Bridgend College

PENCOED CAMPUS RESIDENTIAL DEVELOPMENT

Transport Assessment

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TYPE OF DOCUMENT (VERSION) CONFIDENTIAL

PROJECT NO. 70072336

OUR REF. NO. BRIDGEND COLLEGE TRANSPORT ASSESSMENT

DATE: MAY 2021

Bridgend College

PENCOED CAMPUS RESIDENTIAL DEVELOPMENT

Transport Assessment

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QUALITY CONTROL

Issue / Revision	First issue	Revision 1	Revision 2	Revision 3	Revision 4
Remarks	Final Draft	Final	Final	Additional Scope	Additional Scope
Date	May 2020	October 2020	December 2020	February 2021	May 2021
Prepared by	Rhys Richards	Rhys Richards	Rhys Richards	Abby Harris	Abby Harris
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Signature					
Project number	70072336	70072336	70072336	70072336	70072336
Report number	1	2	3	4	5
File reference	\\uk.wspgroup.com\central data\Projects\700723xx\70072336 - Bridgend College - Transport Assessment\03 WIP\TP Transport Planning\05 Reports				

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1 INTRODUCTION

1.1 BACKGROUND

WSP has been appointed by Bridgend College to produce a Transport Assessment (TA) in support of submission of the ongoing promotion of Bridgend College's surplus land at the Pencoed Campus through the Replacement Local Development Plan (LDP). The proposed site is being put forward for up to 770 dwellings and a 1 form of entry primary school situated off the A473 in Bridgend.

The development site is located on land adjacent to Bridgend College's Pencoed Campus and is being promoted as a proposed site allocation through the LDP. This Transport Assessment is being prepared in support of Stage 2 of the Candidate Site Assessment.

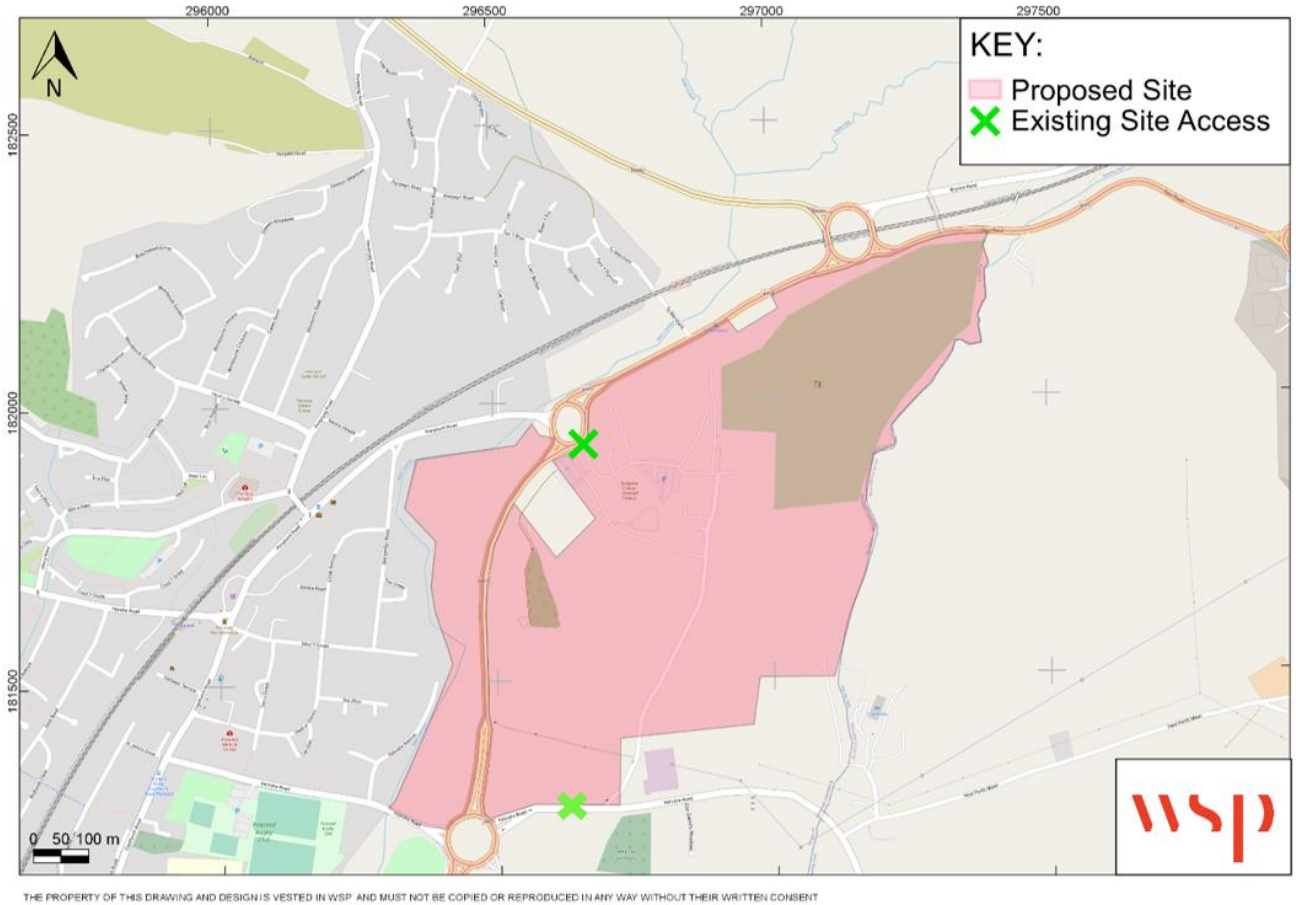
1.2 EXISTING SITE OVERVIEW

The application site can be found north-east of Pencoed town centre and is bounded by the A473 to the north and west, Felindre Road to the south and agricultural land to the east.

The site is currently accessed via the A473/Penybont Road roundabout on the western extents of the site. The access currently serves the existing College Campus.

The proposed site and its surroundings are demonstrated in Figure 1-1.

Figure 1-1 - Indicative Site Boundary



1.3 SCOPING

WSP has reviewed the Local Highway Authority's proforma (Bridgend County Borough Council – Transport Assessment Checklist) for recommended content to determine the scope for the TA which will complete the following assessments:

Existing Conditions

- Undertake a detailed site visit to review the local area and appraise the sustainable travel options that are currently available;
- Review the existing conditions including the site scale, surroundings, local highway network, existing accesses and potential restrictions;
- Provide an amended summary of the accessibility of the site. Existing cycle and pedestrian links will be assessed, along with the locations of bus stops and associated bus services to encourage sustainable travel; and,
- Obtain and review collision data for the most recent five-year period to ensure that the development will not exacerbate any highway safety issues.

Planning Policy and Context

- Review the site planning history; and,
- Review and amend the planning policy context with any updates to planning policy.

Development Proposals

- Provide a description of the development proposals including site composition and scale;
- Detail and provide justification, as appropriate, for the level of car and cycle parking;
- Detail and provide justification, as appropriate, for the proposed access arrangements; and,
- Detail the servicing arrangements.

Trip Generation and Distribution

- Summarise the existing and proposed multimodal trip generation; and,
- Highlight the net person impact the proposed development is likely to create on the local highway network.

Impacts on the Highway Network

- Provide a commentary on the impacts of the development on the local highway network and on sustainable modes of travel; and,
- Amend the junction modelling to include the new proposed site access arrangements and amended traffic surveys.

Due to stay at home and social distancing orders as a consequence of COVID-19, WSP are conscious that traffic surveys cannot be taken and that the Council will accept modelling at a later date. WSP will liaise with the Council to agree scope of the modelling.

1.4 REPORT STRUCTURE

The remainder of this report is structured as follows:

- **Chapter 2: Policy Review** - A review of the relevant National, Regional and Local planning policies and objectives.

- **Chapter 3**: **Baseline Conditions**– A review of the existing highway conditions and a review of the existing sustainable transport infrastructure.
- **Chapter 4**: **Development Proposals** – An overview of the development proposals for the site.
- **Chapter 5**: **Multi-Modal Trip Generation** – A summary of the multi-modal trip generation profile of the proposed development.
- **Chapter 6: Traffic Assessment** - A review of the impact of the proposed development on the traffic network.
- **Chapter 7: Sustainable Transport Impact** – A review of the impact of the proposed development on the sustainable transport network.
- **Chapter 8: Outline Travel Plan** – Details of the proposed Travel Plan for this development.
- **Chapter 9: Summary and Conclusions** – Provides a summary and conclusion.

