6.3.1 The 2022 baseline traffic flows for the local highway network, presented in Chapter 2 of this report, have been ‘growthed’ up to 2023 and 2026 using TEMPro (Version 7.2); this is an industry standard tool that provides forecasts for growth in background traffic, based on planning projections for growth in housing, employment and car ownership. Growth factors have been derived for the ‘Torfaen 008’ MSOA, which covers the extent of the local highway network study area and is therefore considered suitable. The average growth factors for 'Urban, Principal' road types are presented in **Table 6-1**.

Table 6-1: TEMPro Growth Factors

Growth Period	AM Peak	PM Peak
2022-2023	1.0078	1.0076
2022-2026	1.0295	1.0288

6.4 Committed Development

6.4.1 As set out earlier in this chapter, to robustly assess the impact of the Proposed Development on the adjacent highway network, local committed development schemes have been taken into consideration. This TA therefore includes traffic associated with the following committed development schemes which are shown in **Figure 6-1**.

1. 146 New Dwellings (21/P/0926/NMA of 18/P/0798/FUL);
2. Crownbridge School Extension (22/P/0503/FUL);
3. Specialist & Critical Care Centre (12/P/00348 Outline); and
4. Mental Health Unit (22/P/0446/OUT).

Figure 6-1: Committed Developments

6.4.2 The forecast trip generation for these committed developments are set out in the following Tables. The trip generation has been taken from the Transport Assessment / Transport Statement submitted for the planning permission which is available to the public on the Torfaen planning portal. The vehicular trip generation for each committed development is set out in **Table 6-2** to **Table 6-5**.

Table 6-2: 146 Dwellings (21/P/0926/NMA of 18/P/0798/FUL) – Vehicular Trips Summary

	AM Peak			PM Peak		
	Arrivals	Departures	Two-Way	Arrivals	Departures	Two-Way
Vehicles	14	39	53	30	20	51

Source 18/P/0798/FUL Transport Assessment, page 26

Table 6-3: Crownbridge School Extension (22/P/0503/FUL) – Vehicular Trips Summary

	AM Peak			PM Peak		
	Arrivals	Departures	Two-Way	Arrivals	Departures	Two-Way
Existing Crownbridge School	34	28	62	0	3	3
Proposed Development	45	37	83	0	4	4
Net change	**11**	**9**	**21**	**0**	**1**	**1**

Source: 22/P/0503/FUL Transport Statement, page 18

Table 6-4: Specialist & Critical Care Centre (12/P/00348 Outline) – Vehicular Trips Summary

	AM Peak			PM Peak		
	Arrivals	Departures	Two-Way	Arrivals	Departures	Two-Way
Existing Llanfrechfa Grange Hospital	201	28	229	18	122	140
Proposed Development	477	150	628	142	303	444
Net Change	**276**	**122**	**399**	**124**	**181**	**304**

Source: 12/P/00348 Outline Transport Assessment, page 26

Table 6-5: Mental Health Unit (22/P/0446/OUT) – Vehicular Trips Summary

	AM Peak			PM Peak		
	Arrivals	Departures	Two-Way	Arrivals	Departures	Two-Way
Mental Health Unit	13	3	16	4	9	13
Proposed Development	44	14	69	16	39	55
Net change	**31**	**11**	**53**	**12**	**30**	**42**

Source: 22/P/0446/OUT Outline Transport Assessment, page 21

6.5 Junction Capacity Assessment

6.5.1 Junction capacity modelling has been carried out for the Turnpike Roundabout, in order to demonstrate to the LHA that the junction can successfully accommodate the forecast peak hour development traffic demand without undue impact on the existing highway network. Turnpike Roundabout lies in close proximity to the southern access into the site from Turnpike Road. It has been determined that the inclusion of this junction as a study area is appropriate due to the existing consented use of the premises and the proposals to reduce site based staff and introduce county wide operational efficiencies.

6.5.2 The junction modelling assessment has been undertaken using the industry-standard software package 'Junctions 9'. Operational performance is summarised for all arms in terms of their Ratio of Flow to Capacity (RFC). Roundabouts are typically considered to operate satisfactorily in terms of capacity when the RFC is below 0.85 ('practical' capacity). An RFC value of 1.00 represents 'absolute' capacity. Queues summarised in the tables below have been rounded up to the nearest full vehicle.

6.5.3 Full junction modelling results can be found at **Appendix G.**

Turnpike Roundabout

6.5.4 **Table 6-6** reports the junction capacity modelling results for the Turnpike Roundabout for the AM and PM peak hours. This shows that the junction is forecast to operate within practical capacity in both 2023 and 2026 Base scenarios, with maximum RFC forecast to be 0.82 on the northern arm of the A4042 during the AM peak hour in the 2026 Base scenario.

6.5.5 The impact of committed development traffic has been assessed and it has been determined that this increases the RFC on the A4042 (North) to 1.02, which exceeds absolute capacity. Queueing also increases to 45 PCUs on the northern arm of the roundabout.

6.5.6 The addition of Proposed Development traffic in the '2026 Base + Committed Development + Proposed Development' has a negligible effect on the RFC of the northern A4042 arm and results in a minor increase in queueing of approximately four PCUs. This is not considered to be a material impact in terms of Proposed Development traffic, it could not be visibly perceived against daily typical fluctuations in traffic.

6.5.7 Furthermore, as set out in Chapter 5 of this TA, the traffic flows for this scenario includes traffic associated with the existing Gwent Police Headquarters. Therefore, this provides an overestimation of the future traffic flows at the Turnpike Roundabout, in terms of total traffic associated with the Proposed Development. It could be considered that the proposals, which result is significantly less staff based on site, could have a lesser traffic impact over a full 24-hour period.

Table 6-6: Junction Modelling Results – Turnpike Roundabout

Scenario	Arm	AM (08:00-09:00)		PM (16:00-17:00)	
		Queue (PCUs)	RFC	Queue (PCUs)	RFC
2023 Base	A4042 (North)	5	0.80	1	0.48
	Caerleon Road	1	0.35	1	0.45
	A4042 (South)	2	0.55	2	0.62
	Turnpike Road	1	0.33	1	0.32
2026 Base	A4042 (North)	5	0.82	1	0.49
	Caerleon Road	1	0.36	1	0.47
	A4042 (South)	2	0.56	2	0.63
	Turnpike Road	1	0.34	1	0.34
2026 Base + Committed Development	A4042 (North)	45	1.02	2	0.53
	Caerleon Road	1	0.48	2	0.67
	A4042 (South)	3	0.68	3	0.70
	Turnpike Road	1	0.46	1	0.40
2026 Base + Committed Development + Proposed Development	A4042 (North)	49	1.02	2	0.54
	Caerleon Road	1	0.48	3	0.68
	A4042 (South)	3	0.69	3	0.70
	Turnpike Road	1	0.46	1	0.49

6.6 Summary

6.6.1 As part of the Transport Assessment to accompany the planning application (23/P/0430/FUL) for the expansion of the Emergency Department at The Grange University Hospital a Manual Classified Count was undertaken. The traffic survey data presented for the planning application is publicly available and has been used to inform the assessments undertaken within this report. The survey was conducted on Thursday 16th June 2022.

6.6.2 The application of the growth forecasts to the 2022 traffic flows generates the '2023 Base' and '2026 Base' scenarios. The opening year of the Proposed Development is 2026. Forecast traffic flows from committed developments in the local area have been considered to generate the '2026 Base + Committed Development' scenario. The application of the assigned development traffic has been applied to the '2026 Base + Committed Development' scenario generates the '2026 Base + Committed Development + Proposed Development' scenario.

6.6.3 The overall impact of the proposals has been considered in the context that the site has operated as a Police Headquarters for a number of years and the proposals are forecast to result in a significant reduction in site based staff, over that which existed. Therefore, the impact of the Proposed Development on the operation of Turnpike Road Roundabout, the immediate local junction and access to the Torfaen strategic highway network, has been considered. This has been determined to be an appropriate extent of assessment when considering the existing consented site use, forecast staff reductions at the site and overall operation efficiencies sought to be achieved over the county wide area.

6.6.4 Junction capacity modelling has been carried out for the Turnpike Road Roundabout. The junction modelling assessment has been undertaken using the industry-standard software package 'Junctions 9'. The junction is forecast to operate within practical capacity in both 2023 and 2026 Base scenarios. The impact of committed development traffic increases the RFC on the A4042 (North) to 1.02 in 2026, which exceeds capacity. Queueing also increases to 45 PCUs on the northern arm of the roundabout.

6.6.5 The addition of Proposed Development traffic in the '2026 Base + Committed Development + Proposed Development' has a negligible effect on the RFC of the northern A4042 arm and results in a minor increase in queueing of approximately four PCUs. This is not considered to be a material impact in terms of Proposed Development traffic and could be considered as negligible given daily fluctuations in traffic at this junction.

6.6.6 Furthermore, all of the scenarios include traffic associated with the existing Gwent Police Headquarters. The Proposed Development is anticipated to reduce the number of staff associated with this site compared to the existing use. Therefore, this provides an overestimation of the future traffic flows at the Turnpike Roundabout, in terms of total traffic associated with the Proposed Development. It could be considered that the proposals, which result is significantly less staff based on site, could have a lesser traffic impact over a full 24-hour period.

6.6.7 In addition, by designating the proposed Police Hub as the main custody facility for the area, this will significantly reduce travel times for the transportation of custody detainees, operational and emergency services, vehicle workshop, training facilities and Police Hub services thereby reducing vehicle kilometres over the wider network.

7. Transport Implementation Strategy

7.1 Introduction

7.1.1 TAN 18 requires any TA document to provide the information necessary to assess the suitability of an application in travel demand and traffic impact terms. It recommends that a TIS should be included within the TA. The TIS is intended to set objectives and targets in managing travel demand, whilst detailing the infrastructure and measures necessary to achieve them. The TIS should also set up a framework for monitoring the targets including modal travel choice.

7.1.2 A TIS shares many of the same goals as a TP; therefore, the modal information, targets and measures set out in this chapter will inform the TP which has been developed in line with BREEAM requirements and which will accompany the formal planning application submission for this scheme.

7.2 Mode Share and Targets

7.2.1 Mode share targets are used to evaluate the success of the TIS and to identify areas on which further measures should be focused in order to help to drive travel behaviour change. To enable the setting of valid and realistic targets, a valid baseline first needs to be established.

7.2.2 **Table 5-3** sets out the forecast mode share of the staff based at the Proposed Development. This has been determined from 2011 census data using respondents who work in the 'Torfaen 008' MSOA. This shows that 84% of staff are forecast to travel as a driver of a car / van, 5% as a passenger in a car / van, 6% on foot, 3% via public transport (including rail), 1% via bicycle and 1% via motorcycle.

7.2.3 A TP will be submitted with the formal planning application submission and will be required to be in place when the Operational Facility is fully operational, it is appropriate to set targets based on the forecast mode share for that time. The target will be to reduce the 'car' mode share travel by 6% for staff over five years, consistent with the DfT report *Smarter choices: Changing the way we travel* (2004). Following a baseline travel survey these targets can be confirmed or adjusted as appropriate, during the drafting of the TP and following discussions between TCBC and the Travel Plan Coordinator (TPC). It should be highlighted that in the context of the proposed development Gwent Police are investing in operational efficiencies which will benefit the county wide area, and which will result in vehicle kilometre reductions likely to be higher than site based TP target reductions.

7.3 Monitoring and Evaluation

7.3.1 The point at which baseline travel surveys are required will be subject to agreement with TCBC as the LHA. A minimum response rate to the travel surveys will be required to be set and agreed to ensure that the data is representative.

7.3.2 The format of the baseline and monitoring surveys will also need to be agreed with TCBC. In general, these will seek to establish the actual travel patterns, the reasons for travel choice and potential measures to encourage consideration of alternatives. For staff, it is envisaged that the surveys will be primarily online-based, but paper copies will also be made available to staff should they prefer.

7.3.3 The results of the baseline travel surveys will be analysed and the factors influencing travel behaviour will be investigated. It will then be necessary for the TPC to review and update the respective TP to include additional details and the need for any other measures not already included that require further investigation. Specific objectives and targets will need to be identified, separated into short/medium/long term targets, and will need to be SMART (Specific, Measurable, Achievable, Realistic, and Timed). Specific actions and measures to encourage sustainable modes of travel will be identified. For the on-going management of the TP to be successful and to deliver the desired outcomes, it is important that the parties involved in the delivery of the TP, which means the TPC, and TCBC, work effectively in partnership to achieve the desired results.

7.3.4 Monitoring of the TP will be required for a five-year period from the date of the baseline travel surveys. They will be undertaken at intervals of one, three and five years after the date (or close to the date) of the baseline travel surveys. The TPC will aim to coordinate the baseline travel surveys and subsequent monitoring surveys to ensure consistency between the collection of data for the TP. Surveys will avoid sustained periods of inclement weather or when there is significant disruption to the local road or public transport network.

7.3.5 A monitoring report will be prepared by the TPC for each monitoring survey. These will identify the results of the surveys and success of the measures implemented in achieving the targets. The reports will be submitted to TCBC for comment. If the targets are not met, then it will be necessary to review what remedial measures need to be implemented to mitigate the impact of any under achievement.

7.4 Travel Plan Measures and Interventions

7.4.1 In order to achieve the reduction in single occupancy car use and encourage a modal shift to more sustainable forms of travel, a number of TP measures will be implemented.

7.4.2 It is envisioned that the full TP will be secured as a Planning Condition and will be produced ready for full occupancy of the Proposed Development. A TPC will be appointed who will be responsible in ensuring the success of the TP and its targets and objectives. The TP will contain a range of measures additional to those that will be provided as part of the development to enhance the attractiveness of sustainable travel and to encourage the use of the walking, cycling and public transport infrastructure. Additional measures include:

- Newsletters to staff members;
- Noticeboards within the staff / visitor areas advertising sustainable transport information; and
- Promotion of national sustainable transport initiatives

7.4.3 Where possible, the TPC will work alongside staff to identify what additional measures could be implemented.

7.5 Physical Measures and Interventions

7.5.1 Physical measures will be implemented to encourage journeys to / from the Proposed Development using sustainable transport modes and to ensure that safe and secure access can be provided for non-motorised users.

On-Site Measures

7.5.2 Secure cycle parking (36 spaces) will be provided near the entrance of the Police Hub. As set out in Chapter 3 of this TA, BREEAM Topic Tra02 covers the provision of sustainable transport measures to encourage the uptake of non-car travel to / from the development. In terms of cycling, this includes:

- Option 7: ‘Install compliant cycle storage spaces to meet the minimum levels’, i.e., one space per 10 members of staff (for ‘Other’ building types).
- Option 8: (Achieve Option 7 and) ‘Provide at least two compliant cyclists’ facilities for the building users’, to include showers, changing facilities, lockers, drying spaces.

7.5.3 Based on a maximum of 348 staff, 1 space per 10 staff equates to 35 cycle parking spaces for the Proposed Development. As stated above, the development proposals include the provision of 36 cycle parking spaces and therefore the provision meets the criteria for Option 7. Furthermore, the staff will be shift-based and therefore, all 348 staff will not be present on site at on-time resulting in a higher provision of cycle parking per staff.

7.6 Summary

7.6.1 Targets will be set in the TP for the reduction of private car use and a commitment to a TP and monitoring programme has been made. These targets will need to be reviewed in the context of the location of the site and the results of the first travel surveys. The measures that will be implemented as part of the development proposals have been outlined to help to achieve the targets and objectives set. This will include the provision of cycle parking in close proximity to the building access.

7.6.2 TP measures will add another layer of interventions once the TP is established. This will continue to promote and encourage the range of facilities available and improve awareness or provision wherever possible.

8. Summary and Conclusion

8.1 Summary

8.1.1 This TA has been prepared by AECOM on behalf of Wilmott Dixon Construction Ltd in respect of a planning application to redevelop and existing Gwent Police site to build a new operational facility for Gwent Police and associated parking. The facility will employ a total of around 348 staff and operate on a 24-hour basis in order to satisfy the operational requirements of the proposed use. Staff will work shift patterns meaning that the maximum number of staff on site at any one time is anticipated to be 251 (during shift changeovers). The on-site car park will provide a total of 299 spaces for staff, visitors and operational vehicle.

8.1.2 The development site was formerly used as Gwent Police Headquarters and is located in Llanyravon, Cwmbran. Gwent Police Headquarters has been relocated to a site on Llantarnam Park Way to the south of Cwmbran. The majority of services that used to be based at this premises off Turnpike Road have already been moved to their new location. However, the buildings remain in place and therefore the consented land use is also considered to be valid. At full operation, the Police Headquarters had capacity for approximately 480 staff on-site. There are currently 307 parking spaces on the site.

8.1.3 A detailed review of the existing highway network and baseline situation has been carried out. The site benefits from existing sustainable travel. This includes an active travel network with a vast footpath network and stretches of cycle routes. Whilst there are currently limited opportunities for active travel south of the site, there is planned walking and cycling infrastructure in Oakfields and in the wider Torfaen area. Opportunities for public transport use has been identified including bus stops 180m from the site and the Cwmbran Station approximately a 20 minute (1.8km) walk northwest of the premises.

8.1.4 PIC data has been obtained from the ‘Crashmap’ online resource to determine whether there are any locations on the local highway network with poor collision records. Over the most recently available five year period (2017-2021), eight PICs have been identified to have occurred within the vicinity of the proposed site. The low number of PICs over the five year period suggests no existing safety issues in the area local to the Proposed Development. Replacing the existing site use, is unlikely to give rise any issues of safety to highway users. The operational efficiencies of locating Police services at this location could result in improvements in safety records in other county areas and reduced response times to vehicular collision call outs.

8.1.5 The site has good accessibility to bus and rail services, in addition to pedestrian and cycle infrastructure. A Travel Plan has been prepared for the scheme, in line with BREEAM requirements, and will aim to encourage the use of sustainable modes of travel by staff and visitors.

8.1.6 There are two existing access points to the Proposed Development, one from the north of the site off the roundabout on Turnpike Road and the second from the southwest of the site onto Turnpike Road, near Turnpike Roundabout. Vehicular access to the Proposed Development will be from main access point, southwest of the premises from Turnpike Road. The current forms of access are not proposed to be changed as part of the development, except for minor enhancements or improvements to the kerb radii or alignment.

8.1.7 Staff will enter and exit the site via the access to the north of the site which connects to the Crownbridge School Roundabout, via an unnamed road. This includes staff that are visiting the site for the Specialist Training Facility.

8.1.8 A one-way system is proposed for the custody vehicles where they will enter from the Turnpike Road access, before circulating the site to the rear of the Police Hub building and exiting through the staff car park to the northern access connection to Crownbridge School Roundabout.

8.1.9 Response vehicles will enter/exit the site via the main access on Turnpike Road. Visitors will enter and exit the site via the Turnpike Road access.

8.1.10 The proposed car park will provide 299 total parking spaces including 22 EV parking spaces, six motorcycle spaces and four accessible spaces. Enclosed and secure cycle stores will provide 36 cycle parking spaces.

8.1.11 The development proposals are considered to align with the policies in PPW, TAN 18, the LDP, Draft LDP and LTP. They support the focus on reducing the need to travel, which for emergency services should also include the need for operational efficiencies. The Proposed Development consolidates services that are spread out across the constabulary. By relocating services into one location, this will reduce the number of vehicles required and the distances travelled and improve efficiencies in essential operations.

8.1.12 The Proposed Development is anticipated to result in a reduction of 132 staff based on the site compared to the accepted and historic existing use. The extent of parking required will also be reduced from that which currently exists. Information has been provided by Gwent Police on the anticipated number of staff per service / department and details on shift patterns. As a result of the analysis carried out with this information, it is forecast that there will be a maximum of 251 members of staff on site at any one time. It is forecast that, as a worst case scenario, there will be 52 staff arrivals per hour within the AM peak period, and 65 departures per hour within the PM peak period.

8.1.13 The Specialist Training Facility is anticipated to have approximately 60 staff per day visiting the site to undertake training. The training sessions will occur between 08:00hrs and 16:00hrs.