2 POLICY REVIEW

2.1 INTRODUCTION

This chapter of the TA details the relevant transport related policies at a national, regional and local level, including relevant car and cycle parking standards. An overview of the following documents has been provided:

- Wales National Transport Plan (March 2010);
- Planning Policy Wales (PPW) Edition 10;
- Technical Advice Note 18 (Transport);
- Wales Transport Strategy (2008);
- Active Travel (Wales) Act (2013);
- The Well-Being of Future Generations (Wales) Act (2015);
- South East Wales Transport Alliance Regional Transport Plan (2010);
- Bridgend County Borough Council Local Transport Plan 2015-2030 (2015); and
- Bridgend County Borough Council Design Guides and Supplementary Planning Guidance (SPG) – SPG Parking Standards Volume 1 (2017).

2.2 NATIONAL POLICY

WALES NATIONAL TRANSPORT PLAN (MARCH 2010)

The National Transport Plan (NTP), adopted in March 2010, seeks to deliver the aims and objectives of the Wales Transport Strategy (2008). It focuses on the need for integrated transport as a way of enabling people to travel more efficiently and sustainably. The NTP sets out a number of aims to maximise the benefits of reducing reliance on private car travel and encouraging sustainable travel choices, including to:

- continue establishing sustainable travel centres across Wales;
- improve planning development processes to seek stronger integration between transport and key facilities;
- make sustainable travel choices an easier option for people;
- improve the quality and integration of local bus services;
- provide better access to rail services including improvements for disabled and vulnerable users;
- enable sustainable access to key services, particularly where access is currently difficult;
- ensure trunk road networks operate to meet statutory obligations and strategic objectives;
- improve road safety with emphasis on reducing casualty rates of vulnerable users;
- support the modal shift of freight from road to rail; and
- reduce the environmental effects of construction and maintenance by promoting more sustainable methods.

In addition to the above, the NTP also includes two aims which are specifically related to the east-west corridor in South Wales (which is where The Site is located):

- to improve the reliability, quality and frequency of east-west rail services in South Wales; and
- to improve journey time reliability and safety along east-west road corridors in South Wales.

PLANNING POLICY WALES (PPW) EDITION 10 (DECEMBER 2018)

Planning Policy Wales (PPF), published December 2018, sets out Welsh Government's planning policies and provides guidance as to how these should be applied. PPW Edition 10 is the most recent publication and replaces the previous framework published in November 2016.

In light of the Well-being of Future Generations (Wales) Act 2015, the Planning Policy Wales (PPW) was revised in 2018. The revised PPW has been updated to deliver wider Welsh Government (WG) objectives. Four key themes to Placemaking have been introduced in the revised PPW including "Active and Social Places" which specifically provides a commitment towards the promotion of walking and cycling thorough the planning system; and "Productive and Enterprising Places" which highlights the importance of transport infrastructure considerations in improving accessibility.

Chapter 4 of the PPW sets out key Active and Social outcomes that the policy will aim to achieve through delivery of a more effective and efficient transport system that focuses of sustainable travel and better integration between transport measures and land-use planning. These include:

- accessibility by means of active travel and public transport;
- minimising the need to travel and reducing reliance on car travel;
- convenient access to goods and services;
- reduction of environmental risks;
- promotion of physical and mental health and well-being; and
- provision of community-based facilities and services.

Chapter 5 of the PPW sets out key Productive and Enterprising outcomes that the policy will aim to achieve, through the delivery of new / improved transportation infrastructure (especially in new developments) that create sustainable transport nodes and interchanges and promote active travel and travel by public transport, as per WG's wider Well-being objectives. Outcomes include:

- supporting transport improvements which increase the use of sustainable transport and reduced reliance on the private car for daily journeys;
- supporting necessary public transport infrastructure improvements which support new development and appropriate routes, measures and facilities (including provision of new stations, rail lines and park and ride schemes etc.); and
- designing new roads that take into account the transport hierarchy, whereby stainable transport is considered before private motor vehicles.

The above principles are further endorsed in Chapter 3 (Strategic and Spatial Choices) of the PPW which reiterates the need for new residential development to be located where it would be easily accessible by public transport, walking and cycling to promote heathier places which are in line with WG's Well-being objectives.

2.2.1 TECHNICAL ADVICE NOTE 18 (TRANSPORT)

Technical Advice Note 18 (TAN18) elaborates on the relationship between land-use planning and transport and outlines a range of key principles that should inform future patterns of development. TAN18 also promotes the overall integration of transport as summarised in paragraph 2.2.3 above.

The Advice Note states that residential development plans which prioritise the following elements are favoured:

- development that is located near to employment, retail and services with good access by modes other than the car;
- development that is located with good walking and cycling access to primary and secondary schools, and good public transport links to higher education and employment (or where such access is proposed to be provided in the Regional Travel Plan);
- schemes which include for ancillary land uses including local shops, services and employment;
- parking provision in line with policy standards and in relation to public transport accessibility and capacity;
- layouts which incorporate traffic management measures including home zones, traffic calming, 20mph speed limits and layouts which enable public transport to pass through easily; and
- layouts and densities which maximise walking and cycling opportunities to local facilities and public transport stops.

THE WALES TRANSPORT STRATEGY (2008)

The Wales Transport Strategy (WTS) identifies a range of long-term goals to improve connectivity and reliability, safeguard the environment and promote sustainable transport networks including reducing the need to travel and demand on the existing transport system. The following key principles have been identified in the WTS as being critical to the future transport agenda:

- a more effective and efficient transport system;
- greater use of the most sustainable and healthy forms of travel;
- reduced demands on the transport system; and
- a reduced impact of transport on greenhouse gas emissions.

2.2.2 ACTIVE TRAVEL (WALES) ACT (2013)

The Active Travel (Wales) Act (enshrined in legislation in 2013) requires WG and all local authorities to actively promote and provide for walking and cycling opportunities. By doing this, WG hopes that the benefits of using active travel modes will be realised by individuals and society across Wales.

To achieve the aims of the Act, local highways authorities have been given a duty to consider the needs of pedestrians and cyclists and make better provision for travel by these modes. This will be monitored by producing maps to show walking and cycling routes across all authorities in Wales, identifying existing routes which are safe and suitable routes, and routes which are aspirational. This will be met by a programme of funding from WG and the Local Transport Fund (LTF) to deliver Safe Routes in Communities (SRIC) programme and increase the Active Travel allocation.

THE WELL-BEING OF FUTURE GENERATIONS (WALES) ACT (2015)

The Well-Being Act (2013) is aimed at improving social, economic, environmental and cultural well-being into the long-term. It requires all public bodies to proactively work with communities to ensure good quality of life, for both current and future generations, placing importance on creating attractive, viable, safe and well-connected communities.

To accomplish this, the Act sets out seven Well-Being Goals. These are: "*a globally responsible Wales; a prosperous Wales; a resilient Wales; a healthier Wales; a more equal Wales; a Wales of cohesive communities; and a Wales of vibrant culture and thriving Welsh language".*

2.3 REGIONAL POLICY

2.3.1 SOUTH EAST WALES TRANSPORT ALLIANCE REGIONAL TRANSPORT PLAN (2010)

Bridgend is one of ten local authorities which sit within the South-East Wales region. The aim of the Regional Transport Plan (RTP) is to deliver social, economic and environmental initiatives central to the Wales Spatial Plan and Wales Transport Strategy.

To help the Wales Spatial Plan and Wales Transport Strategy achieve their aims, the RTP has established a vision to deliver:

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

To deliver this transport strategy, the RTP has packaged a set of objectives which aim to address the following:

- Safety and security;
- Connectivity and accessibility;
- Quality and efficiency;
- Environment; and
- Land use and regeneration.

2.4 LOCAL POLICY

BRIDGEND COUNTY BOROUGH COUNCIL LOCAL TRANSPORT PLAN 2015 – 2030 (2015)

Bridgend County Borough Council's Local Transport plan aims to have:

"An effective, accessible, integrated and sustainable transport system that can meet the short, medium and long term needs of a changing population, the economy and society."

To deliver the above, the Local Authority's key priorities are as follows:

- KP1: *"To support economic growth and safeguard jobs with a particular focus on City Regions, Enterprise Zones and local growth zones"*
- KP2: *"To reducing economic inactivity by delivering safe and affordable access to employment sites"*
- KP3: *"To maximise the contribution that effective and affordable transport services can make to transport poverty and target investment to support improvements in accessibility for the most disadvantaged communities* "; and
- KP4: *"Encourage safer, healthier and sustainable travel"*.

2.5 PREVAILING PARKING STANARDS

2.5.1 BRIDGEND COUNTY BOROUGH COUNCIL DESIGN GUIDES AND SUPPLEMENTARY PLANNING GUIDANCE (SPG) – SPG PARKING STANDARDS VOLUME 1 (2017)

Prevailing car and cycle standards are set out within Bridgend County Borough Council's Supplementary Planning Guidance for parking standards. The standards are based on the initial

guidance prepared by County Surveyors Society (CSS) Wales and adopted by the Local Authority in 2011. Parking standards are summarised in Table 2-1 and Table 2-2 below.

Table 2-1 – Bridgend County Borough Council Car Parking Standards

Land Use	Dwelling type	Parking Standard (Zones 2-6)
C3 – Residential (Dwelling houses)	Houses	Residents: 1 space per bedroom (maximum requirement 3 spaces) Visitors: 1 space per 5 units
	Apartments	

Table 2-2 – Bridgend County Borough Council Cycle Parking Standards

Land Use	Dwelling type	Cycle Parking Standard (Long Stay)	Cycle Parking Standard (Short Stay)
C3 – Residential (Dwelling houses)	Apartments	1 stand per 5 bedrooms	No requirement

2.6 SUMMARY

The policies identified and outlined within this chapter are those considered to be fundamental to the successful implementation of the proposed development from a transport perspective. The development proposals have been designed to comply with these policy requirements.

3 BASELINE CONDITIONS

3.1 INTRODUCTION

This chapter details the existing highway conditions surrounding the site and considers current highway safety conditions. It will also consider the existing sustainable transport opportunities including access to bus services, trains, and active travel infrastructure – i.e. walking and cycling.

3.2 LOCAL HIGHWAY NETWORK

Figure 3-1 shows the highway network in the vicinity of the site. The site is bound to the north and west by the A473 and to the south by Felindre Road. The B4280 and Penybont Road are within close proximity to the site and are accessed from the A473.

3.2.1 A473

To the north of the site, the A473 is a two-way single carriageway A road. at the A473 extends approximately 550m between the A472/B4280 roundabout and the A473/Penybont Road roundabout. This section of the highway has a posted 30mph speed limit.

To the West of the site the A473 is subject to the national speed limit. The carriageway at this location widens from a two-way single carriageway road to a dual carriageway on the approach to the A473/Felindre Road roundabout junction.

The A473 links Pontypridd and Bridgend, navigating through villages such as Llantwit Fadre and Llantrisant.

3.2.2 B4280

The B4280 is a two-way single carriageway B road connecting from the A473 in Pencoed to the A4061 in Bryncethin.

The B4280 is subject to the national speed limit from the roundabout junction with the A473 to Heol-y-Cyw at the priority junction of B4280 / High Street with B4280/Pant Hirwaun where it reduces to 40mph. The speed limit goes back to national speed limit after Heol-y-Cyw. The speed limit remains at the national speed limit until the junction with Heol Spencer on approach to Bryncethin where the speed limit reduces to 30mph.

3.2.3 PENYBONT ROAD

Penybont Road is a two-way single carriageway local access road connecting the A473 to Pencoed town centre. Penybont Road terminates at the junction with Heol-Y-Groes and Coychurch Road.

Penybont Road is subject to a 30mph speed limit for its duration.

Penybont Road provides direct access to residential dwellings, commercial land uses and restaurants. Pencoed train station can also be access from Penybont Road.

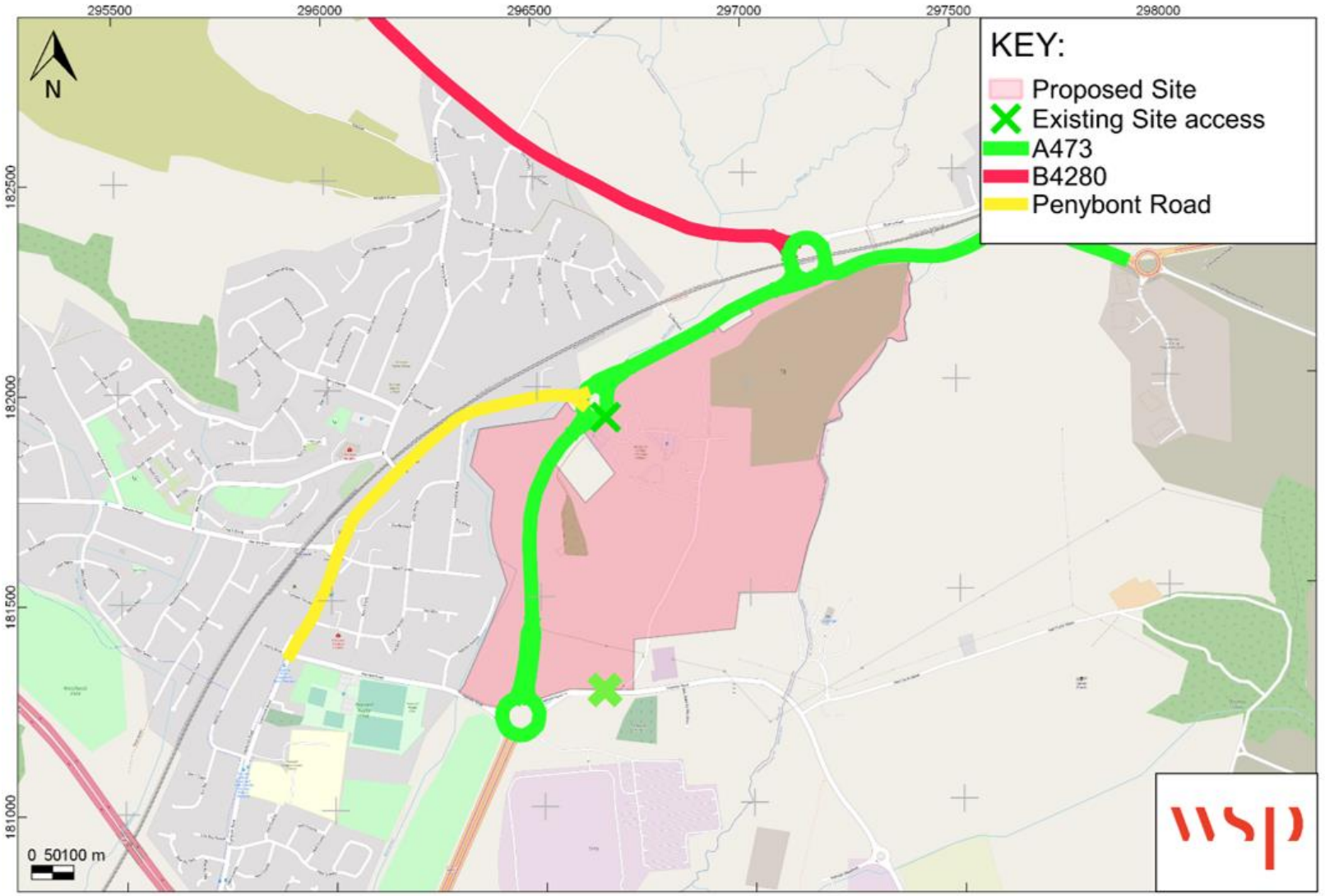
3.2.4 FELINDRE ROAD

Felindre Road is a two-way single carriageway local access road connecting the A473 in Pencoed to Pentre Meyrick in Cowbridge, south of the M4.

Felindre Road is subject to 40mph speed limit from the A473 to the point where the M4 passes over the road at which point the speed limit increases to the national speed limit. The national speed limit

remains in place until approximately 500m north of the road to St Mary Hill village, at which point it reduces to 40mph. At St Mary Hill Village the speed limit reduces further to 30mph and increases to 40mph again south of Llangan village. The speed limit increases again to the national speed limit at the junction with an unnamed road approximately 500m south of Llangan.

Figure 3-1 - Local Highway Network



3.3 EXISTING TRAFFIC CONDITIONS

3.3.1 JOURNEY TO WORK

Journey to work data has been obtained from 2011 Census data for residents within Pencoed. Table 3-1 shows the calculated modal split of journeys to work made by residents within Pencoed, Bridgend.

Table 3-1 – Journey to Work – Modal Split (Census 2011 – W02000226: Bridgend 009)

Method of Travel	Modal Split (%)
Underground/Metro/Light Rail/Tram	0%
Train	5%
Bus/Minibus/Coach	1%
Taxi	0%
Motorcycle	1%
Driver Car/Van	79%
Passenger Car/Van	6%
Bicycle	1%
Pedestrian	6%
Other	1%

It is considered that the modal split presented in Table 3-1 provides a robust assessment of trip mode distribution and that the uptake of sustainable travel modes has increased since 2011. It is also noted that due to the current circumstances around COVID-19 and the positive shift to acceptance of the flexibility of working from home longer term, it is believed that mode shifts will occur in future years and less people will travel for work daily. The effect of this is likely to be a reduction in movements by “Driver Car/Van”.