8.1.14 Through internal demand and operational forecasts, it has been determined by Gwent Police that there will be on average approximately 26 Detainees brought to the site per day. With the 50 cell capacity allowing for change over processing, larger scale incidents and a rotating wing kept clear and on standby for emergency procedures. There would be two trips associated with each Detainees to account for the booking in and an officer arriving to interview the Detainee. This would result in an average of 52 trips per day (102 movements) associated with Detainees. Due to the nature of these trips, it cannot be forecast how many trips are likely to occur during the peak hours. The arrival and departure profile for Detainees will vary on a day-to-day basis.

8.1.15 Furthermore, there will be 47 operational vehicles based on site to satisfy the operational needs of the Proposed Development, these include blue light vehicles.

8.1.16 Based on visitor analysis provided by Gwent Police, it is anticipated that there will be approximately four visitors per day to the custody unit and a further eight visitors to operational policing.

8.1.17 The overall impact of the proposals has been considered in the context that the site has operated as a Police Headquarters for a number of years and the proposals are forecast to result in a significant reduction in site based staff, over that which existed. Therefore, the impact of the Proposed Development on the operation of Turnpike Road Roundabout, the immediate local junction and access to the Torfaen strategic highway network, has been considered. This has been determined to be an appropriate extent of assessment when considering the existing consented site use, forecast staff reductions at the site and overall operation efficiencies sought to be achieved over the county wide area.

8.1.18 Junction capacity modelling has been carried out for the Turnpike Road Roundabout. The junction modelling assessment has been undertaken using the industry-standard software package ‘Junctions 9’. The junction is forecast to operate within practical capacity in both 2023 and 2026 Base scenarios, with maximum RFC forecast to be 0.82 on the northern arm of the A4042 during the AM peak hour in the 2026 Base scenario.

8.1.19 The impact of committed development traffic increases the RFC on the A4042 (North) to 1.02, which exceeds absolute capacity. Queueing also increases to 45 PCUs on the northern arm of the roundabout.

8.1.20 The addition of Proposed Development traffic in the ‘2026 Base + Committed Development + Proposed Development’ has a negligible effect on the RFC of the northern A4042 arm and results in a minor increase in queueing of approximately four PCUs. This is not considered to be a material impact in terms of Proposed Development traffic and could not be perceived against daily fluctuations in traffic at this junction.

8.1.21 Furthermore, as set out in Chapter 5 of this TA, the traffic flows for this scenario includes traffic associated with the existing Gwent Police Headquarters. Therefore, this provides an overestimation of the future traffic flows at the Turnpike Roundabout, in terms of total traffic associated with the Proposed Development. It could be considered that the proposals, which result is significantly less staff based on site, could have a lesser traffic impact over a full 24 hour period.

8.1.22 In addition, by designating the proposed Police Hub as the main custody facility for the area, this will significantly reduce travel times for the transportation of custody detainees, operational and emergency services, vehicle workshop, training facilities and Police Hub services thereby reducing vehicle kilometres over the wider network.

8.2 Conclusion

8.2.1 The Proposed Development will comply with the national, regional and local policy and guidance. The development proposals support the focus on reducing the need to travel. The aim of the Proposed Development is to consolidate services that are spread out across the constabulary in order to improve efficiencies in essential operations. This will result in vehicle kilometre savings for operational vehicles across the region and reduction in the number of vehicles and distance travelled. The site is also located with convenient access to a rail station, bus stops, walking and cycling facilities. In summary, the proposals comply with national and local policies.

8.2.2 The Proposed Development will make use of an existing site which has a consented use for Police Headquarters, which has operated for many years with significantly higher levels of site based staff and larger parking area. The analyses in this TA have demonstrated that the proposals will result in less staff based on site, less parking, likely reductions in local traffic impact and confirmed reductions it wider area traffic impact.

8.2.3 Further to the findings of this TA following detailed assessments, it can be concluded that there are no transport planning related reasons why the proposed development could not be supported by the LHA and LPA. It would seem appropriate and acceptable to continue to allow the site to operate for Police Operation related services.

9. BREEAM Compliance

9.1.1 **Table 9-1** provides a checklist of information to show where the BREEAM requirements have been met, which will assist in determining compliance.

Table 9-1: BREEAM Criteria and Compliance

Number	Criteria	Compliance
TRA 01	a: Existing, travel patterns and opinions of existing building or site users towards cycling, walking and public transport, to identify relevant constraints and opportunities.	Information not available.
	b: Travel patterns and transport impact of future building or site users.	Set out in Section 5 and 6 of TA.
	c: Current local environment for pedestrians and cyclists, accounting for any age-related requirements of occupants and visitors;	Set out in Section 2 of TA.
	d: Reporting of the number and type of existing accessible amenities, within 500m of the site	Set out in Section 2 of TA.
	e: Disabled access accounting for varying levels and types of disability, including visual impairment.	Shown on layout drawings contained within Appendix D
	f: Calculation of the existing public transport Accessibility Index (AI)	Set out in Section 2.7 of TA and Appendix C
	g: Current facilities for cyclists	Set out in Section 2 of TA.
	The occupier has been involved in the development of the TP.	Gwent Police has been involved throughout the project, informing the Transport Planning inputs and will continue to be involved in the Travel Plan preparation and implementation.
	The TP will be implemented post construction and will be supported by the building's management in operation.	The TPs implementation are secured by planning condition. The TP includes a commitment to the implementation of the measures and regime contained within.
TRA 02 *Credits 1 to 10 Transport Options Implemented*	**Public Transport Measures** • The existing AI achieves all 28 (1). • Increase in AI through (i) negotiations with bus / train companies (2) or (ii) a dedicated service (3). • Public Transport information system (1).	The site location has an AI score of 1.26 which, according to BREEAM guidance, is not sufficient to achieve one credit for this building type.
	Private Transport Measures • Electric charging for at least of 10% of the total car parking capacity (1). • Car sharing group or facility for at least 5% of the total car parking capacity (1).	• 22 electric vehicle charging points to be provided comprising 10% of the total car parking spaces.
	Active Travel Measures • Consult with the Local Authority on the state of the local cycle networks and public accessible routes (2). • Compliant cycle storage (1). • At least two compliant cyclist facilities (1). • Three existing amenities present (1).	• Pre-application discussions with the Local Highway Authority (LHA) have been initiated as part of the preparation of the TA. Pre-Application Consultation (PAC) is an appropriate statutory consultation period for such comments or input to be provided by the LHA and other groups. • Cycle storage and appropriate lockers / changing facilities / showers / drying spaces to be provided.
	Alternative Transport Measures • Site specific improvement measures (not covered above) implemented (1-3).	None identified. The proposals are intended to improve operational efficiency over a wider area in Torfaen, with benefits to be experienced beyond the immediate site location.

Appendix A Transport Assessment Scoping Note

Scoping Note

Project:	**Gwent Police Operational Facility**	Job No: 60693552
Subject:	**Transport Assessment Scoping Note**	
Prepared by:	**Laura van Heezik (Senior Transport Planner)**	Date: August 2023
Checked by:	**Spiro Panagi (Associate Director)**	Date:August 2023
Approved by:	**Spiro Panagi (Associate Director)**	Date:August 2023

Figures

1. Introduction

AECOM has been commissioned by Wilmott Dixon Construction Ltd to provide transport planning services for the redevelopment of the outworn Gwent Police Headquarters site to build a new Gwent Police Operational Facility which will include a Police Hub, Training Centre and Vehicle Workshop. This Scoping Note for a Transport Assessment (TA) is submitted to Torfaen County Borough Council (TCBC), in its role as Local Highway Authority (LHA), for agreement and approval.

The existing buildings are still in place on the application site and therefore it is considered that there is an existing lawful planning use for Police Operations. The existing site, at full operation included a maximum of 480 staff based on site. It is understood that the existing site operated with the use of a car park with over 300 car parking capacity.

The proposed development masterplan which is expected to be submitted for planning consideration includes parking provision for significantly smaller number of site based staff and a lower number of car parking. Therefore it can be considered that the proposals could result in a similar or lower levels of vehicles accessing and parking at the site. The TA will consider the past and present Police services and provide information, where possible, on the daily traffic profiles.

The proposed site is located in Cwmbran and is accessed via Turnpike Road and the Crownbridge School Roundabout. The location of the Proposed Development is shown in **Figure 1-1**.

2. Study Area

It is envisaged that the study area for the TA will comprise of Turnpike Road and the adjacent section of the A4042, in particular Turnpike Roundabout.

3. Existing Situation and Site Accessibility

The TA will include the following:

- Description of the site location and existing usage;
- Description of the local highway network, including speed limits, street lighting, etc;
- Description of the existing highway operational conditions with reference to traffic survey data;
- Analysis of Personal Injury Collision (PIC) data;
- Description of existing walking/cycling facilities;
- Description of public transport services; and
- Identification of key local facilities and their accessibility by sustainable modes.

4. Proposed Development

The Development Proposals comprise the construction of a new Operational Facility for Gwent Police which will include a Police Hub, Training Centre and Vehicle Workshop on the site of the old Gwent Police Headquarters. An illustrative masterplan of the development proposals is shown in **Figure 4-1**. The majority of services that used the site have recently been relocated to the new Gwent Police Headquarters located to the south of Cwmbran.

The proposed development will include a maximum of 348 staff based on site and the proposed Training Centre will have approximately 60 staff visiting to undertake training per day. Detailed analysis of staff arrival / departure profiles will be provided within the TA, where this is possible to do so.

The TA will also include details relating to the following:

- Details of the access arrangements;
- Internal transport layout for the site, including cycle and car parking provision (staff and visitor) and circulation along with pedestrian circulation; and
- Swept Path Analysis (SPA) to demonstrate that larger vehicles (refuse, delivery and emergency) can be accommodated.

5. Parking and Access

On-site parking will be provided to staff, visitors to the facility, and operational vehicles. The following allocation is proposed:

- **Staff:** 193 parking spaces;
- **Visitor:** 13 parking spaces;
- **Operational:** 93 parking spaces;
- **Accessible parking:** four spaces;
- **Motorcycle:** six motorcycle spaces; and
- **Cycle:** 36 cycle spaces.

With reference to Torfaen County Borough Council (TCBC) parking standards which are presented in Supplementary Planning Guidance (SPG),and based upon the CCS Wales Parking Standards (2014), there are no parking standards for this type of land use or “sui generis” developments. This is considered to be appropriate. Visitor parking equates to around 4% of the total parking provision.

The level of staff car parking is not proposed to increase to from the existing provision on the site due to the number of staff not anticipated to significantly increase for the Proposed Development. There are currently 307 staff parking spaces on the site. The Proposed Development masterplan currently includes the provision of 193 staff car parking spaces. Staff will enter and exit the site via the access to the north of the site which connects to the Crownbridge School Roundabout.

In terms of operational parking provision, this includes response vehicles and custody vehicles, Gwent Police have stated that they will require 93 spaces for the Proposed Development based on experience to meet operational demand. Response vehicles will enter/exit the site via the main access on Turnpike Road. A one-way system is proposed for the custody vehicles where they will enter from the main access and go to the Police Hub and exit through the staff car park to the northern access.

The Proposed Development will not be open for the public to visit or to report crime, this will be a secure site and all visitors to the site will be there via invitation or supervised transport and it is therefore anticipated that visitor parking can be managed. Visitor parking is proposed by the Training Centre building, 13 spaces will be provided. Visitors will enter / exit the site via the main entrance on Turnpike Road.

TCBC parking standards state that 5% of total car parking capacity should be blue badge parking. It is proposed that four accessible parking spaces will be provided on-site. It is proposed that three of the accessible spaces will be provided in the visitor parking near the entrance to the Police Hub. An accessible parking space will also be provided in the staff parking area by the access gate.

EV charging infrastructure is currently proposed at a level of 10% of parking spaces for each user group (i.e. staff, visitor, operational). This allocation aligns with Planning Policy Wales (PPW) and emerging parking standards. In addition, one drop-off space will be provided on site.

The Proposed Development will include the provision of 36 cycle parking spaces. The cycle parking will be provided as three lockable cycle areas near the Police Hub.
There are no cycle parking standards provided within this SPG for this type of development land use or "sui generis" developments. The closest land use that has cycle parking standards is an office development. An office development will have a higher proportion of staff per m^2 than the Proposed Development. The cycle parking standards for an office land use are the following:

- Long Stay: 1 stand per 200m^2
- Short Stay: 1 stand per 1,000m^2

Furthermore, BREEAM Topic Tra02 covers the provision of sustainable transport measures to encourage the uptake of non-car travel to / from the development. In terms of cycling, this includes:

- Option 7: 'Install compliant cycle storage spaces to meet the minimum levels', i.e. one space per 10 members of staff (for 'Other' building types).
- Option 8: (Achieve Option 7 and) 'Provide at least two compliant cyclists' facilities for the building users', to include showers, changing facilities, lockers, drying spaces.

Based on a maximum of 348 staff, 1 space per 10 staff equates to 35 cycle parking spaces for the Proposed Development. As stated above, the development proposals include the provision of 36 cycle parking spaces and therefore the provision meets the criteria for Option 7. Furthermore, the staff will be shift-based and therefore, all 348 staff will not be present on site at on-time resulting in a higher provision of cycle parking per staff. Cyclist facilities including showers, lockers, changing facilities and drying spaces will be provided at the Proposed Development.

TCBC parking standards state that 5% of total car parking capacity should be provided as motorcycle, therefore based on the number of staff and visitor parking spaces proposed the Proposed Development should provide 11 motorcycle parking spaces. The Proposed Development will include the provision of six motorcycle parking spaces. It is not confirmed whether any motorcycle parking is provided on the existing premises. This level of provision is considered to be an improvement to the site parking composition. The motorcycle parking will be located in the north corner of the staff car park with the recommended bay size of 2.8m x 1.3m.

It is anticipated that, in the minimum, the electric charging parking spaces will in the order of expected emerging guidance of 10% of the parking capacity (excluding some operational parking in that calculation). There are policy requirements within the Police Authority that may be in place to confirm internal expectations for electric vehicle parking, we hope to have this information to include within the final version of the TA.

6. Planning Policy Review

The context of the development proposals will be considered in relation to the following policy documents:

- Planning Policy Wales: Edition 11, WG (2021);
- Wales Transport Strategy, WG (2021);
- Well-being of Future Generations (Wales) Act, WG (2015);

- Active Travel (Wales) Act, WG (2013);
- Technical Advice Note 18: Transport, WG (2007);
- South East Wales Valley Local Transport Plan (2015);
- Adopted Torfaen Local Development Plan (2013);
- Torfaen Sustainable Locations SPG (2023); and
- TCBC / CSS Wales: Wales Parking Standards (2014).

The TA will set out the compliance of the proposed development with the above policies and corresponding objectives.

7. Trip Generation and Distribution

Existing Trip Generation

Trip generation associated with the existing Police Headquarters will be calculated based on information relating to number of personnel, shift patterns and existing parking allocation. If the existing site has a Travel Plan, this will also be requested.

Proposed Trip Generation

Trip generation associated with the proposed development will be calculated based on advised numbers of staff, operational vehicles and visitors. If existing mode share data is available for staff, this will be used to inform an appropriate modal split in order to generate a proposed vehicle trip generation. This trip generation forecast will be considered against the background that includes a site that has already operated for a number of years as a Gwent Police Headquarters. The changes that could be experienced in traffic terms will be calculated in order to provide a comparison to the 'consented' or accepted position.

In addition, the proposed Training Centre will have approximately 60 staff visiting the site per day to undertake training. Therefore, in order to undertake a robust assessment it will be assumed that 60 visiting staff for the Training Centre will be present in the assessment hours.

Based on existing custody information for the constabulary it is forecast that there will be on average approximately 26 Detainees brought to the site per day. There would be two trips associated with each Detainees to account for the booking in and an officer arriving to interview the Detainee. This would result in an average of 52 trips per day (102 movements) associated with Detainees. Due to the nature of these trips, it cannot be forecast how many trips are likely to occur during the peak hours. The arrival and departure profile for Detainees will vary on a day-to-day basis.

There will be 47 operational vehicles based on site to satisfy the operational needs of the Proposed Development, these include blue light vehicles.

Based on visitor analysis provided by Gwent Police, it is anticipated that there will be approximately four visitors per day to the custody unit and a further eight visitors to operational policing.

Trip Distribution

It is proposed that the distribution of development traffic will be based on analysis of the 2011 Census 'Location of usual residence and place of work by method of travel to work' dataset. This will be undertaken at the Middle Super Output Level (MSOA), with 'Torfaen 008' being the appropriate MSOA, within which the entirety of the proposed development and surrounding highway network lies.

It is assumed that the response and custody vehicles will all arrive and depart from the site via the A4042 due to this being a strategic link for the region. Due to the nature of their journeys, we are unable to predict what direction the vehicles are most likely to go as these will vary each day.

8. Traffic Impact Assessment

The overall impact of the proposals will be considered in the context that the site has operated as a Police Headquarters for a number of years and the proposals are forecast to result in a significant reduction in site based staff over that which existed. Therefore, it is proposed that the TA will assess the impact of the Proposed Development on the operation of Turnpike Road Roundabout, the immediate local junction and access to the Torfaen strategic highway network. This is considered to be an appropriate extent of assessment when considering the existing consent site use, forecast staff reductions at the site and overall operation efficiencies sought to be achieved over the county wide area.

It is proposed that publicly available records sharing June 2022 traffic survey data will be used for the assessments in the TA. This data was submitted as part of the Transport Assessment to accompany the planning application for the extension of the Emergency Department at The Grange University Hospital (Planning Application Reference 23/P/0430/FUL). Manual Classified Turning Count (MCTC) data is provided for Turnpike Roundabout and Caerleon Road Roundabout in Appendix 4.2 of the approved Transport Assessment.

It is proposed that TEMPro growth factors are used to growth the June 2022 traffic flows to 2023 and the anticipated opening year of the Proposed Development (2026). This will generate traffic flows for '2023 Base' and '2026 Base' scenarios.

Traffic flows from local committed developments will be applied to the '2026 Base' scenario traffic flows to generate a '2026 Base + Committed Development' scenario. The following committed developments have been considered:

- 146 New Dwellings (21/P/0926/NMA of 18/P/0798/FUL)
- Crownbridge School Extension (22/P/0503/FUL)
- Specialist & Critical Care Centre (12/P/00348 Outline)
- Mental Health Unit (22/P/0446/OUT)

The proposed development will reduce the number of permanent staff on site from approximately 480 to 348. The trip generation of the existing Police Headquarters will be compared against the proposed vehicle trip generation, to understand the magnitude of difference between vehicle trips to/from the site, as well as on the local highway network.

Staff that are visiting the proposed development to undertake training will be encouraged to car share where possible, in particular if they work at the same Police Station. However, in order to undertake a robust assessment it will be assumed that all 60 daily staff will arrive individually by car.

It is not anticipated that the proposed level of vehicle trip generation will result in an increase in trips to/from the site, compared to the existing Police Headquarters. A simplistic approach could be used to present the traffic impact calculations and then seek to resist any junction capacity modelling due to a lower forecast staff population at the site, over that historically accepted. However, for the purpose of robust assessment, the traffic analyses will consider the traffic impact of the development on the local junction access onto the A4042 (Turnpike Road Roundabout).
however, A junction capacity assessment will be undertaken for the Turnpike Road Roundabout to assess the impact that the proposed development will have on the operation of the junction in the future.

Services that are currently located at various Gwent Police premises across the district will be relocated to the Proposed Development. This centralisation of services will reduce the number of vehicle trips generated by the other Gwent Polices premises and create efficiencies resulting in the saving of vehicle kilometres across Torfaen.

9. Transport Implementation Strategy (TIS)

The TA will include a TIS, which will consider potential measures, and appraise those already being implemented by the wider site, to increase the mode share of sustainable travel modes by staff. However, the Proposed Police Hub will be open 24/7 and therefore, staff that are starting and ending their shifts during unsociable hours or whom work directly with detainees, may not be actively encouraged to use active modes of travel or public transport due to concerns for personal safety, given the role that is being undertaken.