3.4 HIGHWAY SAFETY

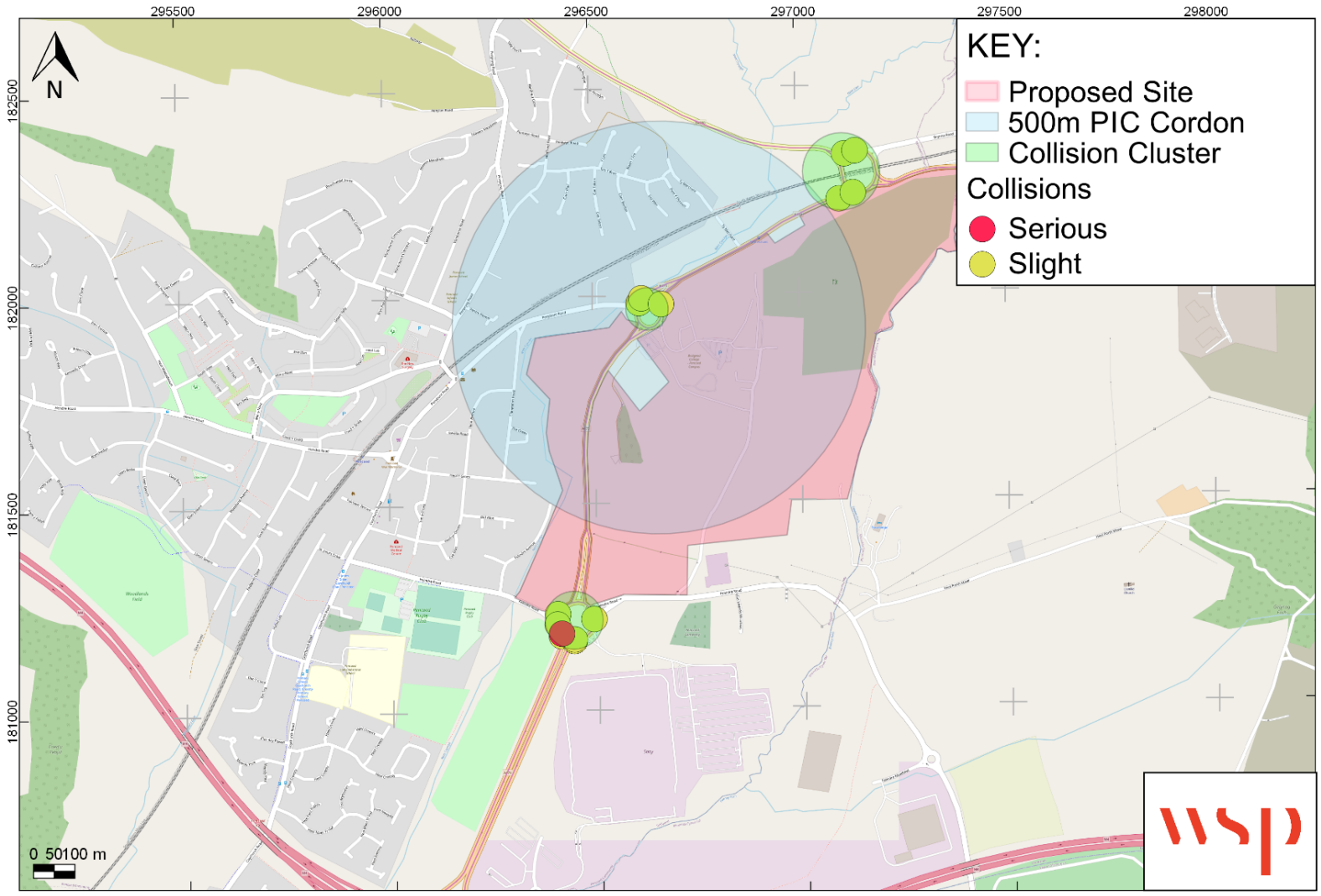
To assess existing highway safety, CrashMap has been interrogated to obtain Personal Injury Collision Data (PIC) within 500m of the existing site access. Table 3-2 provides a summary of the number and severity of collisions which have occurred within the most recent five (5) year period.

Table 3-2 – Personal Injury Collision Data

Casualty Type	Year					
	2014	2015	2016	2017	2018	2019
Fatal	0	0	0	0	0	0
Serious	0	0	0	1	0	0
Slight	0	3	1	2	5	3
Total	**0**	**3**	**1**	**3**	**5**	**3**

Figure 3-2 illustrates the area considered in the CrashMap interrogation, the location and severity of these collisions. A copy of the collision data can be found in Appendix A.

Figure 3-2 - Collision Clusters



A review of collision data available on CrashMap shows that there have been 14 slight and one (1) serious personal injury collision on the A473 in the vicinity of the development site.

The collisions are clustered at three (3) locations: A473/Penybont Road roundabout, A473/Felindre Road roundabout and A473/B4280 roundabout.

The cluster at the A473/Penybont Road roundabout comprises four (4) slight collisions. One collision involved a cyclist and all other collisions involved vehicles only. There is no trend in the type of collision at this location.

The cluster at the A473/Felindre Road roundabout comprises seven (7) collisions – six (6) slight and one (1) serious in severity. The serious collision involved a cyclist and a vehicle, with the injury occurring to the cyclist. The slight collisions were due to driver errors and there does not appear to be a trend in the collision type.

The cluster at the A473/B4280 roundabout junction comprises four (4) collisions, all slight in severity. One (1) collision involved a cyclist. There does not appear to be any trend in the collision type/cause.

The review of the PIC data does not identify any issues with the highway that could be exacerbated by any additional trips on the network. Therefore, it is the view of this TA that there are no inherent road safety issues in the immediate area surrounding the site.

3.5 PUBLIC TRANSPORT

3.5.1 BUS

The closest bus stops to the site are approximately 250 metres from the existing site access. One stop is located at Ty Merchant along the A473 to the north and the other at the College bus stop on Penybont Road to the west. Additional bus stops with a broader range of services can be found approximately one (1) kilometre from the site access in Pencoed town centre.

A summary of the bus services that are provided from the stops identified above is provided in Table 3-3. The table shows the approximate frequency of services, illustrating that there are relatively frequent public transport services stopping in the vicinity of the site, providing links to key areas in the surrounding area. Bus timetables are contained within Appendix B.

Table 3-3 – Bus Services

Service Number	Route	Approximate Frequency (Monday to Friday)	Approximate Frequency (Saturday and Sunday)
404	Pontypridd – Bridgend (Circular)	Hourly	Hourly on Saturday Sunday non-operational
62	Bridgend – Pencoed via Brackla (Circular)	Hourly	Saturday Hourly Sunday every two hours
64	Bridgend - Talbot Green via Brackla, Pencoed, Byrnna, Llanharan and Llanharry (Circular)	Hourly	Saturday Hourly Sunday every two hours
65	Bridgend – Talbot Green via Bryncethin, Heol-y-Cyw and Llanharan (Circular)	Hourly	2 services on Saturday Non-operational on Sunday
66	Heol-y-Cyw – Bridgend via Brackla and Pencoed (Circular)	Hourly	2 services Saturday Non-operational on Sunday

3.5.2 RAIL

Pencoed railway station is located approximately 900m walk to the south west of the site's existing access.

The railway station offers an hourly service which runs seven (7) days of the week. The service provides access to Cardiff Central to the east and to Bridgend to the west. Services at Pencoed railway station provide access to other destinations further afield, including Manchester Piccadilly and London Paddington, with changes at either Bridgend or Cardiff Central, and direct services to Milford Haven to the west.

The station does not offer any car or cycle parking. There is a park and ride within a one (1) kilometre walk from the railway station situated on Min-Y-Nant. There is currently no charge to use the car park, which has capacity for up to 56 vehicles.

The railway station offers step free access and a ticket machine.