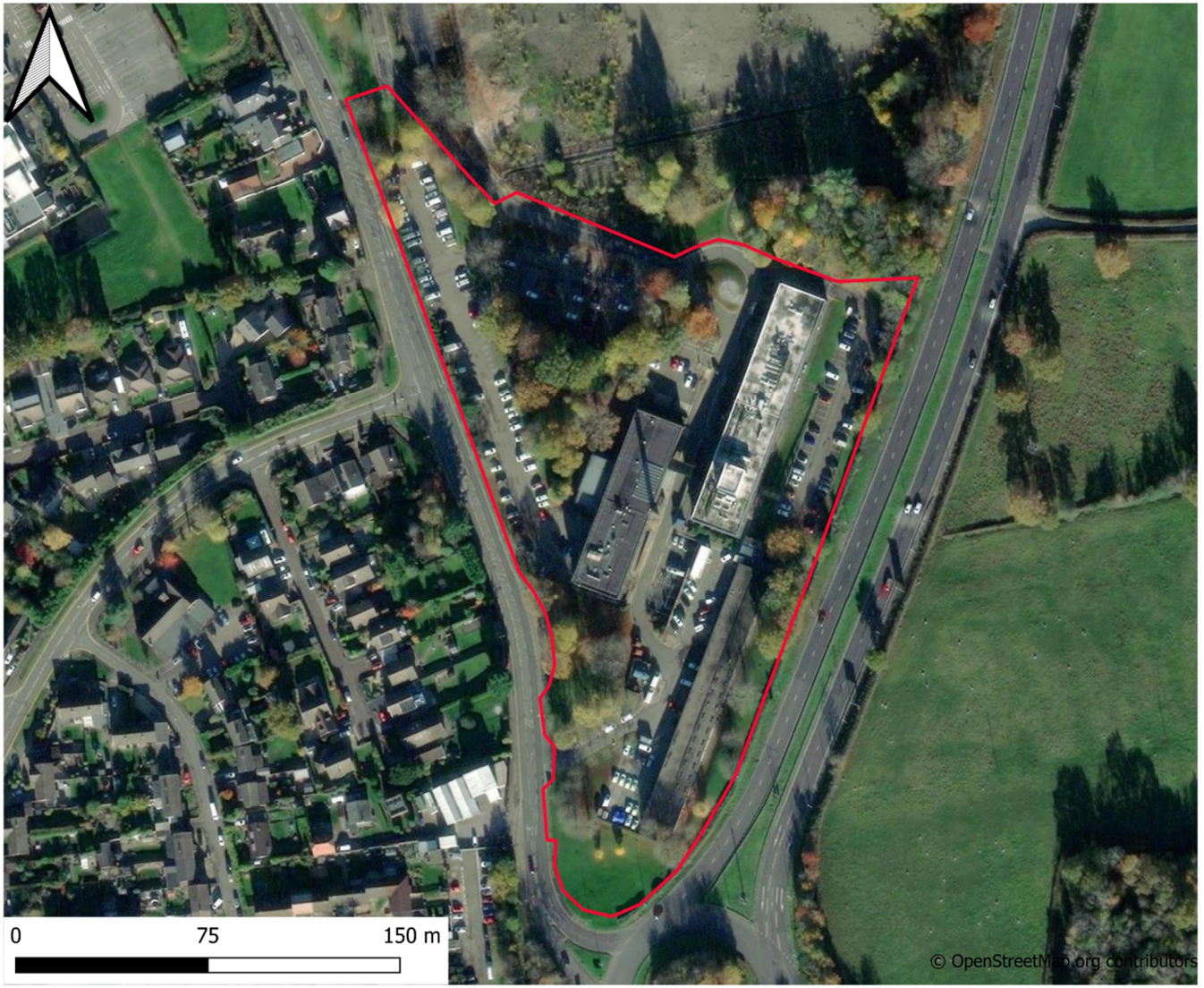
10. Data Collection

PIC Data

The TA will include analysis of highway safety local to the proposed development. This will be informed by PIC data for the study area, shown at **Figure 2-1**. PIC data from the most recently available five-year period will be used. An initial analysis of the publicly available online resource 'Crashmap' shows a total of seven PICs within the vicinity of the proposed development site. All of these incidents occurred at our near Turnpike Roundabout, four of the PICs were classified as 'slight' and two were classified as 'serious'.

The low number of PICs over the five year period suggests there are no existing safety issues in the area local to the site, and the proposed development is unlikely to give rise any issues of safety to highway users. The proposed use of the site could mean shorter attendance times of police officers who are called to such incidents and in this way will work to improve any existing highway safety record. Crashmap does not provide further information beyond the number of vehicles and casualties involved in the PIC and does not state any causation factors. AECOM is certified by the Cyber Essentials Scheme for the use of detailed accident statistics, therefore, if TCBC consider it appropriate to undertake further analysis of the study area, a formal request will be made.

Figure 1-1 Site Location Plan



AECOM

Drawn By:	J. Anderson-Deas
Approved By:	L Van Heezik
Date Drawn:	07.08.2023

Legend:

Proposed Development Boundary

Figure 2-1 Study Area

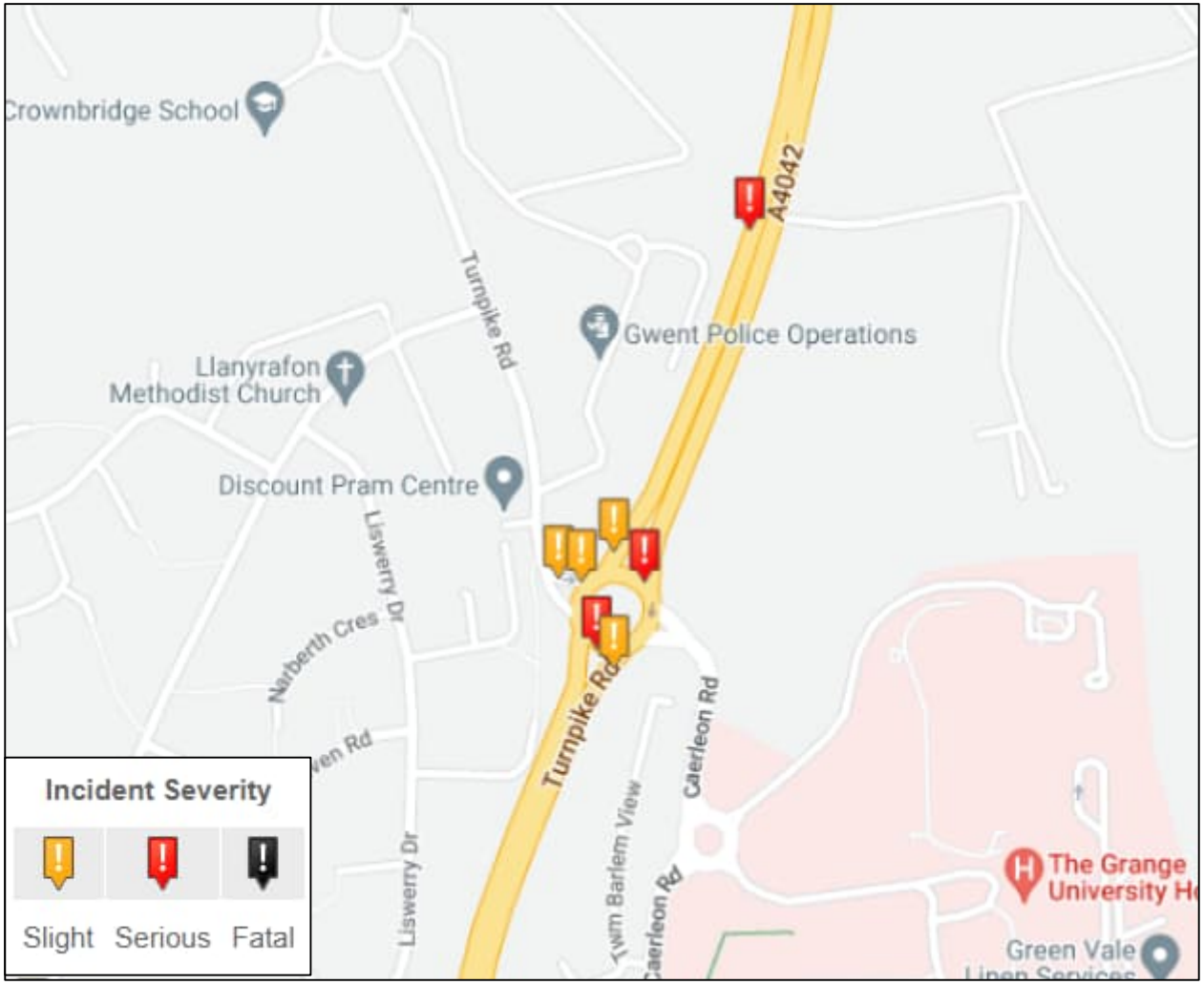


Figure 4-1 Illustrative Masterplan

Appendix B Turnpike Road Roundabout Traffic Survey Data from 23/P/0430/FUL TA

Severnside Transportation Data Collection

SS757 Cwmbran
Thursday 16 June
0700-1000 & 1500-1800
Junction 2

	Arm A - Arm A								Arm A - Arm B								Arm A - Arm C								Arm A - Arm D								Arm Total
	Car	LGV	OGV1	OGV2	PSV	MC	PC	Total	Car	LGV	OGV1	OGV2	PSV	MC	PC	Total	Car	LGV	OGV1	OGV2	PSV	MC	PC	Total	Car	LGV	OGV1	OGV2	PSV	MC	PC	Total	
0700-0715	0	0	0	0	0	0	0	**0**	25	5	0	0	0	0	0	**30**	224	50	2	8	0	5	0	**289**	7	0	0	0	0	1	0	**8**	**327**
0715-0730	0	0	0	0	0	0	0	**0**	52	6	1	0	1	0	0	**60**	267	62	6	1	3	9	0	**348**	9	1	3	0	0	0	0	**13**	**421**
0730-0745	1	0	0	0	0	0	0	**1**	61	14	1	0	0	0	0	**76**	328	58	12	4	0	6	0	**408**	14	1	0	0	0	0	0	**15**	**500**
0745-0800	0	0	0	0	0	0	0	**0**	90	5	0	5	0	1	0	**101**	218	41	6	3	0	5	0	**273**	18	1	1	0	0	0	0	**20**	**394**
Hourly Total	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**228**	**30**	**2**	**5**	**1**	**1**	**0**	**267**	**1037**	**211**	**26**	**16**	**3**	**25**	**0**	**1318**	**48**	**3**	**4**	**0**	**0**	**1**	**0**	**56**	**1642**
0800-0815	1	0	0	0	0	0	0	**1**	92	5	5	0	0	0	0	**102**	327	68	11	3	2	4	0	**415**	20	3	1	0	0	0	0	**24**	**542**
0815-0830	1	0	0	0	0	0	0	**1**	71	10	1	0	1	0	0	**83**	265	38	11	6	1	3	0	**324**	21	1	0	0	1	1	0	**24**	**432**
0830-0845	1	0	0	0	0	0	0	**1**	66	7	2	0	0	0	0	**75**	223	40	14	4	0	9	0	**290**	29	0	1	0	0	0	0	**30**	**396**
0845-0900	1	0	0	0	0	0	0	**1**	64	8	2	0	0	0	0	**74**	191	25	9	9	1	2	0	**237**	20	1	2	0	0	0	0	**23**	**335**
Hourly Total	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**293**	**30**	**10**	**0**	**1**	**0**	**0**	**334**	**1006**	**171**	**45**	**22**	**4**	**18**	**0**	**1266**	**90**	**5**	**4**	**0**	**1**	**1**	**0**	**101**	**1705**
0900-0915	0	0	0	0	0	0	0	**0**	49	3	5	0	0	0	0	**57**	199	38	6	8	0	2	0	**253**	13	2	0	0	0	0	0	**15**	**325**
0915-0930	0	0	0	0	0	0	0	**0**	51	3	2	1	0	1	0	**58**	204	31	7	7	1	2	0	**252**	15	0	1	0	0	0	0	**16**	**326**
0930-0945	0	0	0	0	0	0	0	**0**	37	6	3	0	1	0	0	**47**	160	36	9	4	3	1	0	**213**	14	4	1	0	0	0	0	**19**	**279**
0945-1000	2	0	0	0	0	0	0	**2**	25	5	0	1	0	0	0	**31**	166	30	7	12	0	1	0	**216**	14	2	1	1	0	0	0	**18**	**267**
Hourly Total	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**162**	**17**	**10**	**2**	**1**	**1**	**0**	**193**	**729**	**135**	**29**	**31**	**4**	**6**	**0**	**934**	**56**	**8**	**3**	**1**	**0**	**0**	**0**	**68**	**1197**
3 Hour Totals (am)	7	0	0	0	0	0	0	**7**	683	77	22	7	3	2	0	**794**	2772	517	100	69	11	49	0	**3518**	194	16	11	1	1	2	0	**225**	**4544**
1500-1515	1	0	0	0	0	0	0	**1**	40	2	1	0	0	0	0	**43**	133	30	5	6	1	2	0	**177**	24	1	0	0	3	3	0	**31**	**252**
1515-1530	0	1	0	0	0	0	0	**1**	32	3	1	0	0	1	0	**37**	168	26	3	4	3	5	0	**209**	20	4	0	0	0	0	0	**24**	**271**
1530-1545	0	0	0	0	0	0	0	**0**	36	2	1	0	0	0	0	**39**	168	26	3	4	0	2	0	**203**	17	2	0	0	0	0	0	**19**	**261**
1545-1600	1	0	0	0	0	0	0	**1**	39	7	0	0	0	0	0	**46**	161	35	6	5	2	4	0	**213**	17	2	0	0	0	0	0	**19**	**279**
Hourly Total	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**3**	**147**	**14**	**3**	**0**	**0**	**1**	**0**	**165**	**630**	**117**	**17**	**19**	**6**	**13**	**0**	**802**	**78**	**9**	**0**	**0**	**3**	**3**	**0**	**93**	**1063**
1600-1615	1	0	0	0	0	0	0	**1**	37	7	2	0	0	0	0	**46**	156	41	4	5	1	2	0	**209**	15	1	1	0	0	0	0	**17**	**273**
1615-1630	0	0	0	0	0	0	0	**0**	34	6	1	0	0	1	0	**42**	193	37	3	5	0	1	0	**239**	15	0	0	0	0	0	0	**15**	**296**
1630-1645	1	0	0	0	0	0	0	**1**	35	3	0	0	0	0	0	**38**	190	22	2	2	0	6	0	**222**	10	1	0	0	0	0	0	**11**	**272**
1645-1700	0	0	0	0	0	0	0	**0**	32	3	1	0	0	1	0	**37**	196	23	2	6	0	6	0	**233**	13	1	0	0	0	0	0	**14**	**284**
Hourly Total	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**138**	**19**	**4**	**0**	**0**	**2**	**0**	**163**	**735**	**123**	**11**	**18**	**1**	**15**	**0**	**903**	**53**	**3**	**1**	**0**	**0**	**0**	**0**	**57**	**1125**
1700-1715	1	0	0	0	0	0	0	**1**	30	6	1	0	0	0	0	**37**	224	21	7	2	3	1	0	**258**	6	1	0	0	0	0	0	**7**	**303**
1815-1830	0	0	0	0	0	0	0	**0**	44	8	0	0	0	4	0	**56**	218	20	4	3	0	5	0	**250**	9	2	0	0	0	0	0	**11**	**317**
1730-1745	1	0	0	0	0	0	0	**1**	39	4	0	0	0	0	0	**43**	214	20	3	1	2	4	0	**244**	11	0	0	0	0	0	0	**11**	**299**
1745-1800	1	0	0	0	0	0	0	**1**	48	5	0	0	0	2	0	**55**	148	20	2	5	0	3	0	**178**	17	2	0	0	0	0	0	**19**	**253**
Hourly Total	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**161**	**23**	**1**	**0**	**0**	**6**	**0**	**191**	**804**	**81**	**16**	**11**	**5**	**13**	**0**	**930**	**43**	**5**	**0**	**0**	**0**	**0**	**0**	**48**	**1172**
3 Hour Totals (pm)	7	1	0	0	0	0	0	**8**	446	56	8	0	0	9	0	**519**	2169	321	44	48	12	41	0	**2635**	174	17	1	0	3	3	0	**198**	**3360**
Day Total	14	1	0	0	0	0	0	15	1129	133	30	7	3	11	0	1313	4941	838	144	117	23	90	0	6153	368	33	12	1	4	5	0	423	7904

APPENDIX 4.2
CTC Data (Junction 2)

	Arm B - Arm A								Arm B - Arm B								Arm B - Arm C								Arm B - Arm D								
	Car	LGV	OGV1	OGV2	PSV	MC	PC	Total	Car	LGV	OGV1	OGV2	PSV	MC	PC	Total	Car	LGV	OGV1	OGV2	PSV	MC	PC	Total	Car	LGV	OGV1	OGV2	PSV	MC	PC	Total	Arm Total
0700-0715	30	3	1	0	0	1	0	**35**	0	0	0	0	0	0	0	**0**	32	0	0	0	0	0	0	**32**	10	1	0	0	0	0	0	**11**	**78**
0715-0730	42	2	1	0	0	0	0	**45**	0	0	0	0	0	0	0	**0**	47	0	1	0	0	0	0	**48**	11	2	0	0	1	1	0	**15**	**108**
0730-0745	50	1	0	0	0	0	0	**51**	0	0	0	0	0	0	0	**0**	54	2	0	0	0	0	0	**56**	23	2	1	0	0	0	0	**26**	**133**
0745-0800	36	4	1	0	0	1	0	**42**	0	0	0	0	0	0	0	**0**	42	5	1	2	0	0	0	**50**	15	1	1	0	1	0	0	**18**	**110**
Hourly Total	**158**	**10**	**3**	**0**	**0**	**2**	**0**	**173**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**175**	**7**	**2**	**2**	**0**	**0**	**0**	**186**	**59**	**6**	**2**	**0**	**2**	**1**	**0**	**70**	**429**
0800-0815	44	3	2	0	0	0	0	**49**	0	0	0	0	0	0	0	**0**	27	1	2	0	0	0	0	**30**	22	5	1	0	0	0	0	**28**	**107**
0815-0830	33	2	2	2	1	0	0	**40**	0	0	0	0	0	0	0	**0**	25	3	0	1	0	0	0	**29**	30	0	1	0	1	0	0	**32**	**101**
0830-0845	32	5	4	0	0	0	0	**41**	0	0	0	0	0	0	0	**0**	34	1	5	0	1	0	0	**41**	27	2	0	0	0	0	0	**29**	**111**
0845-0900	30	3	1	0	1	0	0	**35**	0	0	0	0	0	0	0	**0**	17	5	0	0	0	0	0	**22**	17	2	0	0	1	0	0	**20**	**77**
Hourly Total	**139**	**13**	**9**	**2**	**2**	**0**	**0**	**165**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**103**	**10**	**7**	**1**	**1**	**0**	**0**	**122**	**96**	**9**	**2**	**0**	**2**	**0**	**0**	**109**	**396**
0900-0915	24	6	0	0	0	0	0	**30**	0	0	0	0	0	0	0	**0**	23	2	1	2	1	0	0	**29**	19	3	2	0	0	1	0	**25**	**84**
0915-0930	21	2	3	0	0	0	0	**26**	0	0	0	0	0	0	0	**0**	14	1	1	2	0	0	0	**18**	25	2	1	0	1	0	0	**29**	**73**
0930-0945	16	6	2	0	0	2	0	**26**	0	0	0	0	0	0	0	**0**	12	2	0	2	0	0	0	**16**	23	6	1	0	0	0	0	**30**	**72**
0945-1000	23	2	1	0	0	0	0	**26**	0	0	0	0	0	0	0	**0**	21	3	1	0	0	0	0	**25**	17	1	0	0	1	0	1	**20**	**71**
Hourly Total	**84**	**16**	**6**	**0**	**0**	**2**	**0**	**108**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**70**	**8**	**3**	**6**	**1**	**0**	**0**	**88**	**84**	**12**	**4**	**0**	**2**	**1**	**1**	**104**	**300**
3 Hour Totals (am)	381	39	18	2	2	4	0	**446**	0	0	0	0	0	0	0	**0**	348	25	12	9	2	0	0	**396**	239	27	8	0	6	2	1	**283**	**1125**
1500-1515	44	10	0	0	0	2	0	**56**	0	0	0	0	0	0	0	**0**	33	3	0	0	0	0	0	**36**	32	8	1	0	0	1	0	**42**	**134**
1515-1530	46	6	0	0	0	0	0	**52**	0	0	0	0	0	0	0	**0**	35	2	0	0	0	0	0	**37**	32	6	0	0	0	0	0	**38**	**127**
1530-1545	54	5	1	0	0	1	0	**61**	0	0	0	0	0	0	0	**0**	34	1	0	0	0	0	0	**35**	27	2	1	0	0	0	0	**30**	**126**
1545-1600	62	10	2	1	0	0	0	**75**	0	0	0	0	0	0	0	**0**	33	1	2	0	0	0	0	**36**	30	2	0	0	1	0	0	**33**	**144**
Hourly Total	**206**	**31**	**3**	**1**	**0**	**3**	**0**	**244**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**135**	**7**	**2**	**0**	**0**	**0**	**0**	**144**	**121**	**18**	**2**	**0**	**1**	**1**	**0**	**143**	**531**
1600-1615	73	8	1	0	0	0	0	**82**	0	0	0	0	0	0	0	**0**	69	2	0	0	0	0	0	**71**	34	5	1	0	0	1	1	**42**	**195**
1615-1630	57	7	2	0	0	0	0	**66**	0	0	0	0	0	0	0	**0**	36	1	0	0	0	0	0	**37**	27	5	1	0	2	0	1	**36**	**139**
1630-1645	63	11	2	0	0	0	0	**76**	0	0	0	0	0	0	0	**0**	55	2	0	0	0	0	0	**57**	39	4	0	0	0	1	0	**44**	**177**
1645-1700	70	9	0	1	0	0	0	**80**	0	0	0	0	0	0	0	**0**	59	1	1	0	0	0	0	**61**	40	6	0	0	1	1	0	**48**	**189**
Hourly Total	**263**	**35**	**5**	**1**	**0**	**0**	**0**	**304**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**219**	**6**	**1**	**0**	**0**	**0**	**0**	**226**	**140**	**20**	**2**	**0**	**3**	**3**	**2**	**170**	**700**
1700-1715	49	9	0	0	0	1	0	**59**	0	0	0	0	0	0	0	**0**	61	6	0	0	0	0	0	**67**	38	6	0	0	0	1	0	**45**	**171**
1715-1730	54	5	0	0	2	0	0	**61**	0	0	0	0	0	0	0	**0**	58	4	0	0	0	0	0	**62**	46	4	0	0	1	0	0	**51**	**174**
1730-1745	50	5	0	0	0	4	0	**59**	0	0	0	0	0	0	0	**0**	42	2	0	0	0	0	0	**44**	36	1	0	0	0	0	0	**37**	**140**
1745-1800	71	4	0	0	1	0	1	**77**	0	0	0	0	0	0	0	**0**	45	1	0	0	0	1	0	**47**	38	1	0	0	1	0	0	**40**	**164**
Hourly Total	**224**	**23**	**0**	**0**	**3**	**5**	**1**	**256**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**206**	**13**	**0**	**0**	**0**	**1**	**0**	**220**	**158**	**12**	**0**	**0**	**2**	**1**	**0**	**173**	**649**
3 Hour Totals (pm)	693	89	8	2	3	8	1	**804**	0	0	0	0	0	0	0	**0**	560	26	3	0	0	1	0	**590**	419	50	4	0	6	5	2	**486**	**1880**
Day Total	1074	128	26	4	5	12	1	1250	0	0	0	0	0	0	0	0	908	51	15	9	2	1	0	986	658	77	12	0	12	7	3	769	3005

	Arm C - Arm A								Arm C - Arm B								Arm C - Arm C								Arm C - Arm D								
	Car	LGV	OGV1	OGV2	PSV	MC	PC	Total	Car	LGV	OGV1	OGV2	PSV	MC	PC	Total	Car	LGV	OGV1	OGV2	PSV	MC	PC	Total	Car	LGV	OGV1	OGV2	PSV	MC	PC	Total	Arm Total
0700-0715	94	26	9	6	0	0	0	**135**	33	6	3	0	0	0	0	**42**	1	0	0	0	0	0	0	**1**	17	3	0	0	0	0	0	**20**	**198**
0715-0730	125	22	8	5	0	0	0	**160**	52	3	0	0	0	1	0	**56**	1	0	0	0	0	0	0	**1**	19	0	0	0	0	0	0	**19**	**236**
0730-0745	168	32	6	7	1	2	0	**216**	90	2	3	0	0	0	0	**95**	0	0	0	0	0	0	0	**0**	29	2	0	0	0	0	0	**31**	**342**
0745-0800	194	38	9	3	0	1	0	**245**	121	7	4	0	0	0	0	**132**	2	0	0	0	0	0	0	**2**	24	3	2	0	0	0	0	**29**	**408**
Hourly Total	**581**	**118**	**32**	**21**	**1**	**3**	**0**	756	**296**	**18**	**10**	**0**	**0**	**1**	**0**	325	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**89**	**8**	**2**	**0**	**0**	**0**	**0**	99	**1184**
0800-0815	161	34	12	13	0	1	0	**221**	80	2	0	2	0	0	0	**84**	1	0	0	0	0	0	0	**1**	32	5	1	0	0	0	0	**38**	**344**
0815-0830	138	29	5	5	1	2	0	**180**	81	5	1	0	0	0	0	**87**	1	0	0	0	0	0	0	**1**	61	9	1	1	1	0	0	**73**	**341**
0830-0845	150	29	2	11	1	0	0	**193**	87	8	1	2	0	0	0	**98**	3	0	0	0	0	0	0	**3**	53	6	0	0	0	0	0	**59**	**353**
0845-0900	136	34	9	4	0	0	0	**183**	82	9	1	3	0	1	0	**96**	0	0	0	0	0	0	0	**0**	33	3	1	0	0	0	0	**37**	**316**
Hourly Total	**585**	**126**	**28**	**33**	**2**	**3**	**0**	777	**330**	**24**	**3**	**7**	**0**	**1**	**0**	365	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**179**	**23**	**3**	**1**	**1**	**0**	**0**	207	**1354**
0900-0915	111	25	12	8	1	0	0	**157**	49	5	0	0	0	0	0	**54**	0	0	0	0	0	0	0	**0**	19	3	0	0	0	0	0	**22**	**233**
0915-0930	108	39	3	10	0	2	0	**162**	42	6	2	1	0	1	0	**52**	0	0	0	0	0	0	0	**0**	19	5	1	0	0	0	0	**25**	**239**
0930-0945	108	26	8	7	0	1	0	**150**	24	3	2	0	0	0	0	**29**	1	0	0	0	0	0	0	**1**	17	5	0	0	0	0	0	**22**	**202**
0945-1000	108	30	6	7	1	0	0	**152**	41	4	5	1	0	0	0	**51**	0	0	0	0	0	0	0	**0**	26	5	0	0	0	0	0	**31**	**234**
Hourly Total	**435**	**120**	**29**	**32**	**2**	**3**	**0**	621	**156**	**18**	**9**	**2**	**0**	**1**	**0**	186	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**81**	**18**	**1**	**0**	**0**	**0**	**0**	100	**908**
3 Hour Totals (am)	1601	364	89	86	5	9	0	**2154**	782	60	22	9	0	3	0	**876**	10	0	0	0	0	0	0	**10**	349	49	6	1	1	0	0	**406**	**3446**
1500-1515	168	37	7	2	0	8	0	**222**	45	4	1	1	0	1	0	**52**	1	0	0	0	0	0	0	**1**	58	4	1	0	0	0	0	**63**	**338**
1515-1530	175	27	9	10	0	1	0	**222**	53	6	3	1	0	0	0	**63**	1	0	0	0	0	0	0	**1**	31	5	1	0	0	1	0	**38**	**324**
1530-1545	179	44	2	5	1	3	0	**234**	44	2	2	1	0	0	0	**49**	0	0	0	0	0	0	0	**0**	31	7	1	1	0	0	0	**40**	**323**
1545-1600	178	31	6	5	1	2	0	**223**	57	10	2	0	0	0	0	**69**	0	0	0	0	0	0	0	**0**	32	5	0	0	0	0	0	**37**	**329**
Hourly Total	**700**	**139**	**24**	**22**	**2**	**14**	**0**	901	**199**	**22**	**8**	**3**	**0**	**1**	**0**	233	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**152**	**21**	**3**	**1**	**0**	**1**	**0**	178	**1314**
1600-1615	210	43	4	7	1	5	0	**270**	47	4	1	0	1	0	0	**53**	1	0	0	0	0	0	0	**1**	36	5	0	0	0	1	0	**42**	**366**
1615-1630	224	57	7	2	0	8	0	**298**	37	6	0	0	0	2	0	**45**	0	0	0	0	0	0	0	**0**	42	7	0	0	0	1	0	**50**	**393**
1630-1645	239	33	5	7	0	4	0	**288**	45	8	0	0	0	1	0	**54**	1	0	0	0	0	0	0	**1**	37	7	0	0	0	0	0	**44**	**387**
1645-1700	211	27	2	3	0	6	0	**249**	52	1	0	0	0	0	0	**53**	0	0	0	0	0	0	0	**0**	52	7	0	0	0	0	0	**59**	**361**
Hourly Total	**884**	**160**	**18**	**19**	**1**	**23**	**0**	1105	**181**	**19**	**1**	**0**	**1**	**3**	**0**	205	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**167**	**26**	**0**	**0**	**0**	**2**	**0**	195	**1507**
1700-1715	198	32	3	5	0	7	0	**245**	63	4	2	0	0	0	0	**69**	0	0	1	0	0	0	0	**1**	37	8	0	0	0	1	0	**46**	**361**
1815-1830	229	28	1	5	0	2	0	**265**	49	4	1	0	0	0	0	**54**	0	0	0	0	0	0	0	**0**	42	5	0	0	0	1	0	**48**	**367**
1730-1745	213	21	0	0	0	3	0	**237**	57	3	1	0	0	0	0	**61**	0	1	0	0	0	0	0	**1**	35	2	0	0	0	2	0	**39**	**338**
1745-1800	240	19	0	3	2	2	0	**266**	44	2	1	0	0	0	0	**47**	0	0	0	0	0	0	0	**0**	39	6	0	0	0	0	0	**45**	**358**
Hourly Total	**880**	**100**	**4**	**13**	**2**	**14**	**0**	1013	**213**	**13**	**5**	**0**	**0**	**0**	**0**	231	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**2**	**153**	**21**	**0**	**0**	**0**	**4**	**0**	178	**1424**
3 Hour Totals (pm)	2464	399	46	54	5	51	0	**3019**	593	54	14	3	1	4	0	**669**	4	1	1	0	0	0	0	**6**	472	68	3	1	0	7	0	**551**	**4245**
Day Total	4065	763	135	140	10	60	0	5173	1375	114	36	12	1	7	0	1545	14	1	1	0	0	0	0	16	821	117	9	2	1	7	0	957	7691

	Arm D - Arm A								Arm D - Arm B								Arm D - Arm C								Arm D - Arm D								
	Car	LGV	OGV1	OGV2	PSV	MC	PC	Total	Car	LGV	OGV1	OGV2	PSV	MC	PC	Total	Car	LGV	OGV1	OGV2	PSV	MC	PC	Total	Car	LGV	OGV1	OGV2	PSV	MC	PC	Total	Arm Total
0700-0715	2	0	0	0	0	0	0	**2**	13	2	0	0	2	0	0	**17**	37	4	0	0	0	0	0	**41**	0	0	0	0	0	0	0	**0**	**60**
0715-0730	2	0	1	0	0	0	0	**3**	16	2	0	0	0	0	0	**18**	32	6	1	0	0	1	0	**40**	0	0	0	0	0	0	0	**0**	**61**
0730-0745	5	3	0	0	0	0	0	**8**	21	3	2	0	1	1	0	**28**	40	9	0	0	0	1	0	**50**	1	0	0	0	0	0	0	**1**	**87**
0745-0800	12	0	0	0	0	1	0	**13**	31	7	0	0	0	0	0	**38**	38	7	0	0	0	0	0	**45**	0	0	0	0	0	0	0	**0**	**96**
Hourly Total	**21**	**3**	**1**	**0**	**0**	**1**	**0**	**26**	**81**	**14**	**2**	**0**	**3**	**1**	**0**	**101**	**147**	**26**	**1**	**0**	**0**	**2**	**0**	**176**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**304**
0800-0815	7	0	0	0	0	0	0	**7**	23	4	1	0	1	0	0	**29**	41	10	1	0	0	0	0	**52**	0	0	0	0	0	0	0	**0**	**88**
0815-0830	17	0	0	0	0	0	0	**17**	20	4	1	0	0	0	0	**25**	53	7	0	0	0	0	0	**60**	0	0	0	0	0	0	0	**0**	**102**
0830-0845	12	1	0	0	0	4	0	**17**	28	6	0	0	1	0	0	**35**	62	12	1	0	0	1	0	**76**	0	0	0	0	0	0	0	**0**	**128**
0845-0900	17	1	0	0	1	0	0	**19**	22	3	0	0	0	0	0	**25**	34	5	2	0	0	0	0	**41**	0	0	0	0	0	0	0	**0**	**85**
Hourly Total	**53**	**2**	**0**	**0**	**1**	**4**	**0**	**60**	**93**	**17**	**2**	**0**	**2**	**0**	**0**	**114**	**190**	**34**	**4**	**0**	**0**	**1**	**0**	**229**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**403**
0900-0915	12	0	1	1	0	1	0	**15**	26	1	0	0	0	0	0	**27**	22	4	0	0	1	0	0	**27**	0	0	0	0	0	0	0	**0**	**69**
0915-0930	11	0	0	0	0	0	0	**11**	28	7	0	0	1	0	0	**36**	32	6	0	0	0	3	0	**41**	0	0	0	0	0	0	0	**0**	**88**
0930-0945	15	1	0	0	0	1	0	**17**	19	5	0	0	1	0	0	**25**	25	8	0	0	0	0	0	**33**	0	0	0	0	0	0	0	**0**	**75**
0945-1000	4	3	1	0	0	0	0	**8**	19	3	2	0	0	0	0	**24**	12	5	0	1	0	0	0	**18**	0	0	0	0	0	0	0	**0**	**50**
Hourly Total	**42**	**4**	**2**	**1**	**0**	**2**	**0**	**51**	**92**	**16**	**2**	**0**	**2**	**0**	**0**	**112**	**91**	**23**	**0**	**1**	**1**	**3**	**0**	**119**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**282**
3 Hour Totals (am)	116	9	3	1	1	7	0	**137**	266	47	6	0	7	1	0	**327**	428	83	5	1	1	6	0	**524**	1	0	0	0	0	0	0	**1**	**989**
1500-1515	25	4	0	0	0	0	0	**29**	26	5	0	0	1	0	0	**32**	48	2	0	0	0	1	0	**51**	0	0	0	0	0	0	0	**0**	**112**
1515-1530	18	1	0	0	0	0	0	**19**	32	1	1	0	0	0	0	**34**	51	2	1	0	0	0	0	**54**	0	0	0	0	0	0	0	**0**	**107**
1530-1545	24	0	0	0	1	1	0	**26**	27	4	0	0	0	1	0	**32**	50	4	1	0	0	0	0	**55**	0	0	0	0	0	0	0	**0**	**113**
1545-1600	10	1	0	0	0	0	0	**11**	27	2	1	0	0	2	0	**32**	27	3	0	0	0	0	0	**30**	0	0	0	0	0	0	0	**0**	**73**
Hourly Total	**77**	**6**	**0**	**0**	**1**	**1**	**0**	**85**	**112**	**12**	**2**	**0**	**1**	**3**	**0**	**130**	**176**	**11**	**2**	**0**	**0**	**1**	**0**	**190**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**405**
1600-1615	23	1	0	0	1	2	0	**27**	35	6	0	0	1	0	0	**42**	32	6	0	0	0	0	0	**38**	0	0	0	0	0	0	0	**0**	**107**
1615-1630	7	0	0	0	0	0	0	**7**	34	1	0	0	0	0	0	**35**	38	4	0	0	0	0	0	**42**	0	0	0	0	0	0	0	**0**	**84**
1630-1645	3	2	0	0	0	0	0	**5**	36	4	0	0	1	1	0	**42**	27	4	0	0	0	1	0	**32**	0	0	0	0	0	0	0	**0**	**79**
1645-1700	7	0	0	0	0	1	0	**8**	42	1	0	0	0	0	0	**43**	27	3	0	0	0	0	0	**30**	0	0	0	0	0	0	0	**0**	**81**
Hourly Total	**40**	**3**	**0**	**0**	**1**	**3**	**0**	**47**	**147**	**12**	**0**	**0**	**2**	**1**	**0**	**162**	**124**	**17**	**0**	**0**	**0**	**1**	**0**	**142**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**351**
1700-1715	5	0	0	0	0	0	0	**5**	36	1	0	0	1	0	2	**40**	29	2	0	0	0	0	0	**31**	0	0	0	0	0	0	0	**0**	**76**
1815-1830	7	0	0	0	0	0	0	**7**	35	1	0	0	0	0	0	**36**	21	5	0	0	0	0	0	**26**	0	0	0	0	0	0	0	**0**	**69**
1730-1745	8	0	0	0	0	0	0	**8**	29	1	0	0	1	0	0	**31**	33	5	0	0	0	0	0	**38**	0	0	0	0	0	0	0	**0**	**77**
1745-1800	10	0	0	0	0	0	0	**10**	26	1	0	0	0	0	0	**27**	22	3	0	0	0	1	0	**26**	0	0	0	0	0	0	0	**0**	**63**
Hourly Total	**30**	**0**	**0**	**0**	**0**	**0**	**0**	**30**	**126**	**4**	**0**	**0**	**2**	**0**	**2**	**134**	**105**	**15**	**0**	**0**	**0**	**1**	**0**	**121**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**285**
3 Hour Totals (pm)	147	9	0	0	2	4	0	**162**	385	28	2	0	5	4	2	**426**	405	43	2	0	0	3	0	**453**	0	0	0	0	0	0	0	**0**	**1041**
Day Total	263	18	3	1	3	11	0	299	651	75	8	0	12	5	2	753	833	126	7	1	1	9	0	977	1	0	0	0	0	0	0	1	2030