3.6 ACTIVE TRAVEL

3.6.1 WALKING

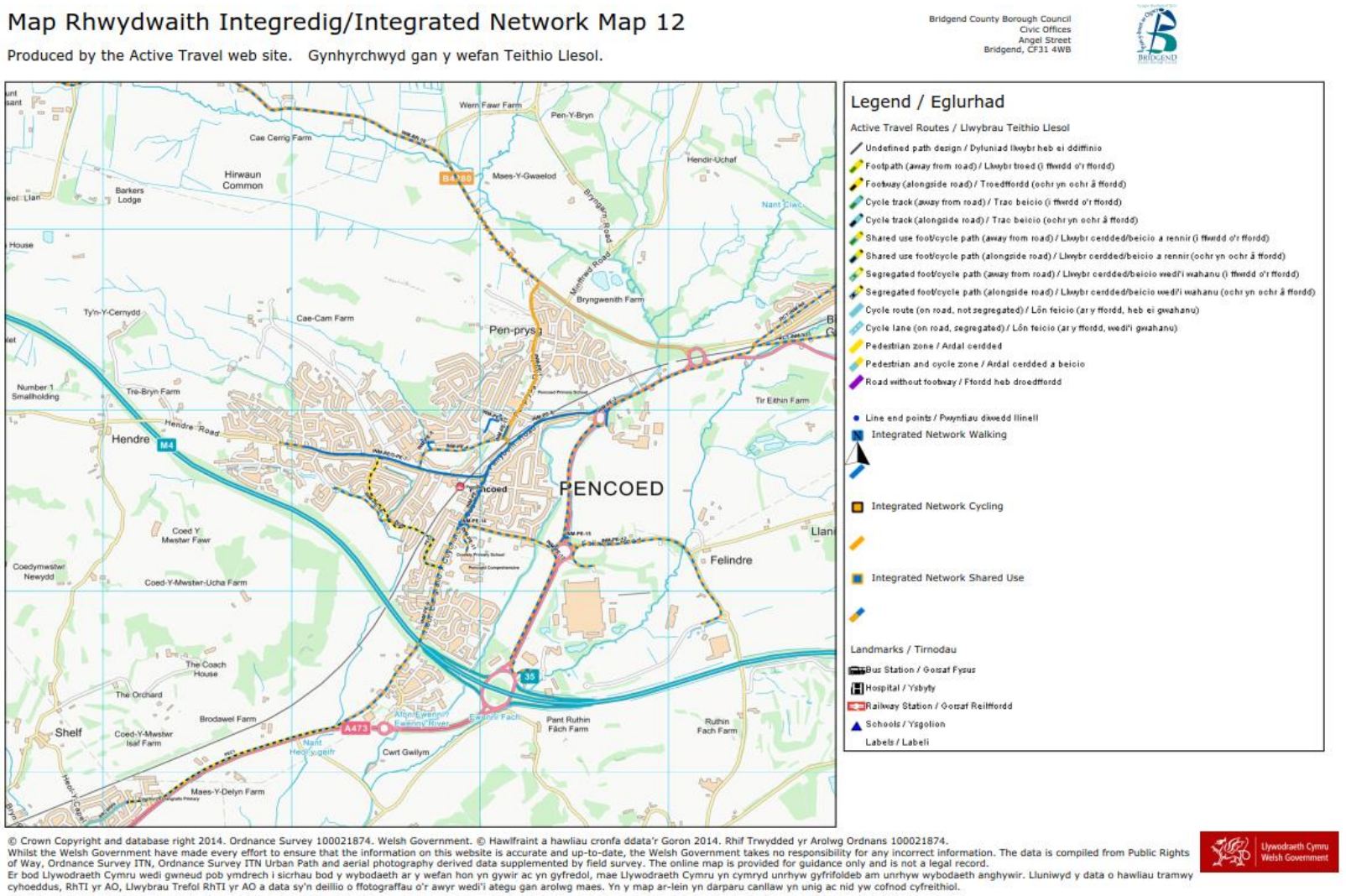
To the north of the site, footways are provided on either side of the carriageway along the A473. Tactile paving and dropped kerbs are provided within 500m of the existing site access to facilitate safe and convenient crossing for pedestrians.

To the west of the site along the A473, a narrow footway is provided on the western side of the carriageway and is segregated by grass verge.

Penybont Road, which leads to Pencoed town centre, offers footways on either side of the carriageway. These footways provide pedestrians with links from the site to key facilities, including but not limited to the railway station, post office and food stores.

South of the site there is a traffic free walking/cycling route which follows the curvature of Felindre Meadows. A traffic free walking/cycling route in Pencoed runs parallel with Coychurch Road and Woodlands Playing Field. The proximity of these routes can be seen in Figure 3-3 and maps of the routes can be found in **Appendix C**.

Figure 3-3 - Pencoed Active Travel Opportunities



3.6.2 CYCLING

There are currently no dedicated cycle lanes within the vicinity of the site.

The nearest National Cycle Network (NCN) Route to the development site can be found in Bridgend town centre. NCN Route 885 connects Bridgend with Afan Forest Park – a total distance of 12.4km, of which approximately 70% is traffic free.

3.7 INTEGRATED NETWORK MAPS

The introduction of the Active Travel (Wales) act in September 2014 placed responsibility on local authorities to set out active travel aspirations in the county by mapping and planning suitable routes.

These routes are put forward with the goal to make walking and cycling as convenient and as safe as possible for users of all ages and capabilities.

These planned routes were put forward in the form of an Integrated Network Map (INM) and were approved by Welsh Government in February 2017. The routes detailed within the submitted INM's are to be implemented over the next 15 years.

Proposals aim to achieve the following:

- Improve accessibility to key services and facilities such as town centres, transport hubs and employment/retail area;
- To develop access to educational facilities such as school and colleges; and
- Improve and expand the existing strategic network within Bridgend County Borough.

The table below summarises those proposed active travel route improvements which would directly improve the sustainability and permeability of the development site.

Table 3-4 - INM Proposals

Reference	Type	Proposal Description	Priority
INM-PE-2	Shared use	A shared off-road walking and cycling route along the site's northern boundary of the site from A473/Penybont roundabout to A473/B4280 roundabout	Long
INM-PE-8	Walking	A walking route from A473/Penybont roundabout through the centre of Pencoed along Penybont Road. Widened footway and dropped kerbs at suitable locations.	Short
INM-PE-12	Shared use	A shared walking and cycling route along the site's southern boundary on Felindre Road. An extension from the existing Pencoed commercial centre.	Medium
INM-PE-13	Shared Use	A shared off-road route from Pencoed College to employment at Junction 35 and Pencoed Technology Park	Short
INM-PE-14	Shared use	Improved crossing facilities for pedestrians at Coychurch Road/Felindre Road	Short
INM-PE.15	Shared use	Improved crossing facilities for pedestrians leading to Pencoed Technology Park	Short

Table 3-4 demonstrates an aspiration to improve the number and quality of active travel infrastructure in the immediate vicinity of the site.

INM-PE-8 particularly provides direct access to the train station in Pencoed along Penybont Road, negating the need to undertake a short distance private vehicle trip to the train station. Avoiding short distance vehicle trips is deemed crucial in avoiding the addition of unnecessary pressure to the existing road network.

As previously noted in section 3.5.2, Pencoed railway station provides users with a public transport access to key facilities within larger settlements such as Bridgend and Cardiff locally, and Manchester Piccadilly and London further afield.

Table 3-4 highlights that the proposed development benefits from being in the immediate vicinity of a number of dedicated active travel routes in Pencoed, therefore protecting and enhancing the sustainability and permeability credentials of the development site.

3.8 LOCAL FACILITIES AND AMENITIES

This section of the report considers the location of the site in relation to key local facilities, amenities and destinations that future residents may choose to use on a day-to-day basis. This assists in an assessment of the likely need to travel from the site by car.

Manual for Streets (MfS) guidance suggests that walkable neighbourhoods are typically characterised by having facilities located within 800m walking distance (approximately 10 minutes). However, MfS also states that 'this is not the upper limit and walking distances offers the greatest potential to replace short car trips, particular those under 2km'.

In addition to the above, the CIHT guidance on suggested acceptable walking distances set out in "Providing for Journeys on Foot, 2000" states that the average length of a walking journey is 1km (0.6 miles) and that this differs little by age.

The CIHT guidance acknowledges that "acceptable" walking distances will vary between individuals and circumstances. These identify "desirable", "acceptable" and "preferred maximum" distances as reproduced in Table 3-5.

Table 3-5 – Acceptable Walking Distances (MfS)

Distance Class	Town Centre (m)	Commuting / Education (m)	Elsewhere (m)
Desirable	200	500	400
Acceptable	400	1,000	800
Preferred Maximum	800	2,000	1,200

Differences in the propensity to walk by journey purpose may relate to individuals being more willing to walk further on foot to locations they have the greatest need to reach and/or where longer may be spent upon arrival (e.g. work or school).