	Origin - Arm A								Origin - Arm B								Origin - Arm C								Origin - Arm D								
	Car	LGV	OGV1	OGV2	PSV	MC	PC	Total	Car	LGV	OGV1	OGV2	PSV	MC	PC	Total	Car	LGV	OGV1	OGV2	PSV	MC	PC	Total	Car	LGV	OGV1	OGV2	PSV	MC	PC	Total	Arm Total
0700-0715	256	55	2	8	0	6	0	**327**	72	4	1	0	0	1	0	**78**	145	35	12	6	0	0	0	**198**	52	6	0	0	2	0	0	**60**	**663**
0715-0730	328	69	10	1	4	9	0	**421**	100	4	2	0	1	1	0	**108**	197	25	8	5	0	1	0	**236**	50	8	2	0	0	1	0	**61**	**826**
0730-0745	404	73	13	4	0	6	0	**500**	127	5	1	0	0	0	0	**133**	287	36	9	7	1	2	0	**342**	67	15	2	0	1	2	0	**87**	**1062**
0745-0800	326	47	7	8	0	6	0	**394**	93	10	3	2	1	1	0	**110**	341	48	15	3	0	1	0	**408**	81	14	0	0	0	1	0	**96**	**1008**
Hourly Total	**1314**	**244**	**32**	**21**	**4**	**27**	**0**	**1642**	**392**	**23**	**7**	**2**	**2**	**3**	**0**	**429**	**970**	**144**	**44**	**21**	**1**	**4**	**0**	**1184**	**250**	**43**	**4**	**0**	**3**	**4**	**0**	**304**	**3559**
0800-0815	440	76	17	3	2	4	0	**542**	93	9	5	0	0	0	0	**107**	274	41	13	15	0	1	0	**344**	71	14	2	0	1	0	0	**88**	**1081**
0815-0830	358	49	12	6	3	4	0	**432**	88	5	3	3	2	0	0	**101**	281	43	7	6	2	2	0	**341**	90	11	1	0	0	0	0	**102**	**976**
0830-0845	319	47	17	4	0	9	0	**396**	93	8	9	0	1	0	0	**111**	293	43	3	13	1	0	0	**353**	102	19	1	0	1	5	0	**128**	**988**
0845-0900	276	34	13	9	1	2	0	**335**	64	10	1	0	2	0	0	**77**	251	46	11	7	0	1	0	**316**	73	9	2	0	1	0	0	**85**	**813**
Hourly Total	**1393**	**206**	**59**	**22**	**6**	**19**	**0**	**1705**	**338**	**32**	**18**	**3**	**5**	**0**	**0**	**396**	**1099**	**173**	**34**	**41**	**3**	**4**	**0**	**1354**	**336**	**53**	**6**	**0**	**3**	**5**	**0**	**403**	**3858**
0900-0915	261	43	11	8	0	2	0	**325**	66	11	3	2	1	1	0	**84**	179	33	12	8	1	0	0	**233**	60	5	1	1	1	1	0	**69**	**711**
0915-0930	270	34	10	8	1	3	0	**326**	60	5	5	2	1	0	0	**73**	169	50	6	11	0	3	0	**239**	71	13	0	0	1	3	0	**88**	**726**
0930-0945	211	46	13	4	4	1	0	**279**	51	14	3	2	0	2	0	**72**	150	34	10	7	0	1	0	**202**	59	14	0	0	1	1	0	**75**	**628**
0945-1000	207	37	8	14	0	1	0	**267**	61	6	2	0	1	0	1	**71**	175	39	11	8	1	0	0	**234**	35	11	3	1	0	0	0	**50**	**622**
Hourly Total	**949**	**160**	**42**	**34**	**5**	**7**	**0**	**1197**	**238**	**36**	**13**	**6**	**3**	**3**	**1**	**300**	**673**	**156**	**39**	**34**	**2**	**4**	**0**	**908**	**225**	**43**	**4**	**2**	**3**	**5**	**0**	**282**	**2687**
3 Hour Totals (am)	3656	610	133	77	15	53	0	**4544**	968	91	38	11	10	6	1	**1125**	2742	473	117	96	6	12	0	**3446**	811	139	14	2	9	14	0	**989**	**10104**
1500-1515	198	33	6	6	4	5	0	**252**	109	21	1	0	0	3	0	**134**	272	45	9	3	0	9	0	**338**	99	11	0	0	1	1	0	**112**	**836**
1515-1530	220	34	4	4	3	6	0	**271**	113	14	0	0	0	0	0	**127**	260	38	13	11	0	2	0	**324**	101	4	2	0	0	0	0	**107**	**829**
1530-1545	221	30	4	4	0	2	0	**261**	115	8	2	0	0	1	0	**126**	254	53	5	7	1	3	0	**323**	101	8	1	0	1	2	0	**113**	**823**
1545-1600	218	44	6	5	2	4	0	**279**	125	13	4	1	1	0	0	**144**	267	46	8	5	1	2	0	**329**	64	6	1	0	0	2	0	**73**	**825**
Hourly Total	**857**	**141**	**20**	**19**	**9**	**17**	**0**	**1063**	**462**	**56**	**7**	**1**	**1**	**4**	**0**	**531**	**1053**	**182**	**35**	**26**	**2**	**16**	**0**	**1314**	**365**	**29**	**4**	**0**	**2**	**5**	**0**	**405**	**3313**
1600-1615	209	49	7	5	1	2	0	**273**	176	15	2	0	0	1	1	**195**	294	52	5	7	2	6	0	**366**	90	13	0	0	2	2	0	**107**	**941**
1615-1630	242	43	4	5	0	2	0	**296**	120	13	3	0	2	0	1	**139**	303	70	7	2	0	11	0	**393**	79	5	0	0	0	0	0	**84**	**912**
1630-1645	236	26	2	2	0	6	0	**272**	157	17	2	0	0	1	0	**177**	322	48	5	7	0	5	0	**387**	66	10	0	0	1	2	0	**79**	**915**
1645-1700	241	27	3	6	0	7	0	**284**	169	16	1	1	1	1	0	**189**	315	35	2	3	0	6	0	**361**	76	4	0	0	0	1	0	**81**	**915**
Hourly Total	**928**	**145**	**16**	**18**	**1**	**17**	**0**	**1125**	**622**	**61**	**8**	**1**	**3**	**3**	**2**	**700**	**1234**	**205**	**19**	**19**	**2**	**28**	**0**	**1507**	**311**	**32**	**0**	**0**	**3**	**5**	**0**	**351**	**3683**
1700-1715	261	28	8	2	3	1	0	**303**	148	21	0	0	0	2	0	**171**	298	44	6	5	0	8	0	**361**	70	3	0	0	1	0	2	**76**	**911**
1815-1830	271	30	4	3	0	9	0	**317**	158	13	0	0	3	0	0	**174**	320	37	2	5	0	3	0	**367**	63	6	0	0	0	0	0	**69**	**927**
1730-1745	265	24	3	1	2	4	0	**299**	128	8	0	0	0	4	0	**140**	305	27	1	0	0	5	0	**338**	70	6	0	0	1	0	0	**77**	**854**
1745-1800	214	27	2	5	0	5	0	**253**	154	6	0	0	2	1	1	**164**	323	27	1	3	2	2	0	**358**	58	4	0	0	0	1	0	**63**	**838**
Hourly Total	**1011**	**109**	**17**	**11**	**5**	**19**	**0**	**1172**	**588**	**48**	**0**	**0**	**5**	**7**	**1**	**649**	**1246**	**135**	**10**	**13**	**2**	**18**	**0**	**1424**	**261**	**19**	**0**	**0**	**2**	**1**	**2**	**285**	**3530**
3 Hour Totals (pm)	2796	395	53	48	15	53	0	**3360**	1672	165	15	2	9	14	3	**1880**	3533	522	64	58	6	62	0	**4245**	937	80	4	0	7	11	2	**1041**	**10526**
Day Total	6452	1005	186	125	30	106	0	7904	2640	256	53	13	19	20	4	3005	6275	995	181	154	12	74	0	7691	1748	219	18	2	16	25	2	2030	20630

Appendix C Accessibility Index Calculation

BREEAM 2018 Tra01/02 Accessibility Index calculator

BREEAM UK delivered by bre

Using the drop down boxes make the relevant selections and press the 'Select' button

Building type: Other building type 1

No. nodes required: 3

Select

Police Headquarters

Public transport type	Bus									
Distance to node (m)	180									
	Service 1	Service 2	Service 3	Service 4	Service 5	Service 6	Service 7	Service 8	Service 9	Service 10
Average frequency per hour	1.1									

Methodist Church (Llan Yr Avon Way)

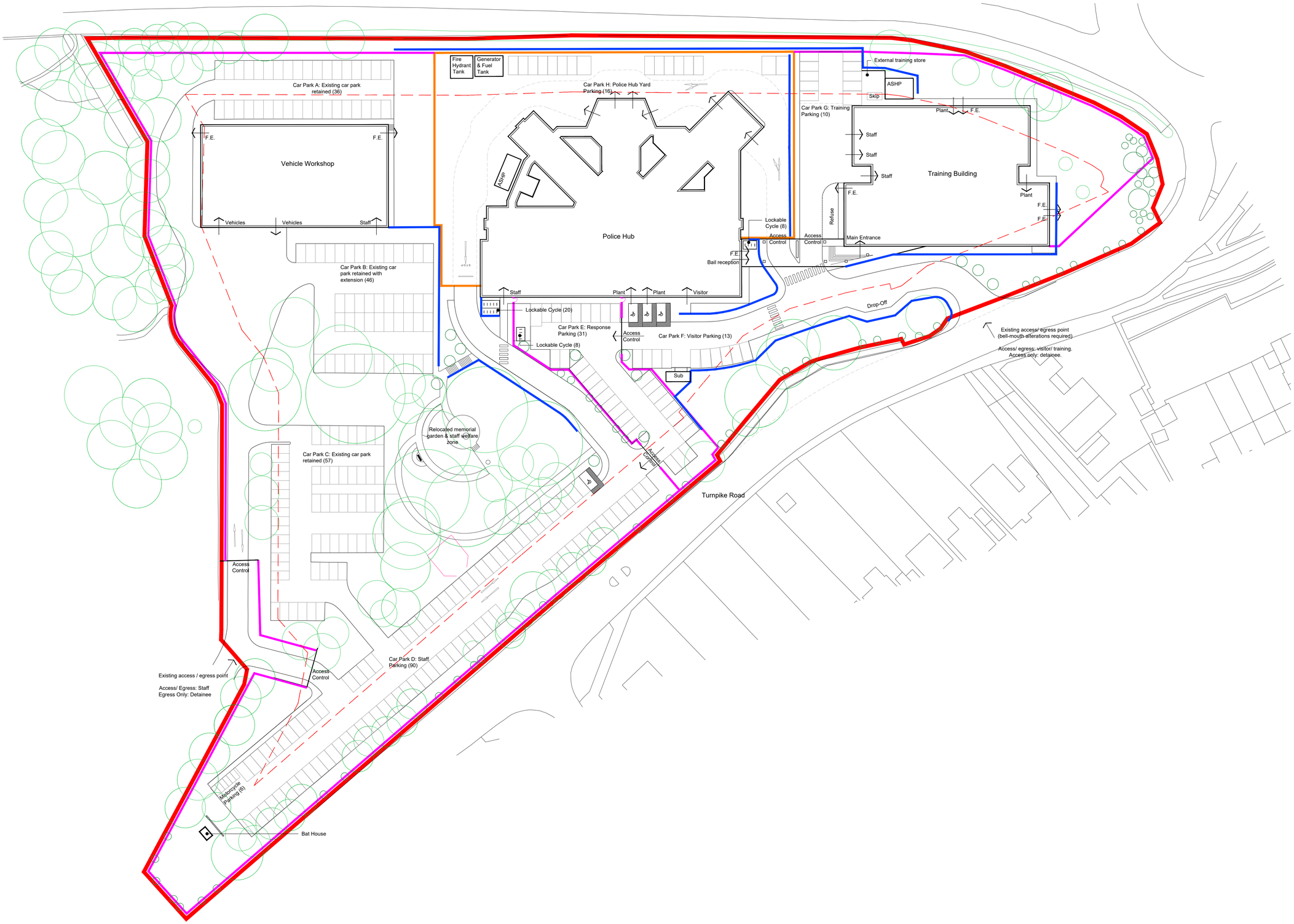
Public transport type	Bus									
Distance to node (m)	400									
	Service 1	Service 2	Service 3	Service 4	Service 5	Service 6	Service 7	Service 8	Service 9	Service 10
Average frequency per hour	0.1									

Methodist Church (Liswerry Drive)

Public transport type	Bus									
Distance to node (m)	500									
	Service 1	Service 2	Service 3	Service 4	Service 5	Service 6	Service 7	Service 8	Service 9	Service 10
Average frequency per hour	0.6									

Accessibility Index	1.26

Appendix D Proposed Site Layout Plan



NORTH

0 5.0 10.0 15.0 20.0 25.0 50.0m

Rev.	Description	Date	Drw.	Chk.
P-02	Deck car park removed. Vehicle workshop adjusted to maintain existing car parks. R.W. positions updated.	13.08.23	EHC	SC
P-01	First Issue	02.05.23	EHC	SC

Key

- Site boundary
- 15m stand off
- 2.0m anti-climb weldmesh
- 3.0m anti-climb weldmesh
- Retaining walls (type tbc)
- Existing trees
- Proposed trees
- Building access
- EV Parking Spaces (New)
- EV Parking Spaces (Existing)
- Parking Spaces (New)
- Parking Spaces (Existing)

Client: Willmott Dixon

Project: Gwent Police Operational Facility

Drawing Title: Proposed Site Plan

Drawing Status: PLANNING

Corstorphine & Wright
Warwick Studio
Brook Hall, Brook Street, Warwick, CV34 4BL
01926 658 444
corstorphine-wright.com

Drawing No.	Revision
GPOF-CWA-04-XX-DR-A-0300	P-02

Drawn	Checked	Paper Size	Scale	Date
SS	EHC	A1	1:500	02.05.2023

Appendix E Vehicle Swept Path Analysis (SPA) and Junction Visibility Splays

Filename: L:\LEGACY\UKBRI2FP001\VOL1TP\PROJECTS\DEVELOPMENT PLANNING\CARDIFF OFFICE WORK\GWENT POLICE OPERATIONAL FACILITY, CWMBRAN\CAD\02_SHEETS\GPOF SITE PLAN - GENERAL ARRANGEMENT - AECOM SPA 14.08.23.DWG Last saved by: BENJAMIN.BURTON1 Last Plotted: 8/18/2023 12:04 PM

Project Management Initials: Designer: BB Checked: SP Approved: SP

A3 297x420mm

SPA - Custody Vehicle

Car Park A: Existing car park retained (36)

Fire Hydrant Tank

Generator & Fuel Tank

Car Park H: Police Hub Yard Parking (16)

External training store

ASHP

Skip

Car Park G: Training Parking (10)

Plant

F.E.

Staff

Staff

Staff

Training Building

F.E.

Plant

F.E.

F.E.

F.E.

Vehicle Workshop

F.E.

F.E.

Vehicles

Vehicles

Staff

ASHP

Police Hub

Lockable Cycle (8)

Access Control

Refuse

Access Control

Main Entrance

F.E.

Bail reception

Car Park B: Existing car park retained with extension (46)

Staff

Plant

Plant

Visitor

Drop-Off

Lockable Cycle (20)

Car Park E: Response Parking (31)

Access Control

Car Park F: Visitor Parking (13)

Existing access/ egress point (bell-mouth alterations required)

Access/ egress: visitor/ training. Access only: detainee.

Lockable Cycle (8)

Sub

Shelter

Relocated memorial garden & staff welfare zone

Car Park C: Existing car park retained (57)

Access Control

Turnpike Road

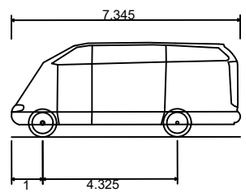
Access Control

Access Control

Car Park D: Staff Parking (90)

Existing access / egress point

Access/ Egress: Staff Egress Only: Detainee



Mercedes Sprinter Panel Van 518CDI Extra Long Super High Roof	
Overall Length	7.345m
Overall Width	1.993m
Overall Body Height	3.030m
Min Body Ground Clearance	0.400m
Track Width	1.993m
Lock to lock time	5.00s
Wall to Wall Turning Radius	7.800m

Gwent Police Operational Facility, Cwmbran

Proposed Site Layout Review

FOR INFORMATION ONLY

AECOM

Filename: L:\LEGACY\UKBRI2FP001\VOL1TP\PROJECTS\DEVELOPMENT PLANNING\CARDIFF OFFICE WORK\GWENT POLICE OPERATIONAL FACILITY, CWMBRAN\CAD\02_SHEETS\GPOF SITE PLAN - GENERAL ARRANGEMENT - AECOM SPA 14.08.23.DWG Last saved by: BENJAMIN.BURTON1 Last Plotted: 8/18/2023 12:04 PM

Project Management Initials: Designer: BB Checked: SP Approved: SP

A3 297x420mm

SPA - Skip Lorry - Training Yard

External training store

ASHP

Skip

Skip lorry accesses designated area, before completing turning manoeuvre, requiring a minimum of three vacant spaces to access the skip.

Car Park G: Training Parking (10)

Plant

Staff

Staff

Staff

Training Building

F.E.

Plant

F.E.

F.E.

Refuse

Lockable Cycle (8)

Access Control

Access Control

Main Entrance

F.E.

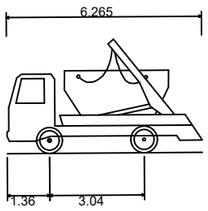
Bail reception

Drop-Off

Small Skip Lorry

Existing access/ egress point (bell-mouth alterations required)

Access/ egress: visitor/ training.
Access only: detainee.



Small Skip Lorry	
Overall Length	6.265m
Overall Width	2.390m
Overall Body Height	3.650m
Min Body Ground Clearance	0.396m
Max Track Width	2.435m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	6.340m

Gwent Police Operational Facility, Cwmbran

Proposed Site Layout Review

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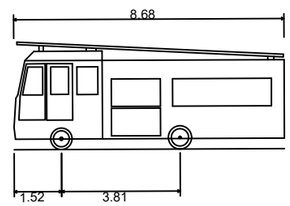
Project Management Initials: Designer: BB Checked: SP Approved: SP

A3 297x420mm

SPA - Fire Appliance

Fire Hydrant Tank
Generator & Fuel Tank
Car Park A: Existing car park retained (36)
Car Park H: Police Hub Yard Parking (16)
External training store
ASHP
Skip
Car Park G: Training Parking (10)
Plant
F.E.
Staff
Staff
Staff
Training Building
F.E.
Plant
F.E.
F.E.
Refuse
Lockable Cycle (8)
Access Control
Main Entrance
Vehicle Workshop
F.E.
F.E.
Vehicles
Vehicles
Staff
ASHP
Police Hub
F.E.
Bail reception
Car Park B: Existing car park retained with extension (46)
Staff
Plant
Plant
Visitor
Lockable Cycle (20)
Drop-Off
Car Park E: Response Parking (31)
Access Control
Car Park F: Visitor Parking (13)
Lockable Cycle (8)
Sub
Shelter
Existing access/ egress point (bell mount alterations required)
Access/ egress: visitor/ training. Access only: detainee.
Relocated memorial garden & staff welfare zone
Car Park C: Existing car park retained (57)
Access Control
Turnpike Road
Access Control
Car Park D: Staff Parking (90)
Access Control
Existing access / egress point
Access/ Egress: Staff
Egress Only: Detainee



DB32 Fire Appliance	
Overall Length	8.680m
Overall Width	2.180m
Overall Body Height	3.452m
Min Body Ground Clearance	0.337m
Max Track Width	2.121m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	7.910m

Gwent Police Operational Facility, Cwmbran

Proposed Site Layout Review

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Project Management Initials: Designer: BB Checked: SP Approved: SP

A3 297x420mm

SPA - Large Refuse Vehicle

ASHP

Skip

Car Park G: Training Parking (10)

Plant

F.E.

Staff

Staff

Staff

Training Building

Refuse vehicle performs reverse manoeuvre to access servicing layby, before exiting the site in a forward gear.

F.E.

F.E.

F.E.

Refuse

Lockable Cycle (8)

Access Control

Access Control

Main Entrance

F.E.

Bail reception

Plant

Visitor

Drop-Off

Large Refuse Vehicle (4 axle)

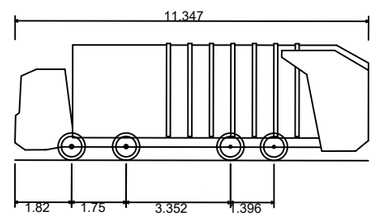
Existing access/ egress point (bell-mouth alterations required)

Access/ egress: visitor/ training.
Access only: detainee.

Car Park F: Visitor Parking (13)

Sub

Shelter



Large Refuse Vehicle (4 axle)	
Overall Length	11.347m
Overall Width	2.500m
Overall Body Height	3.751m
Min Body Ground Clearance	0.304m
Track Width	2.500m
Lock to lock time	6.00s
Wall to Wall Turning Radius	11.330m

Gwent Police Operational Facility, Cwmbran

Proposed Site Layout Review

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Project Management Initials: Designer: BB Checked: SP Approved: SP

A3 297x420mm

SPA - Large Car (Parking)

Car Park B: Existing car park retained with extension (46)

Bail reception

Staff

Plant

Plant

Visitor

Lockable Cycle (20)

Car Park E: Response Parking (31)

Access Control

Lockable Cycle (8)

Car Park E: Visitor Parking (13)

Drop-Off

Existing acce
(bell-mouth alt

Access/ egres
Access o

Sub

Shelter

Relocated memorial garden & staff welfare zone

Car Park C: Existing car park retained (57)

Access Control

Turnpike Road

Access Control

Car Park D: Staff Parking (90)

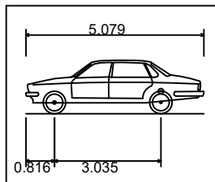
Access Control

Existing access / egress point

Access/ Egress: Staff Egress Only: Detainee

Motorcycle Parking (6)

Bat House



Large Car (2006)	
Overall Length	5.079m
Overall Width	1.872m
Overall Body Height	1.525m
Min Body Ground Clearance	0.310m
Max Track Width	1.831m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	5.900m

Gwent Police Operational Facility, Cwmbran

Proposed Site Layout Review

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AECOM

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Project Management Initials: Designer: BB Checked: SP Approved: SP

A3 297x420mm

Turnpike Road Access Junction - Visibility Splays

Staff

Staff

Staff

Training Building

F.E.

Plant

F.E.

F.E.

Refuse

Access Control

Main Entrance

Drop-Off

Existing access/ egress point (bell-mouth alterations required)

Access only: detainee.

Visibility splay shown up to the splitter island for Turnpike Roundabout, approx. 57m length.

Visibility splays set back 2.4m from the carriageway.

Visibility splay provided up to 43m to the right of the site access, as per requirements for a 30mph speed limit.

Key:

Visibility Splay

Area to be kept clear of obstructions

Gwent Police Operational Facility, Cwmbran

Turnpike Road Access Junction - Visibility Splays

FOR INFORMATION ONLY

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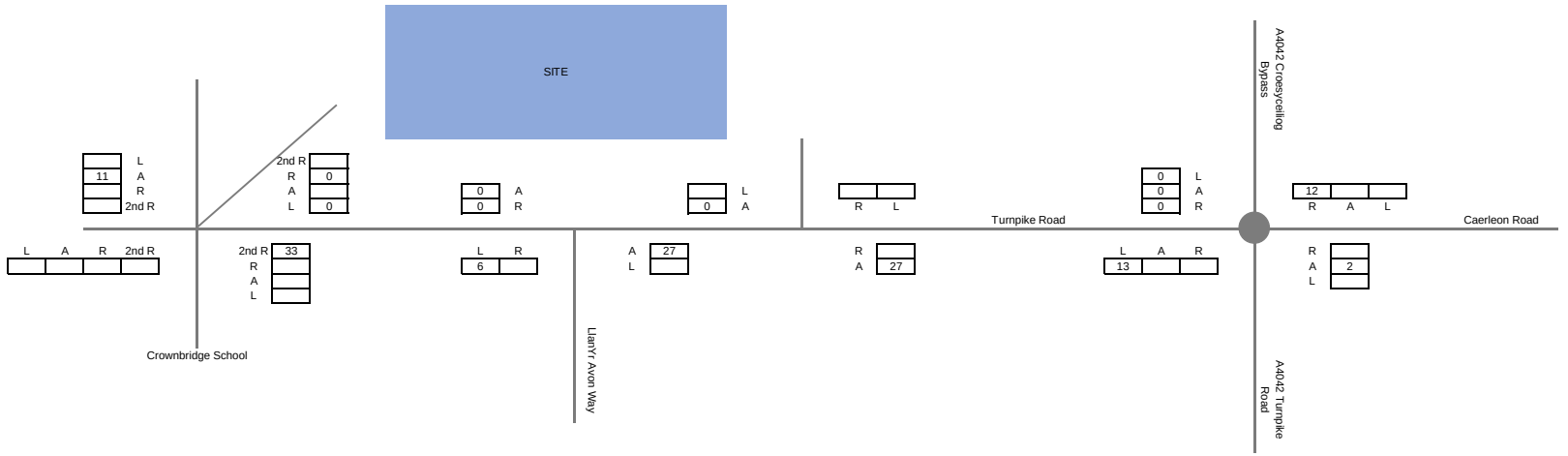
Appendix F Staff Information from Gwent Police

Parking and Resources for Gwent Police Operational Facility

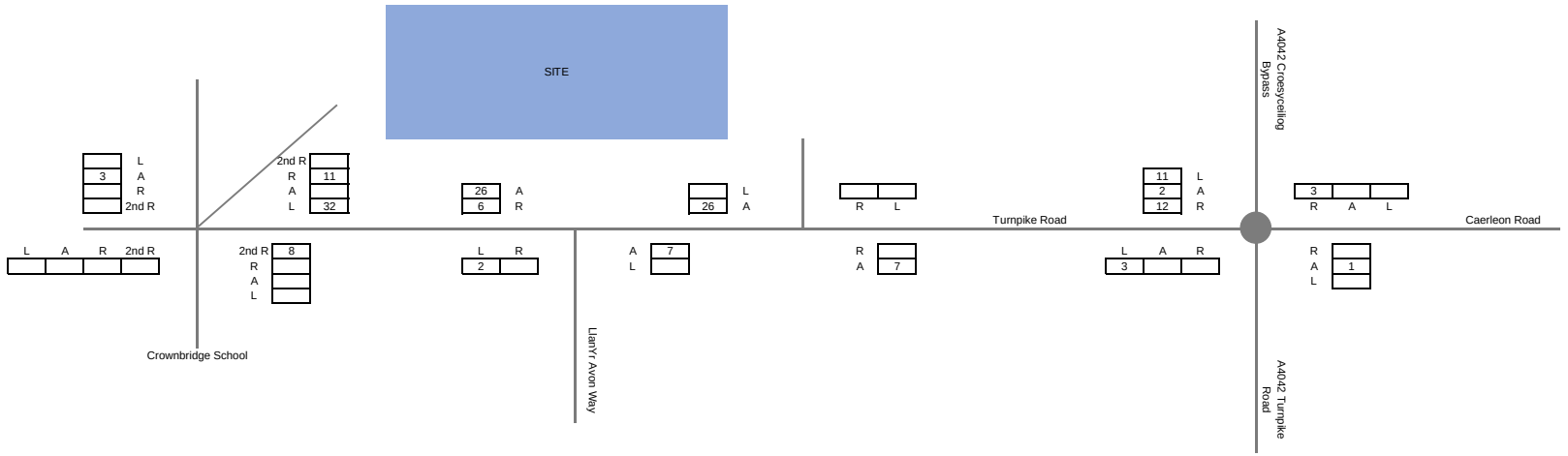
Team	Dept	Total Staff No's	Shifts	Shift pattern	Working Hours	Resource breakdown
Team 1	Role 1	68	Yes	12hr shifts	0700-1900 and 1900 to 0700	Each shift consists of 14 officers and staff and 1 Health Care Professional
	Role 2	3	Yes	9hr shifts	0700-1700/12-2100/0900-1800	2 x 07:00-17:00, 2 x 12:00-21:00, 1 x 09:00-18:00
	Role 3	3	No	N/A	0800-1600	Monday to Friday.
	Role 4	2	Yes	9hr shifts	0700-1600/1300-2200/0900-1800	2 x 07:00-16:00, 2 x 13:00-22:00, 1 x 09:00-18:00
Team 2	Role 1	1	No		0800-1600	
	Role 2	1	No		0800-1600	
	Role 3	6	Yes	Yes	0700-1700/1000-1800/1700-0200	
	Role 4	36	Yes	Yes	0700-1700/1000-1800/1700-0200	5 teams approx 7 resources per team and shift
Team 3	Role 1	3	No		0800-1600	
	Role 2	6	Yes		0700-1700/12-2100/0900-1800	
	Role 3	11	Yes		0700-1700/12-2100/0900-1800	
	Role 4	124	Yes		0700-1700/12-2100/0900-1800	Spread across 5 teams
	Role 5	28	Yes		0700-1700/12-2100/0900-1800	Spread across 5 teams
	Role 6	15	Yes		0700-1700/12-2100/0900-1800	Spread across 5 teams
Team 4	Role 1	1	No		0800-1600	
	Role 2	1	No		0800-1600	
	Role 3	1	No		0800-1600	
	Role 4	1	No		0800-1600	
	Role 5	21	No		0800-1600	
	Role 6	2.5	No		0800-1600	
	Role 7	0.5	No		0800-1600	
Team 5	Role 1	1	No		0800-1600	
	Role 2	1	No		0800-1600	
	Role 3	1	No		0800-1600	
	Role 4	1	No		0800-1600	
	Role 5	4	No		0800-1600	
	Role 6	1	No		0800-1600	
	Role 7	3	No		0800-1600	
	Role 8	1	No		0800-1600	

Appendix G Traffic Flow Diagrams



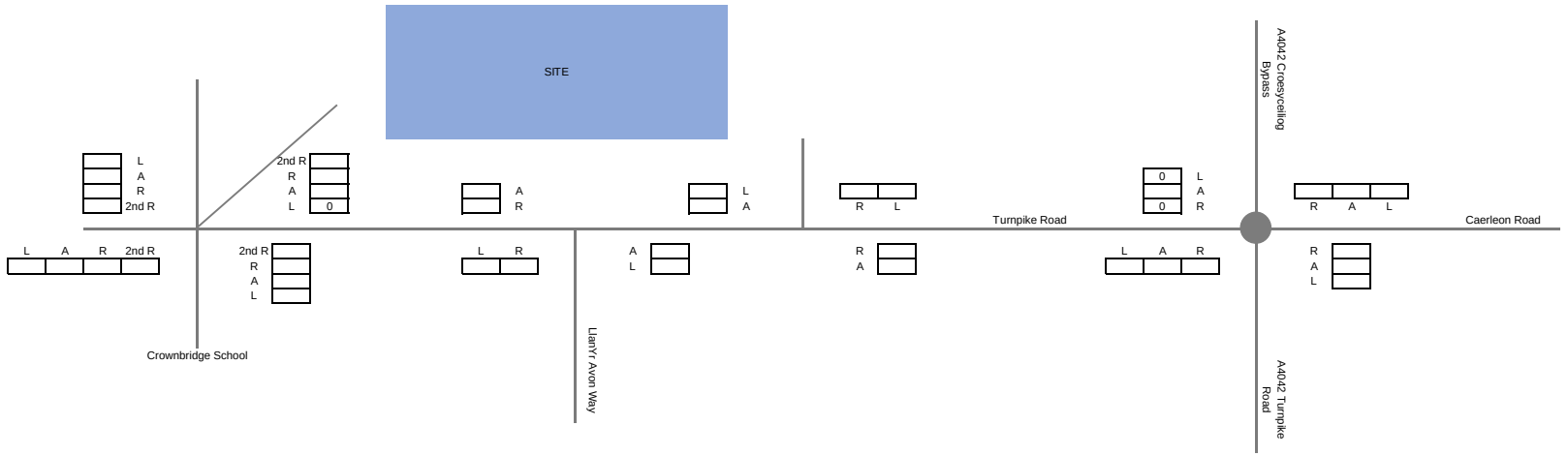
AECOM	Project	Gwent Police Operational Facility	Prepared	LvH
	Title	Traffic Flows - Proposed Permanent Staff (AM Peak Hour 08:00-09:00)	Checked	
AECOM 3rd Floor, Portwall Place Portwall Lane Bristol, BS1 6NA 0117 315 0700 www.aecom.com	Fig No.	-	Approved	
	Client	Gwent Police	Verified	
	Date	25/08/2023	Scale	NTS

Notes:



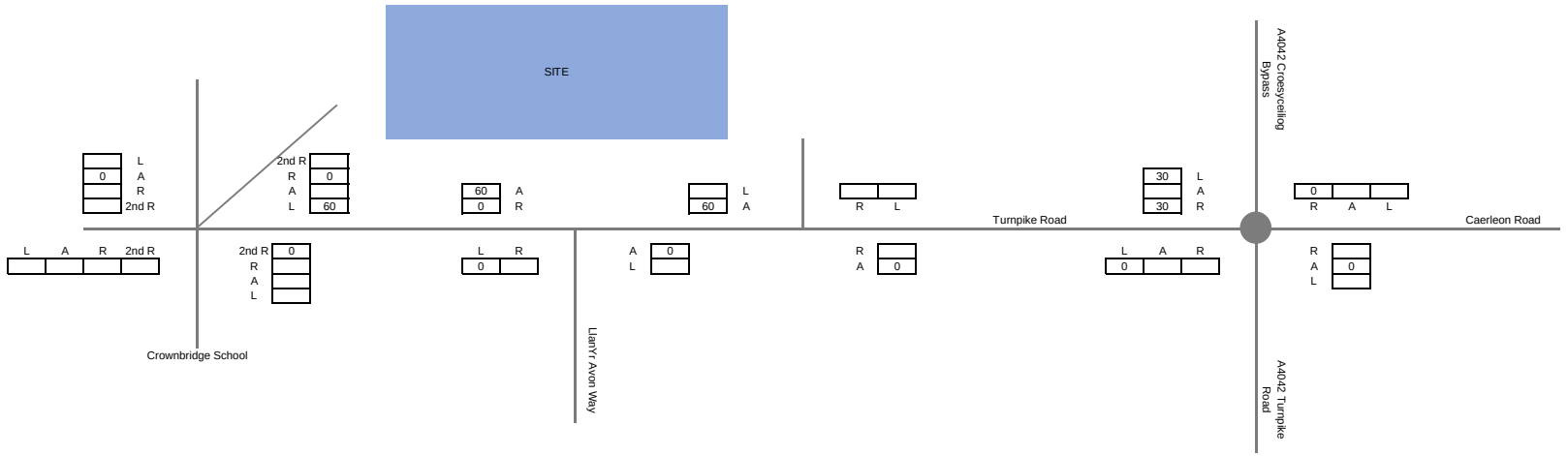
AECOM	Project	Gwent Police Operational Facility	Prepared	LvH
	Title	Traffic Flows - Proposed Permanent Staff (PM Peak Hour 16:00-17:00)	Checked	
AECOM 3rd Floor, Portwall Place Portwall Lane Bristol, BS1 6NA 0117 315 0700 www.aecom.com	Fig No.	-	Approved	
	Client	Gwent Police	Verified	
	Date	25/08/2023	Scale	NTS

Notes:



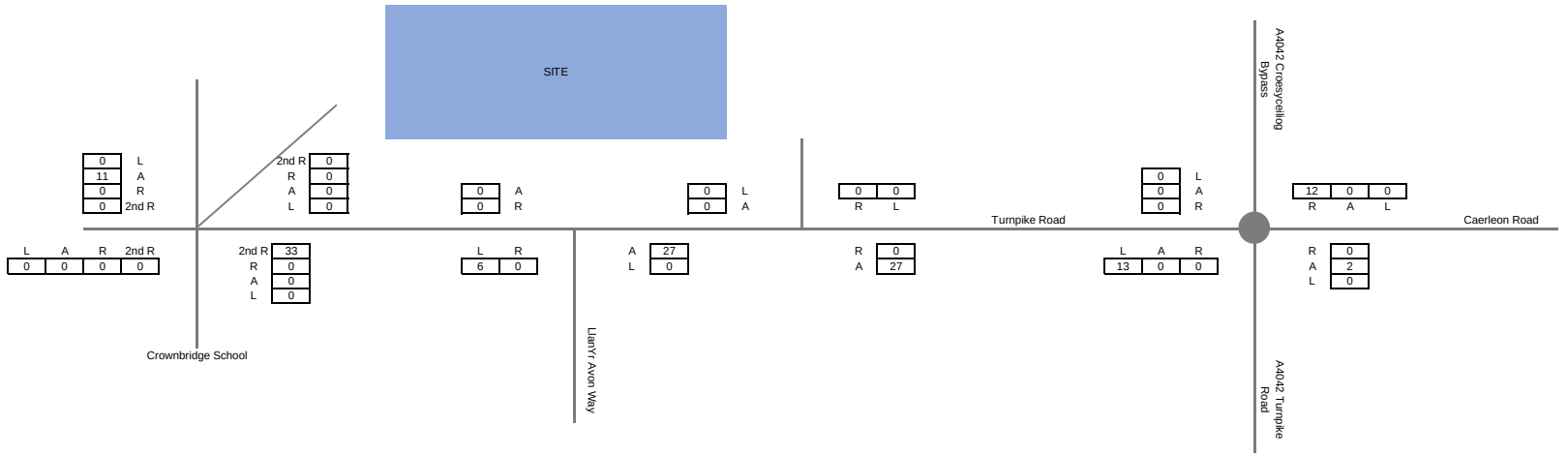
AECOM	Project	Gwent Police Operational Facility	Prepared	LvH
	Title	Traffic Flows - Proposed Staff visiting for Training (AM Peak Hour 08:00-09:00)	Checked	
AECOM 3rd Floor, Portwall Place Portwall Lane Bristol, BS1 6NA 0117 315 0700 www.aecom.com	Fig No.	-	Approved	
	Client	Gwent Police	Verified	
	Date	25/08/2023	Scale	NTS

Notes:



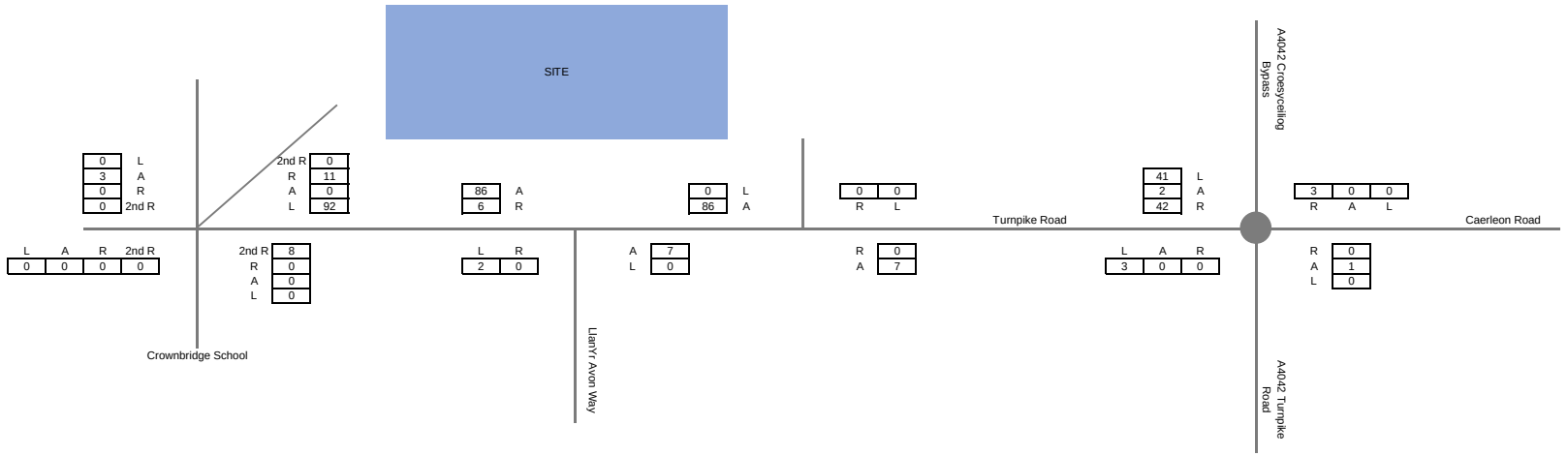
AECOM	Project	Gwent Police Operational Facility	Prepared	LvH
	Title	Traffic Flows - Proposed Staff visiting for Training (PM Peak Hour 16:00-17:00)	Checked	
AECOM 3rd Floor, Portwall Place Portwall Lane Bristol, BS1 6NA 0117 315 0700 www.aecom.com	Fig No.	-	Approved	
	Client	Gwent Police	Verified	
	Date	25/08/2023	Scale	NTS

Notes:



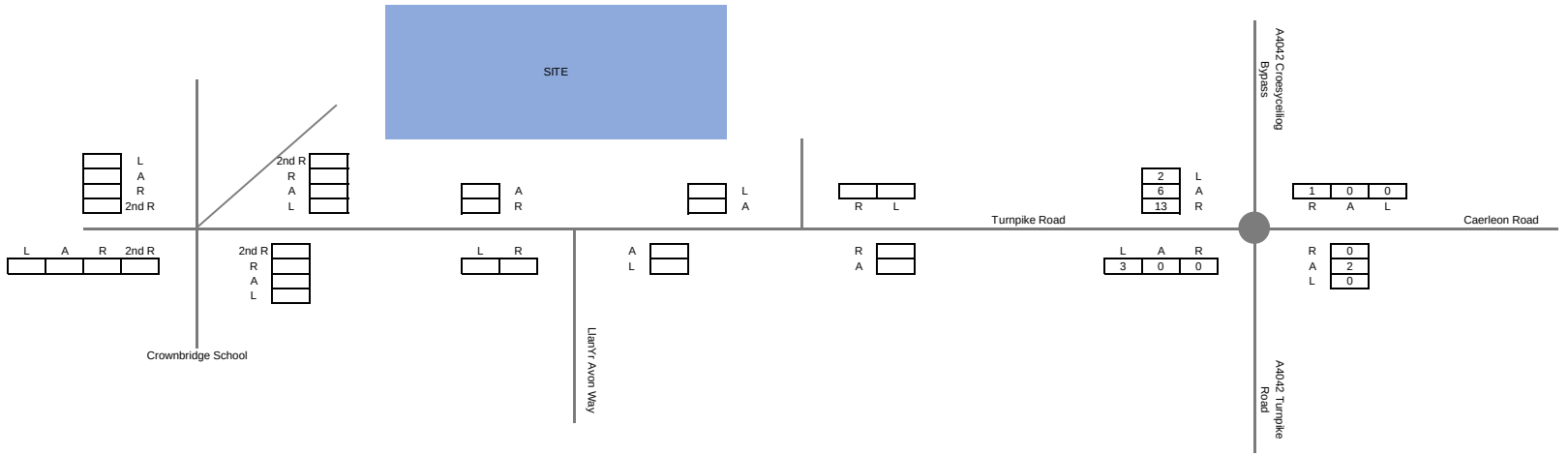
AECOM	Project	Gwent Police Operational Facility	Prepared	LvH
	Title	Traffic Flows - Total Proposed Staff (AM Peak Hour 08:00-09:00)	Checked	
AECOM 3rd Floor, Portwall Place Portwall Lane Bristol, BS1 6NA 0117 315 0700 www.aecom.com	Fig No.	-	Approved	
	Client	Gwent Police	Verified	
	Date	25/08/2023	Scale	NTS