An accessibility study has been undertaken to establish what facilities and amenities are available in the local area. The walk/cycle distances from the development to these facilities have been measured using existing footways, foot/cycle paths, footbridges and local roads (in case of cyclists).

Approximate walk times are based on the Institution of Highways and Transportation's guidance within the 'Providing Journeys on Foot' document, which states that an average walking speed of 1.4m/s can be assumed for most pedestrians. This measurement equates to approximately 400m every 5 minutes. The time required to cycle to a facility/amenity has been based on a "comfortable

cycle speed" of 4.44 metres per second (10 miles per hour) as suggested in Sustrans' 'Cycle Friendly Employers' Information Sheet.

Table 3-6 provides a summary of the local facilities and amenities and their respective distances, as well as the walk and cycle time from the application site. The table demonstrates that a significant number of facilities are located within walking and cycling distance from the application site. On this basis, it is reasonable to assume that there is significant opportunity for a number of these journeys to be undertaken by foot or bicycle.

Table 3-6 – Proximity to Local Facilities

Facility	Approximate Distance from Site (km)	Approximate Walk Time (mins)	Approximate Cycle Time (mins)
Public Transport			
Railway station	0.9	10	3
Nearest bus stop	0.25	3	1
Education			
Pencoed Primary	0.85	11	3
Pencoed Comprehensive	1.5	20	5
Health			
Pharmacy	0.75	10	3
Pencoed Clinic	1.1	13	3
Leisure			
Library	0.5	7	2
St. David's Church	0.9	11	3
Retail			
Post office	0.57	7	2
Co-Op Food	0.7	10	3
Tesco Express	0.95	13	4

3.9 SUMMARY

The site is within close proximity to major strategic routes in the area, including the A473 and B4280.

A review of collision data in the vicinity of the site demonstrates that there are no inherent safety issues with the highway that would be exacerbated with the addition of traffic associated with the development.

It is considered that the site is accessible by sustainable modes of transport. The surrounding area exhibits good levels of pedestrian and cycling infrastructure and there are a number of public transport opportunities located within minimal walking distance of the site. The site is also within walking distance from a range of key facilities, as well as public transport links.

A review of the INMs reveal that the development site is located in an area of Bridgend County Borough which is shown to be an area which will see a number of Active Travel routes introduced thereby enhancing the area's existing levels of active travel.

The development site is situated in a location which could integrate with the surrounding proposed active travel plans, thus demonstrating potential to promote the uptake of active travel for future residents.

4 DEVELOPMENT PROPOSAL

This chapter provides details of the proposed development, including a review of the proposed access arrangements for all modes of travel and car and cycle parking provision arrangements.

An illustrative masterplan for the proposed development has been prepared which presents the proposed vehicle, pedestrian and cycle points of access. For reference, this is included in Appendix D.

4.1 DEVELOPMENT PROPOSALS

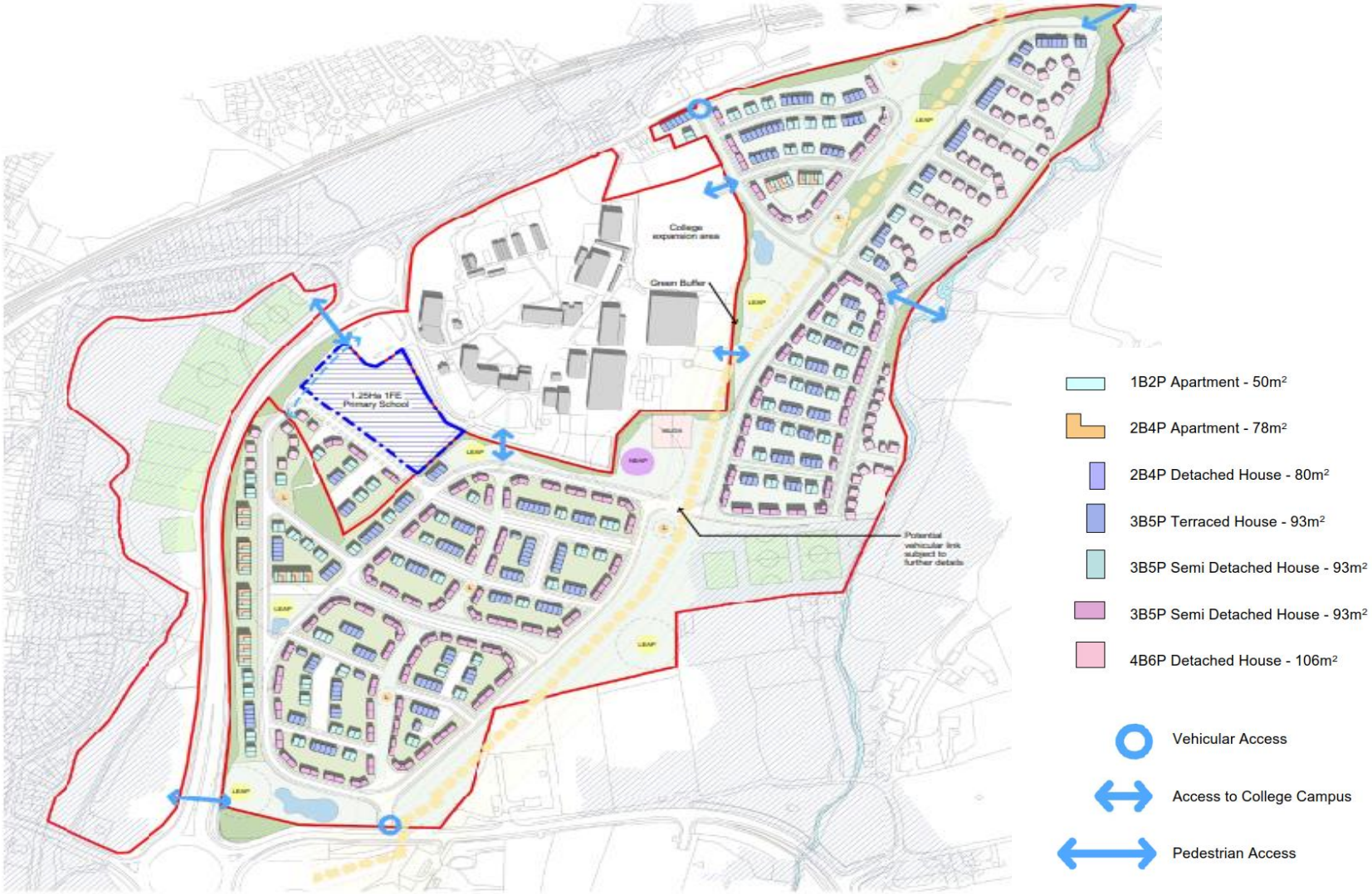
The site is being put to BCBC as a Candidate Site for development within its to be replaced Local Development Plan (LDP). The development of land adjacent to Bridgend College Pencoed Campus is intended to be for up to 770 dwellings – a mix of houses and flats. The site would also include a primary school and associated infrastructure and landscaping.

To build a vision for the site, a masterplan and land-use framework has been produced in order to inform the second and later stages of the Candidate Site Assessment. The proposed site has been identified in the LDP Preferred Strategy as a strategic site for development.

The vision for the site is to create a sustainable and well-connected community in Pencoed which responds to the Local Authority's housing needs. Ideas of placemaking heavily underpin the overall strategy.

The illustrative masterplan obtained from the Pencoed Campus Masterplan Design Report Document prepared by Austin-Smith:Lord (April 2020) can be seen in Figure 4-1 and is contained in Appendix D.

Figure 4-1 - Proposed Development Masterplan Drawing



4.2 ACCESS STRATEGY

4.2.1 VEHICLE ACCESS

The masterplan includes for two new vehicular access points onto the existing highway network. The access points are intended to be priority junctions with one onto the A473 at the northern extent of the site and the other onto Felindre Road at the southern extent of the site.

At the time of writing, detailed design of these junctions is intended to be finalised at a later stage.

4.2.1.1 SITE ACCESSES

In October 2018, Opus International Consultants Limited (Opus) produced a Transport Appraisal document to provide an overview of the transport context associated with the proposed development and land surrounding Pencoed Campus.

Part of the document appraised a number of potential access points into the site, including an access point to the north of the site off the A473 and a point of access to the south of the site off Felindre Road.

To inform the junction modelling to be undertaken, WSP have extracted the following junction arrangements from the access appraisal study conducted by Opus. Error! Reference source not f ound. and Error! Reference source not found. demonstrate the access options to be modelled for the A473 Site Access and Felindre Road Site Access, respectively.