Notes:



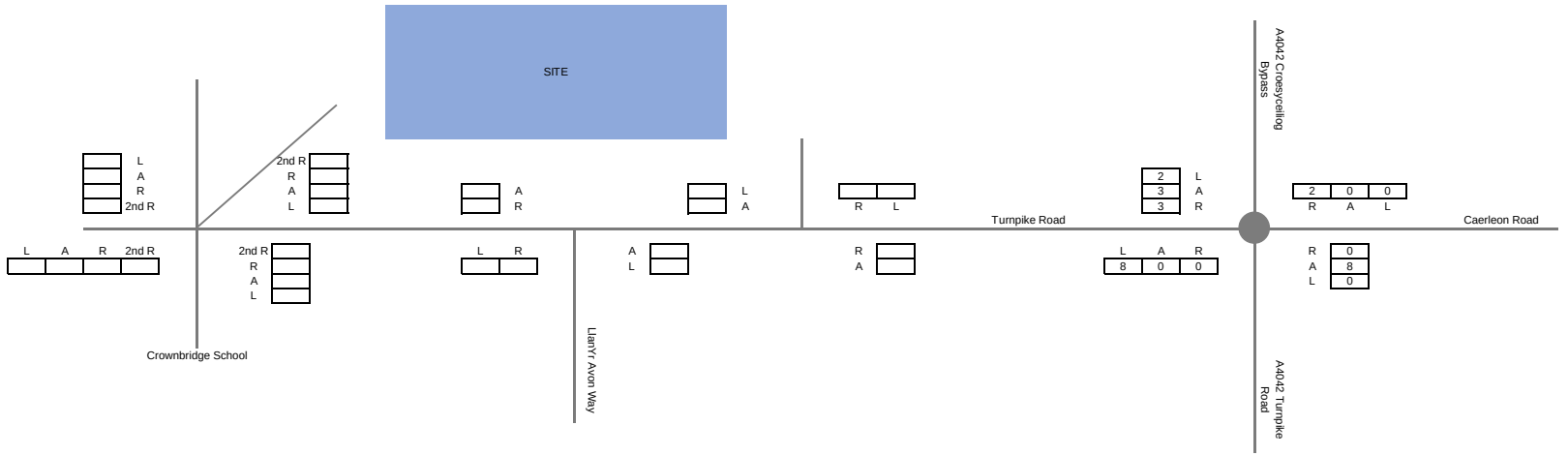
AECOM	Project	Gwent Police Operational Facility	Prepared	LvH
	Title	Traffic Flows - Total Proposed Staff (PM Peak Hour 17:00-18:00)	Checked	
AECOM 3rd Floor, Portwall Place Portwall Lane Bristol, BS1 6NA 0117 315 0700 www.aecom.com	Fig No.	-	Approved	
	Client	Gwent Police	Verified	
	Date	25/08/2023	Scale	NTS

Notes:



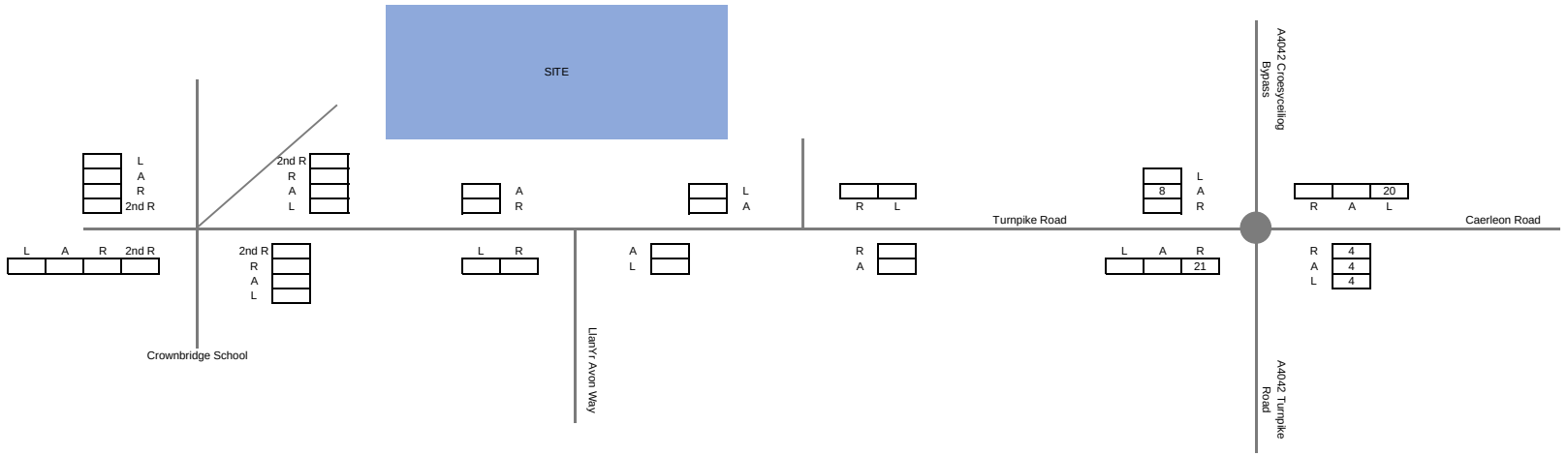
AECOM	Project	Gwent Police Operational Facility	Prepared	LvH
	Title	Traffic Flows - 146 Dwellings (AM Peak Hour 07:45-08:45)	Checked	
AECOM 3rd Floor, Portwall Place Portwall Lane Bristol, BS1 6NA 0117 315 0700 www.aecom.com	Fig No.	-	Approved	
	Client	Gwent Police	Verified	
	Date	25/08/2023	Scale	NTS

Notes:



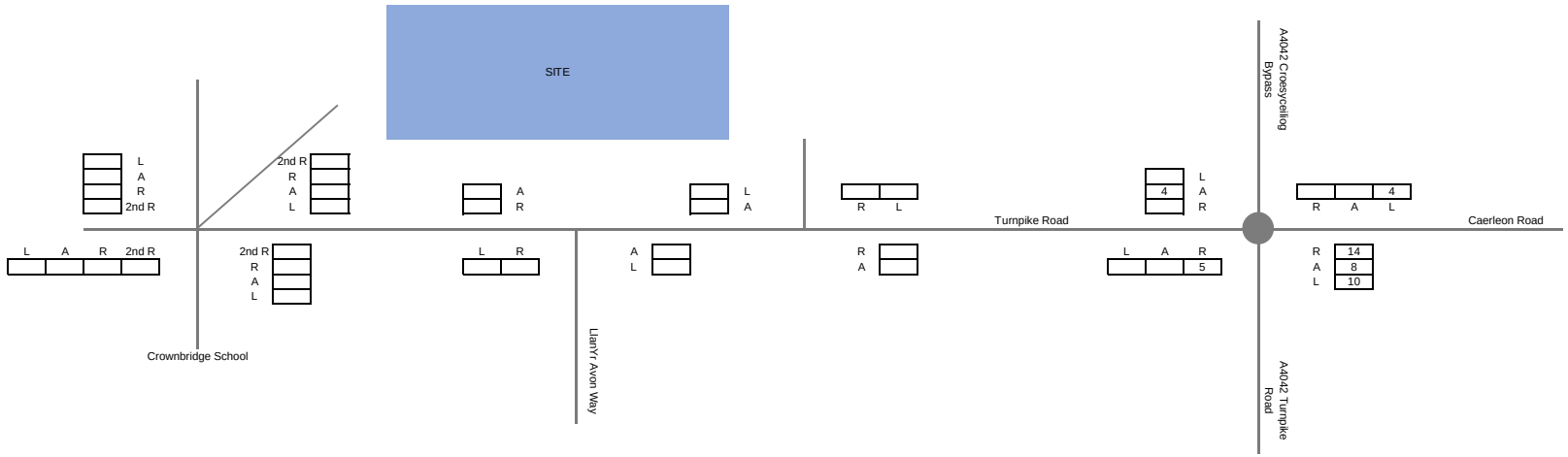
AECOM	Project	Gwent Police Operational Facility	Prepared	LvH
	Title	Traffic Flows - 146 Dwellings (PM Peak Hour 15:30-16:30)	Checked	
AECOM 3rd Floor, Portwall Place Portwall Lane Bristol, BS1 6NA 0117 315 0700 www.aecom.com	Fig No.	-	Approved	
	Client	Gwent Police	Verified	
	Date	25/08/2023	Scale	NTS

Notes:



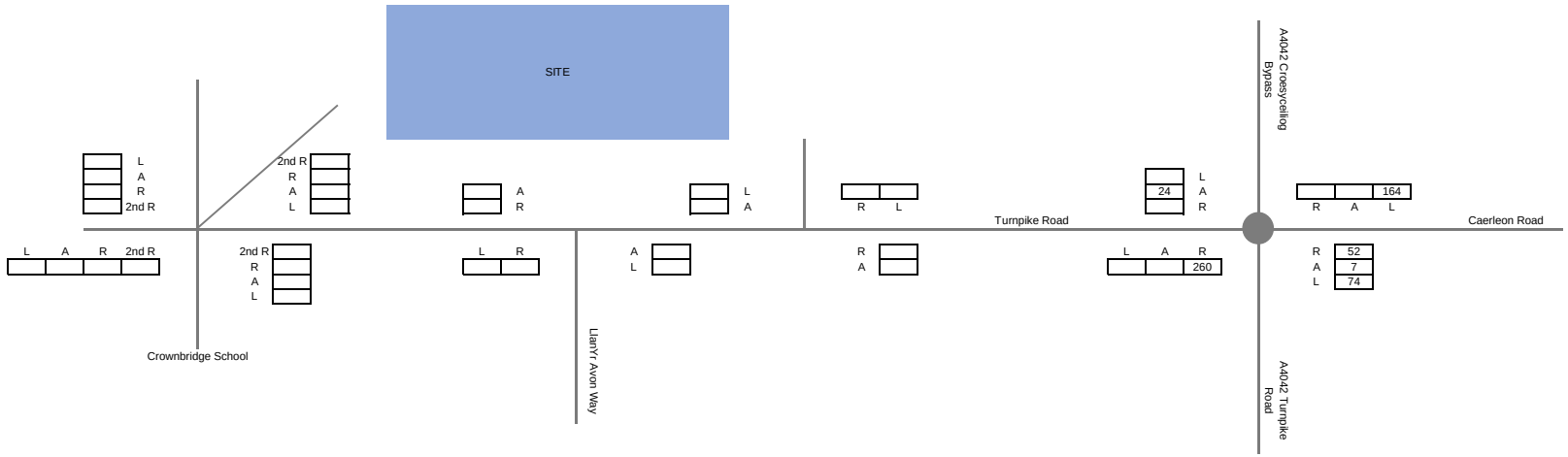
AECOM	Project	Gwent Police Operational Facility	Prepared	LvH
	Title	Traffic Flows - Mental Health Unit (AM Peak Hour)	Checked	
AECOM 3rd Floor, Portwall Place Portwall Lane Bristol, BS1 6NA 0117 315 0700 www.aecom.com	Fig No.	-	Approved	
	Client	Gwent Police	Verified	
	Date	25/08/2023	Scale	NTS

Notes:



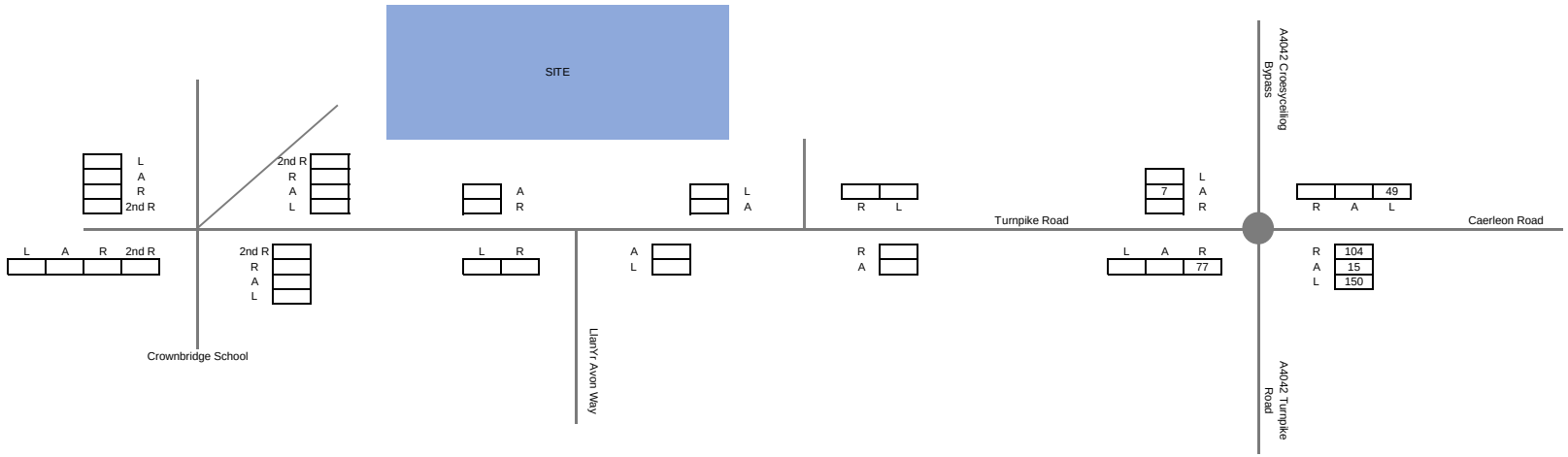
AECOM	Project	Gwent Police Operational Facility	Prepared	LvH
	Title	Traffic Flows - Mental Health Unit (PM Peak Hour)	Checked	
AECOM 3rd Floor, Portwall Place Portwall Lane Bristol, BS1 6NA 0117 315 0700 www.aecom.com	Fig No.	-	Approved	
	Client	Gwent Police	Verified	
	Date	25/08/2023	Scale	NTS

Notes:



AECOM	Project	Gwent Police Operational Facility	Prepared	LvH
	Title	Traffic Flows - Critical Care Unit (AM Peak Hour 08:00-09:00)	Checked	
AECOM 3rd Floor, Portwall Place Portwall Lane Bristol, BS1 6NA 0117 315 0700 www.aecom.com	Fig No.	-	Approved	
	Client	Gwent Police	Verified	
	Date	25/08/2023	Scale	NTS

Notes:



AECOM	Project	Gwent Police Operational Facility	Prepared	LvH
	Title	Traffic Flows - Critical Care Unit (PM Peak Hour 17:00-18:00)	Checked	
AECOM 3rd Floor, Portwall Place Portwall Lane Bristol, BS1 6NA 0117 315 0700 www.aecom.com	Fig No.	-	Approved	
	Client	Gwent Police	Verified	
	Date	25/08/2023	Scale	NTS

Notes:

Appendix H Junction Capacity Modelling Outputs

Junctions 9

ARCADY 9 - Roundabout Module

Filename: Turnpike Roundabout v0.2.j9
Path: L:\Legacy\UKBRI2FP001\VOL1TP\projects\Development Planning\Cardiff Office Work\Gwent Police Operational Facility, Cwmbran\Junction Modelling
Report generation date: 29/08/2023 13:33:40

Summary of junction performance

	AM				PM			
	Set ID	Queue (PCU)	Delay (s)	RFC	Set ID	Queue (PCU)	Delay (s)	RFC
	2023 Base							
Arm A	D1	4.2	7.71	0.80	D2	1.0	2.68	0.48
Arm B		0.6	4.39	0.35		0.8	3.86	0.45
Arm C		1.3	2.91	0.55		1.6	3.46	0.62
Arm D		0.5	4.00	0.33		0.5	4.41	0.32
	2026 Base							
Arm A	D3	4.8	8.65	0.82	D4	1.0	2.75	0.49
Arm B		0.6	4.58	0.36		0.9	4.01	0.47
Arm C		1.3	3.00	0.56		1.7	3.62	0.63
Arm D		0.5	4.14	0.34		0.5	4.59	0.34
	2026 Base + Committed							
Arm A	D5	44.4	67.80	1.02	D6	1.2	3.08	0.53
Arm B		1.0	5.44	0.48		2.0	6.34	0.67
Arm C		2.2	4.21	0.68		2.4	4.64	0.70
Arm D		0.9	6.00	0.46		0.7	5.67	0.40
	2026 Base + Committed + Proposed Development							
Arm A	D7	48.6	72.79	1.02	D8	1.2	3.18	0.54
Arm B		1.0	5.48	0.48		2.1	6.71	0.68
Arm C		2.3	4.33	0.69		2.4	4.68	0.70
Arm D		0.9	6.00	0.46		0.9	6.64	0.49

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

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

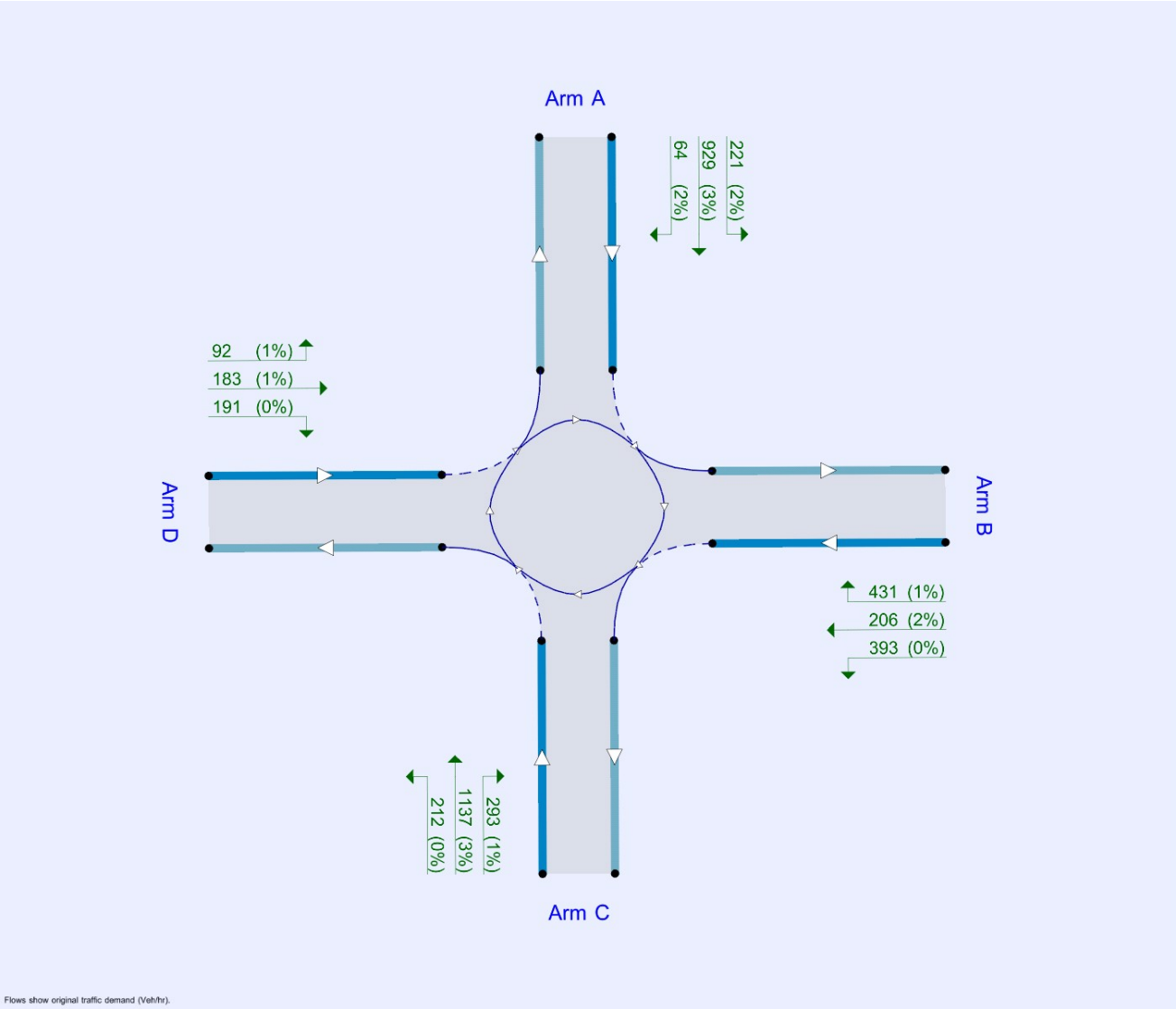
File summary

File Description

Title	
Location	
Site number	
Date	16/08/2023
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	EU\Benjamin.Burton1
Description	