Figure 4-2 - Proposed Site Access - A473

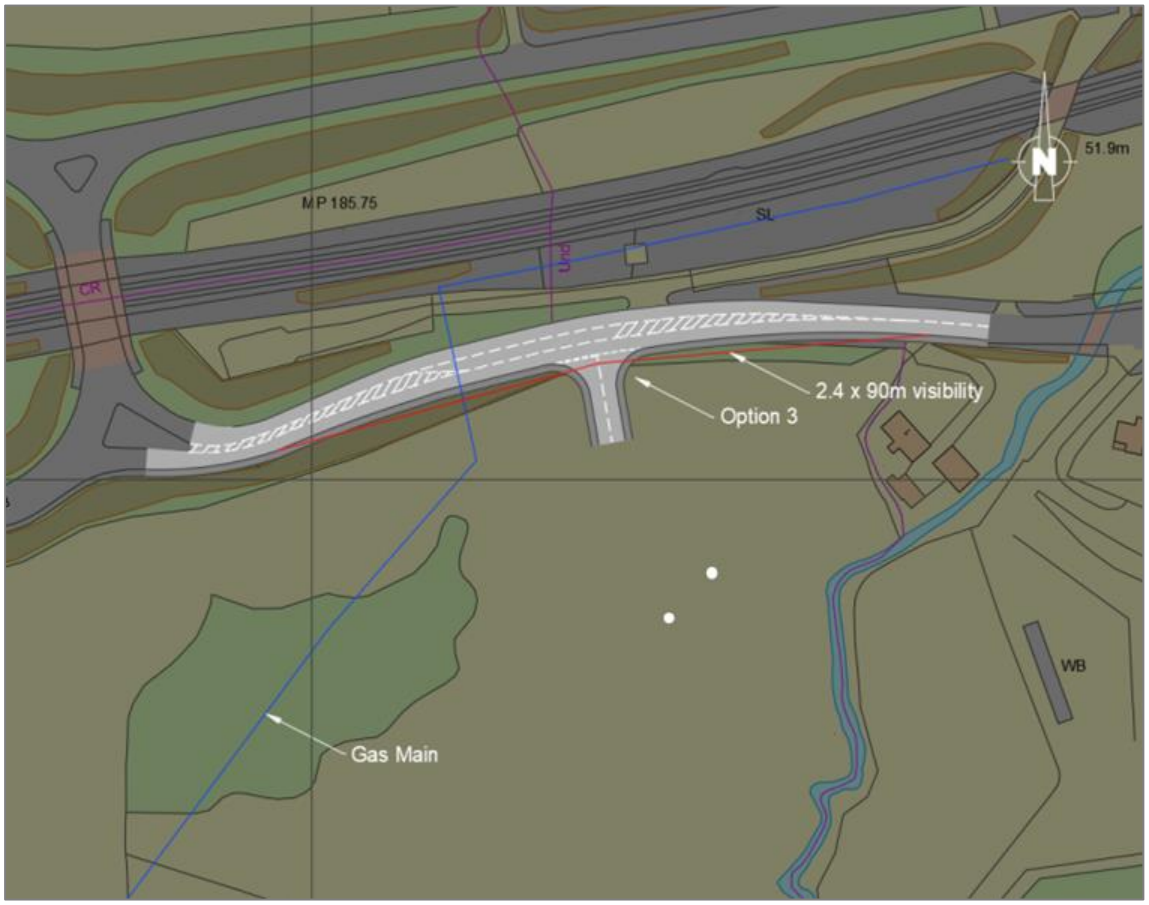
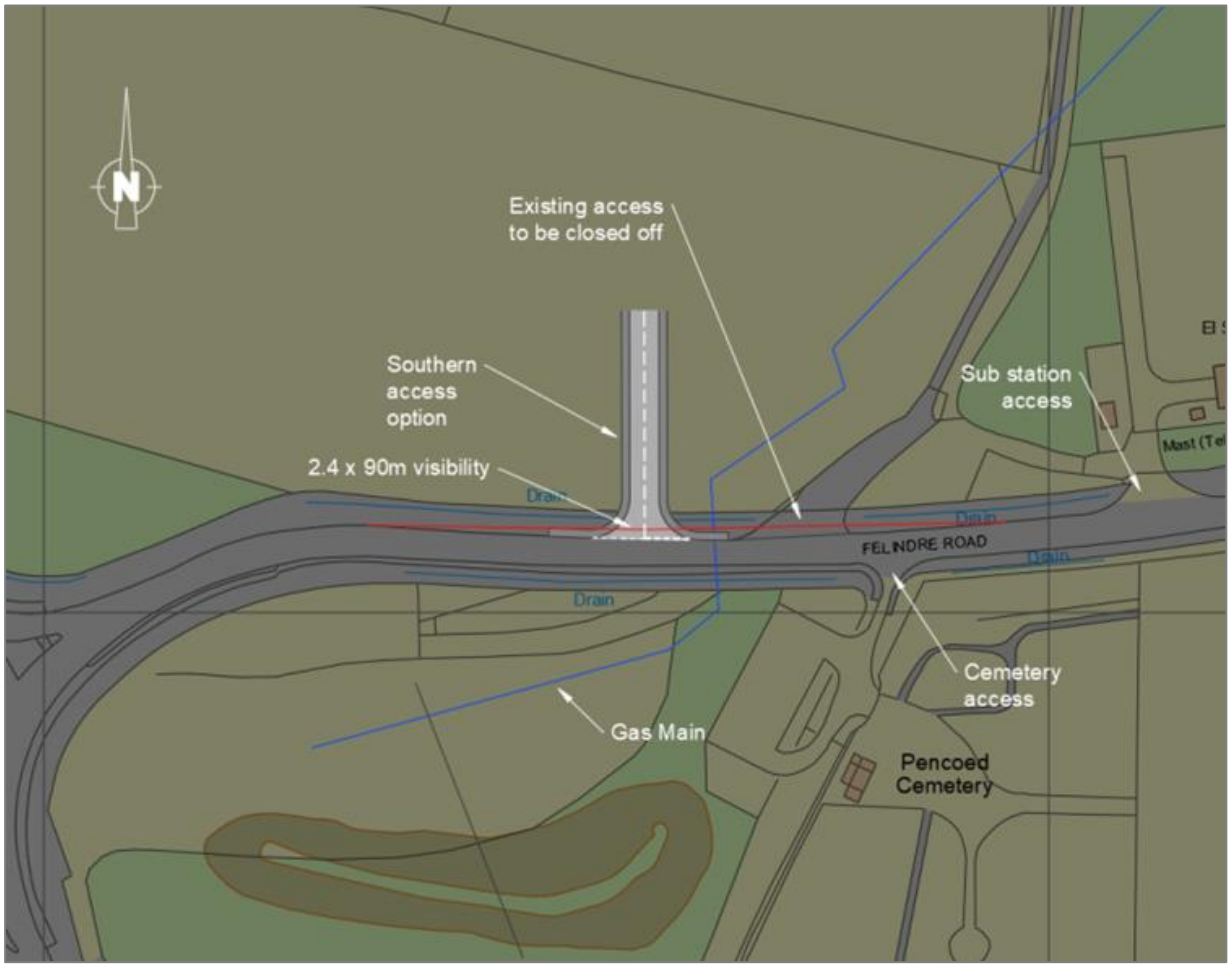


Figure 4-3 - Proposed Site Access - Felindre Road



4.2.2 CAR PARK LAYOUT

The layout of car parking areas has not yet been designed. The final layout will be prepared in line with design standards and BCBC car parking requirements.

4.2.3 PEDESTRIAN AND CYCLE ACCESS

As identified in the masterplan layout in Figure 4-1, a number of pedestrian access points are intended to be provided through the layout of the site. The masterplan shows that three (3) access points from the development site would be provided to the existing College campus.

The masterplan also indicates that pedestrian access would be provided at the north-east corner of the site to the A473.

A pedestrian access link will also be provided at the south-west corner of the site onto the A473.

A third pedestrian access would be provided at the A473 junction with Penybont Road at the location of the existing College Campus.

The masterplan also includes pedestrian links to existing PRoWs and footways.

All pedestrian and cycle links through the site would be built to standard and will be suitable to accommodate the needs of the development.

4.3 SUMMARY

Access to the site is subject to detailed design review and further planning. However, it is evident from the masterplan that the site will be designed to accommodate safe, suitable and convenient access for pedestrians and cyclists. Vehicular access to the site will be secondary and will be designed to encourage the uptake of sustainable transport modes by making these journeys faster and more attractive.