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	PCU	perHour	s	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2023 Base	AM	ONE HOUR	07:45	09:15	15
D2	2023 Base	PM	ONE HOUR	15:45	17:15	15
D3	2026 Base	AM	ONE HOUR	07:45	09:15	15
D4	2026 Base	PM	ONE HOUR	15:45	17:15	15
D5	2026 Base + Committed	AM	ONE HOUR	07:45	09:15	15
D6	2026 Base + Committed	PM	ONE HOUR	15:45	17:15	15
D7	2026 Base + Committed + Proposed Development	AM	ONE HOUR	07:45	09:15	15
D8	2026 Base + Committed + Proposed Development	PM	ONE HOUR	15:45	17:15	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2023 Base, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm B - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		A, B, C, D	5.30	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
A	A4042 N	
B	Caerleon Rd	
C	A4042 S	
D	Turnpike Rd	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
A	8.00	10.00	17.1	67.0	71.0	18.0	
B	3.80	10.50	40.9	36.0	71.0	30.0	
C	9.50	10.20	1.2	64.0	71.0	12.0	
D	7.10	9.80	2.7	19.0	71.0	35.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
A	0.735	3083
B	0.637	2537
C	0.764	3236
D	0.590	2299

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

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2023 Base	AM	ONE HOUR	07:45	09:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		✓	1719	100.000
B		✓	399	100.000
C		✓	1365	100.000
D		✓	406	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	4	337	1276	102
	B	166	0	123	110
	C	783	368	5	209
	D	60	115	231	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	3	6	5
	B	8	0	7	4
	C	8	3	0	2
	D	2	4	2	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
A	0.80	7.71	4.2	A
B	0.35	4.39	0.6	A
C	0.55	2.91	1.3	A
D	0.33	4.00	0.5	A

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	1363	555	2675	0.510	1359	1.1	2.873	A
B	320	1279	1723	0.186	319	0.2	2.733	A
C	1086	304	3004	0.362	1084	0.6	1.979	A
D	314	1061	1673	0.187	313	0.2	2.713	A

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	1628	664	2595	0.627	1625	1.8	3.900	A
B	382	1530	1563	0.245	382	0.3	3.249	A
C	1297	363	2959	0.438	1296	0.8	2.288	A
D	374	1269	1550	0.241	374	0.3	3.138	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	1994	813	2485	0.802	1984	4.1	7.434	A
B	468	1868	1347	0.348	467	0.6	4.357	A
C	1589	444	2897	0.548	1587	1.3	2.901	A
D	458	1554	1383	0.332	458	0.5	3.986	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	1994	814	2484	0.802	1993	4.2	7.707	A
B	468	1876	1342	0.349	468	0.6	4.390	A
C	1589	446	2896	0.549	1589	1.3	2.910	A
D	458	1556	1381	0.332	458	0.5	4.000	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	1628	666	2593	0.628	1637	1.8	4.006	A
B	382	1540	1556	0.246	383	0.3	3.275	A
C	1297	365	2957	0.439	1299	0.8	2.296	A
D	374	1272	1549	0.242	375	0.3	3.147	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	1363	557	2673	0.510	1366	1.1	2.908	A
B	320	1286	1718	0.186	321	0.2	2.745	A
C	1086	305	3003	0.362	1087	0.6	1.988	A
D	314	1065	1671	0.188	314	0.2	2.722	A

2023 Base, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm B - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		A, B, C, D	3.38	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2023 Base	PM	ONE HOUR	15:45	17:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		✓	1133	100.000
B		✓	705	100.000
C		✓	1518	100.000
D		✓	353	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	2	164	910	57
	B	306	0	228	171
	C	1113	207	2	196
	D	47	163	143	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	2	3	2
	B	2	0	0	3
	C	3	1	0	0
	D	2	1	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
A	0.48	2.68	1.0	A
B	0.45	3.86	0.8	A
C	0.62	3.46	1.6	A
D	0.32	4.41	0.5	A

Main Results for each time segment

15:45 - 16:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	877	389	2796	0.314	875	0.5	1.924	A
B	539	858	1991	0.271	538	0.4	2.515	A
C	1170	412	2922	0.400	1167	0.7	2.097	A
D	268	1255	1559	0.172	267	0.2	2.806	A

16:00 - 16:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	1047	466	2740	0.382	1046	0.6	2.183	A
B	644	1026	1884	0.342	643	0.5	2.947	A
C	1397	493	2860	0.488	1395	1.0	2.512	A
D	320	1501	1413	0.226	319	0.3	3.314	A

16:15 - 16:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	1282	570	2664	0.481	1281	0.9	2.674	A
B	789	1256	1737	0.454	787	0.8	3.847	A
C	1710	603	2776	0.616	1708	1.6	3.440	A
D	391	1838	1215	0.322	391	0.5	4.395	A

16:30 - 16:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	1282	571	2663	0.482	1282	1.0	2.680	A
B	789	1258	1736	0.454	789	0.8	3.860	A
C	1710	604	2775	0.616	1710	1.6	3.459	A
D	391	1840	1213	0.323	391	0.5	4.411	A

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	1047	467	2739	0.382	1048	0.6	2.191	A
B	644	1028	1882	0.342	645	0.5	2.958	A
C	1397	494	2859	0.488	1399	1.0	2.529	A
D	320	1506	1411	0.227	320	0.3	3.326	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	877	391	2795	0.314	878	0.5	1.931	A
B	539	861	1989	0.271	540	0.4	2.526	A
C	1170	413	2921	0.400	1171	0.7	2.108	A
D	268	1260	1556	0.172	268	0.2	2.817	A

2026 Base, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm B - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		A, B, C, D	5.78	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D3	2026 Base	AM	ONE HOUR	07:45	09:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		✓	1755	100.000
B		✓	408	100.000
C		✓	1394	100.000
D		✓	415	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	4	344	1303	104
	B	170	0	126	112
	C	800	376	5	213
	D	62	117	236	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	3	6	5
	B	8	0	7	4
	C	8	3	0	2
	D	2	4	2	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
A	0.82	8.65	4.8	A
B	0.36	4.58	0.6	A
C	0.56	3.00	1.3	A
D	0.34	4.14	0.5	A

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	1392	567	2666	0.522	1387	1.1	2.954	A
B	327	1306	1706	0.192	326	0.3	2.781	A
C	1109	310	2999	0.370	1107	0.6	2.008	A
D	320	1084	1659	0.193	319	0.2	2.754	A

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	1662	678	2584	0.643	1659	1.9	4.084	A
B	391	1562	1542	0.253	391	0.4	3.331	A
C	1325	371	2953	0.449	1324	0.9	2.334	A
D	383	1297	1534	0.249	382	0.3	3.206	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	2035	830	2473	0.823	2024	4.7	8.256	A
B	479	1906	1323	0.362	478	0.6	4.536	A
C	1622	454	2890	0.561	1620	1.3	2.994	A
D	469	1588	1363	0.344	468	0.5	4.123	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	2035	831	2472	0.823	2035	4.8	8.651	A
B	479	1915	1317	0.364	479	0.6	4.577	A
C	1622	455	2889	0.562	1622	1.3	3.004	A
D	469	1590	1361	0.344	469	0.5	4.135	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	1662	680	2583	0.643	1673	1.9	4.220	A
B	391	1574	1535	0.255	392	0.4	3.362	A
C	1325	373	2951	0.449	1327	0.9	2.344	A
D	383	1300	1532	0.250	383	0.3	3.217	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	1392	569	2665	0.522	1395	1.2	2.995	A
B	327	1313	1701	0.192	328	0.3	2.796	A
C	1109	312	2998	0.370	1110	0.6	2.016	A
D	320	1088	1657	0.193	321	0.2	2.762	A

2026 Base, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm B - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		A, B, C, D	3.52	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D4	2026 Base	PM	ONE HOUR	15:45	17:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		✓	1158	100.000
B		✓	721	100.000
C		✓	1551	100.000
D		✓	361	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	2	168	929	59
	B	313	0	233	175
	C	1137	211	2	201
	D	48	167	146	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	2	3	2
	B	2	0	0	3
	C	3	1	0	0
	D	2	1	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
A	0.49	2.75	1.0	A
B	0.47	4.01	0.9	A
C	0.63	3.62	1.7	A
D	0.34	4.59	0.5	A

Main Results for each time segment

15:45 - 16:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	896	398	2790	0.321	894	0.5	1.950	A
B	551	877	1979	0.279	550	0.4	2.557	A
C	1195	422	2914	0.410	1192	0.7	2.135	A
D	274	1282	1543	0.177	273	0.2	2.854	A

16:00 - 16:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	1070	476	2733	0.392	1069	0.7	2.223	A
B	659	1048	1869	0.352	658	0.5	3.017	A
C	1427	504	2851	0.500	1426	1.0	2.582	A
D	327	1534	1394	0.234	327	0.3	3.395	A

16:15 - 16:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	1311	582	2655	0.494	1309	1.0	2.748	A
B	807	1283	1720	0.469	805	0.9	3.993	A
C	1748	617	2765	0.632	1745	1.7	3.601	A
D	400	1877	1192	0.336	400	0.5	4.571	A

16:30 - 16:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	1311	583	2654	0.494	1311	1.0	2.754	A
B	807	1285	1719	0.469	806	0.9	4.008	A
C	1748	618	2764	0.632	1748	1.7	3.623	A
D	400	1880	1190	0.336	400	0.5	4.591	A

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	1070	477	2732	0.392	1071	0.7	2.232	A
B	659	1051	1868	0.353	660	0.6	3.032	A
C	1427	506	2850	0.501	1430	1.0	2.600	A
D	327	1538	1392	0.235	328	0.3	3.409	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	896	399	2789	0.321	897	0.5	1.956	A
B	551	879	1977	0.279	552	0.4	2.569	A
C	1195	423	2913	0.410	1196	0.7	2.148	A
D	274	1287	1540	0.178	274	0.2	2.866	A

2026 Base + Committed, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm B - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		A, B, C, D	31.18	D

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D5	2026 Base + Committed	AM	ONE HOUR	07:45	09:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		✓	1940	100.000
B		✓	555	100.000
C		✓	1678	100.000
D		✓	468	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	4	528	1303	105
	B	226	0	204	125
	C	800	657	5	216
	D	64	155	249	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	2	6	5
	B	6	0	5	3
	C	8	2	0	2
	D	2	3	2	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
A	1.02	67.80	44.4	F
B	0.48	5.44	1.0	A
C	0.68	4.21	2.2	A
D	0.46	6.00	0.9	A

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	1531	817	2482	0.617	1525	1.7	3.915	A
B	439	1315	1700	0.258	437	0.4	2.991	A
C	1325	362	2960	0.448	1321	0.8	2.299	A
D	361	1339	1510	0.239	359	0.3	3.200	A

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	1829	978	2364	0.773	1821	3.5	6.863	A
B	524	1572	1536	0.341	523	0.5	3.727	A
C	1582	433	2906	0.544	1580	1.2	2.844	A
D	431	1601	1355	0.318	430	0.5	3.981	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	2239	1196	2204	1.016	2138	28.9	36.041	E
B	641	1856	1355	0.473	640	0.9	5.270	A
C	1937	525	2836	0.683	1933	2.2	4.165	A
D	527	1958	1144	0.461	526	0.9	5.947	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	2239	1199	2202	1.017	2177	44.4	67.803	F
B	641	1886	1336	0.480	641	1.0	5.437	A
C	1937	528	2833	0.684	1937	2.2	4.212	A
D	527	1963	1141	0.462	527	0.9	5.998	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	1829	982	2361	0.774	1991	3.8	15.179	C
B	524	1698	1456	0.360	525	0.6	4.066	A
C	1582	444	2897	0.546	1586	1.3	2.888	A
D	431	1607	1351	0.319	432	0.5	4.014	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	1531	821	2479	0.618	1540	1.7	4.051	A
B	439	1327	1692	0.259	439	0.4	3.020	A
C	1325	364	2958	0.448	1326	0.9	2.315	A
D	361	1344	1506	0.239	361	0.3	3.217	A

2026 Base + Committed, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm B - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		A, B, C, D	4.69	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D6	2026 Base + Committed	PM	ONE HOUR	15:45	17:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		✓	1213	100.000
B		✓	1030	100.000
C		✓	1641	100.000
D		✓	380	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	2	221	929	61
	B	431	0	393	206
	C	1137	293	2	209
	D	50	181	149	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	2	3	2
	B	1	0	0	2
	C	3	1	0	0
	D	2	1	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
A	0.53	3.08	1.2	A
B	0.67	6.34	2.0	A
C	0.70	4.64	2.4	A
D	0.40	5.67	0.7	A

Main Results for each time segment

15:45 - 16:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	938	473	2735	0.343	936	0.5	2.053	A
B	782	880	1977	0.396	779	0.7	3.025	A
C	1263	533	2830	0.446	1260	0.8	2.340	A
D	288	1431	1455	0.198	287	0.2	3.102	A

16:00 - 16:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	1121	565	2667	0.420	1120	0.7	2.389	A
B	934	1053	1867	0.500	932	1.0	3.878	A
C	1509	637	2750	0.549	1507	1.2	2.958	A
D	344	1712	1289	0.267	344	0.4	3.832	A

16:15 - 16:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	1372	692	2574	0.533	1371	1.2	3.069	A
B	1143	1289	1716	0.666	1139	2.0	6.248	A
C	1848	779	2642	0.699	1843	2.3	4.585	A
D	421	2093	1064	0.396	420	0.7	5.622	A

16:30 - 16:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	1372	693	2573	0.533	1372	1.2	3.080	A
B	1143	1290	1715	0.667	1143	2.0	6.342	A
C	1848	781	2640	0.700	1847	2.4	4.645	A
D	421	2099	1061	0.397	421	0.7	5.670	A

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	1121	568	2665	0.420	1122	0.7	2.399	A
B	934	1056	1865	0.501	937	1.0	3.929	A
C	1509	640	2747	0.549	1513	1.3	2.995	A
D	344	1719	1285	0.268	345	0.4	3.864	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	938	475	2734	0.343	939	0.5	2.062	A
B	782	883	1975	0.396	783	0.7	3.049	A
C	1263	535	2828	0.447	1265	0.8	2.358	A
D	288	1437	1451	0.199	289	0.3	3.122	A

2026 Base + Committed + Proposed Development, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm B - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		A, B, C, D	33.32	D

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D7	2026 Base + Committed + Proposed Development	AM	ONE HOUR	07:45	09:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		✓	1952	100.000
B		✓	557	100.000
C		✓	1691	100.000
D		✓	468	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	4	528	1303	117
	B	226	0	204	127
	C	800	657	5	229
	D	64	155	249	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	2	6	4
	B	6	0	5	3
	C	8	2	0	2
	D	2	3	2	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
A	1.02	72.79	48.6	F
B	0.48	5.48	1.0	A
C	0.69	4.33	2.3	A
D	0.46	6.00	0.9	A

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	1540	817	2482	0.620	1533	1.7	3.949	A
B	440	1324	1694	0.260	439	0.4	3.007	A
C	1335	372	2952	0.452	1331	0.9	2.323	A
D	361	1339	1510	0.239	359	0.3	3.200	A

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	1839	978	2364	0.778	1831	3.5	6.985	A
B	526	1582	1530	0.344	525	0.5	3.758	A
C	1594	445	2896	0.550	1592	1.3	2.889	A
D	431	1601	1355	0.318	430	0.5	3.980	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	2252	1196	2204	1.022	2143	30.9	37.752	E
B	644	1863	1351	0.477	642	0.9	5.319	A
C	1952	538	2825	0.691	1948	2.3	4.280	A
D	527	1958	1144	0.461	526	0.9	5.946	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	2252	1199	2202	1.023	2181	48.6	72.794	F
B	644	1892	1332	0.483	644	1.0	5.485	A
C	1952	542	2823	0.692	1952	2.3	4.333	A
D	527	1963	1141	0.462	527	0.9	5.998	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	1839	982	2361	0.779	2018	3.9	17.417	C
B	526	1720	1442	0.365	527	0.6	4.138	A
C	1594	458	2887	0.552	1598	1.3	2.939	A
D	431	1607	1351	0.319	432	0.5	4.016	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	1540	821	2479	0.621	1548	1.7	4.088	A
B	440	1336	1686	0.261	441	0.4	3.038	A
C	1335	375	2950	0.452	1336	0.9	2.342	A
D	361	1344	1506	0.239	361	0.3	3.220	A

2026 Base + Committed + Proposed Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm B - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		A, B, C, D	4.94	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D8	2026 Base + Committed + Proposed Development	PM	ONE HOUR	15:45	17:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		✓	1216	100.000
B		✓	1030	100.000
C		✓	1644	100.000
D		✓	466	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	2	221	929	64
	B	431	0	393	206
	C	1137	293	2	212
	D	92	183	191	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	2	3	2
	B	1	0	0	2
	C	3	1	0	0
	D	1	1	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
A	0.54	3.18	1.2	A
B	0.68	6.71	2.1	A
C	0.70	4.68	2.4	A
D	0.49	6.64	0.9	A

Main Results for each time segment

15:45 - 16:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	941	506	2711	0.347	939	0.5	2.084	A
B	782	914	1955	0.400	779	0.7	3.080	A
C	1266	535	2828	0.448	1262	0.8	2.346	A
D	353	1431	1455	0.243	352	0.3	3.280	A

16:00 - 16:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	1123	605	2638	0.426	1122	0.8	2.439	A
B	934	1093	1841	0.507	932	1.0	3.987	A
C	1511	640	2748	0.550	1510	1.2	2.969	A
D	421	1712	1289	0.327	421	0.5	4.166	A

16:15 - 16:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	1376	740	2539	0.542	1374	1.2	3.171	A
B	1143	1338	1685	0.679	1139	2.1	6.596	A
C	1851	782	2639	0.701	1846	2.4	4.618	A
D	516	2093	1064	0.485	514	0.9	6.564	A

16:30 - 16:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	1376	742	2537	0.542	1376	1.2	3.183	A
B	1143	1340	1684	0.679	1143	2.1	6.713	A
C	1851	785	2637	0.702	1851	2.4	4.679	A
D	516	2099	1061	0.486	516	0.9	6.645	A

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	1123	608	2636	0.426	1125	0.8	2.453	A
B	934	1096	1839	0.508	938	1.0	4.046	A
C	1511	643	2745	0.551	1516	1.3	3.007	A
D	421	1719	1285	0.328	423	0.5	4.211	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	941	508	2709	0.347	942	0.5	2.093	A
B	782	917	1953	0.400	783	0.7	3.108	A
C	1266	538	2826	0.448	1267	0.8	2.366	A
D	353	1437	1451	0.243	354	0.3	3.302	A

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