5 MULTIMODAL TRIP GENERATION

5.1 INTRODUCTION

This Chapter considers the effect of the proposed development on the local highway network. It details the methodology used to derive future year traffic flows in order to undertake future year impact assessments of the proposed development.

5.1.1 PROPOSED DEVELOPMENT TRIP GENERATION VEHICLE TRIPS

5.1.1.1 Private Dwellings

The trip generation has been calculated for the proposed site using comparative survey sites within the TRICS database. The following parameters were used in the TRICS interrogation to reflect the anticipated vehicle trips generated by the private residential element of the proposed development:

- 03 - Residential – K – Mixed Private Housing (Flats and Houses);
- 327 to 788 Units;
- Monday to Friday;
- South East and West, East Anglia, West Midlands, North England, Scotland and Wales;
- Suburban Area, Edge of Town, Neighbourhood Centre; and,
- Residential Zone and Village as Subcategory.

Vehicle trips generated by the proposed development have been derived using the standard network peak hours of 08:00 – 09:00 and 17:00 – 18:00. Anticipated vehicle trips generated by the proposed development can be seen in below. Full TRICS output can be seen in Appendix E.

Further, trip rates for the private element of the residential scheme have been derived using the notion of a 80% private and 20% affordable tenure split. Table 5-1 sets out the anticipated vehicle rates and associated trip generation profile for 616 private dwellings.

Table 5-1 – Mixed Private Dwellings – Vehicle Trips

	Trip Rate			Trip Generation		
Peak Hour	Arrival	Departure	Total	Arrival	Departure	Total
08:00 – 09:00	0.111	0.462	0.573	68	285	353
17:00 – 18:00	0.423	0.181	0.604	261	111	372

It is demonstrated Table 5-1 that the private housing element of the development would be expected to generate 353 two-way vehicle trips in the AM peak, and 372 two-way vehicle trips in the PM peak.

5.1.1.2 Affordable Dwellings

TRICS was also interrogated to obtain trip rates to establish the number of anticipated two-way vehicle trips generated by the affordable element of proposals. A 80% private and 20% affordable tenure split was assumed.

The following parameters were used in the TRICS interrogation to reflect the anticipated vehicle trips generated by the affordable residential element of the proposed development:

- 03 - Residential – K – Mixed Affordable Housing (Flats and Houses);
- 139 to 312 Units;

- Monday to Friday;
- South East and West, East Anglia, West Midlands, North England, Scotland and Wales;
- Suburban Area, Edge of Town, Neighbourhood Centre; and,
- Residential Zone and Village as Subcategory.

Vehicle trips generated by the proposed development have been derived using the standard network peak hours of 08:00 – 09:00 and 17:00 – 18:00. Anticipated vehicle trips generated by the proposed affordable housing element of the development can be seen in Table 5-2 for 154 units. Full TRICS output can be seen in Appendix E.

Table 5-2 – Mixed Affordable Dwellings – Vehicle Trips

	Trip Rate			Trip Generation		
Peak Hour	Arrival	Departure	Total	Arrival	Departure	Total
08:00 – 09:00	0.078	0.201	0.279	12	31	43
17:00 – 18:00	0.27	0.174	0.444	42	27	68

It is demonstrated in Table 5-2 that the affordable housing element of the development would be expected to generate 43 two-way vehicle trips in the AM peak, and 68 two-way vehicle trips in the PM peak.

5.1.1.3 Primary School Vehicle Trips

The proposed development consists of 770 residential houses, 80% private and 20% affordable housing, and 1 form of entry (1FE) primary school. Due to the size of the residential site and the proposed size of the primary school, it is the view of the TA that 60% of trips associated with the primary school would be internalised as it is typically accepted that 21 pupils are generated for every 100 dwellings, equal to 162 pupils. There are 210 places available in a 1FE primary school, this is calculated considering that there would be 30 pupils per year group and seven (7) year groups. On this basis, there would be 108 pupils arriving from outside the development.

It is considered that all pupils from the site would arrive by walking or cycling, on this basis, only pupils arriving from outside the development are considered for the vehicle trip generation.

TRICS was interrogated to obtain trip rates per pupil. The following parameters were used in the TRICS interrogation:

- 04- Education – A – Primary;
- 92 to 472 pupils;
- Monday to Friday;
- South West, East Anglia, West Midlands, North England, Scotland and Wales; and,
- Suburban Area, Edge of Town, Neighbourhood Centre, and Edge of Town Centre sites were selected.

Vehicle trips generated by the primary school have been derived using the standard network peak hours of 08:00 – 09:00 and 17:00 – 18:00. Anticipated vehicle trip rates and associated trip generation for 108 pupils can be seen in Table 5-3 . Full TRICS output can be seen in Appendix E.

Table 5-3 - Primary School – Vehicle Trips

	Trip Rate			Trip Generation		
Peak Hour	Arrival	Departure	Total	Arrival	Departure	Total
08:00 – 09:00	0.356	0.215	0.571	38	23	62
17:00 – 18:00	0.021	0.037	0.058	2	4	6

It is demonstrated in Table 5-3 that the primary school would be expected to generate 62 two-way vehicle trips in the AM peak, and 6 two-way vehicle trips in the PM peak.

5.1.1.4 Total Development Vehicle Trips

Table 5-4 provides a summary of the total vehicle trips for the proposed residential development.

Table 5-4 - Total Vehicle Trips

	Trip Generation		
Peak Hour	Arrival	Departure	Total
08:00 – 09:00	118	339	458
17:00 – 18:00	304	142	446

Table 5-4 demonstrates that the total residential development would be expected to generate 458 two-way vehicle trips in the AM peak, and 446 two-way vehicle trips in the PM peak.

5.1.2 PEAK HOUR MULTIMODAL TRIP GENERATION

As previously identified, it is considered that the modal split presented in the following sections provides a robust assessment of trip mode distribution and that the uptake of sustainable travel modes has increased since 2011. It is also noted that due to the current circumstances around COVID-19 and the positive shift to acceptance of the flexibility of working from home longer term, it is believed that mode shifts will occur in future years and less people will travel for work daily.

5.1.2.1 Private Dwellings

Table 5-5 sets out the anticipated multimodal trip generation during peak hours for the private housing element of the proposed scheme. The multimodal trip generation profile uses the percentage distribution of trip mode for commuters, as summarised in Section 3.3.

Table 5-5 – Mixed Private Dwellings – Multimodal Trip Generation

Mixed Private Dwellings				
	AM Peak		PM Peak	
	Total	% Trips	Total	% Trips
Underground, metro, light rail, tram	0	0%	0	0%
Train	22	5%	24	5%
Bus, minibus or coach	4	1%	5	1%
Taxi	0	0%	0	0%
Motorcycle, scooter or moped	4	1%	5	1%
Driving a car or van	353	79%	372	79%
Passenger in a car or van	27	6%	28	6%
Bicycle	4	1%	5	1%
On foot	27	6%	28	6%
Other method of travel to work	4	1%	5	1%
Total People Trips	447	100%	471	100%

Table 5-5 demonstrates that the private housing element of the proposed scheme is anticipated to generate 447 two-way people trips in the AM peak period, whilst a total of 471 two-way people trips are anticipated in the PM peak period.

As previously noted, in the AM peak there would be an anticipated 353 vehicle trips associated with the private dwellings and 372 vehicle trips in the PM peak.

Public transportation would comprise 26 vehicle trips in the AM peak and 24 in the PM peak. Of these, 22 would be by train and four (4) by bus in the AM and 24 by train and five (5) by bus in the PM.

It would be expected that 4 trips would be made by bicycle in the AM peak and 5 in the PM peak.

27 two-way trips would be made on foot in the AM peak and 28 in the PM peak.

Other modes of transport, including motorcycle/scooter/moped users, would comprise four (4) two-way trips in the AM peak and five (5) two-way vehicle trips in the PM peak.

5.1.2.2 Affordable Dwellings

Table 5-6 sets out the peak hour multimodal trip generation attributed to the affordable element of the residential scheme.

Table 5-6 – Mixed Affordable Dwellings – Multimodal Trip Generation

Mixed Affordable Dwellings				
	AM Peak		PM Peak	
	Total	% Trips	Total	% Trips
Underground, metro, light rail, tram	0	0%	0	0%
Train	3	5%	4	5%
Bus, minibus or coach	1	1%	1	1%
Taxi	0	0%	0	0%
Motorcycle, scooter or moped	1	1%	1	1%
Driving a car or van	43	79%	68	79%
Passenger in a car or van	3	6%	5	6%
Bicycle	1	1%	1	1%
On foot	3	6%	5	6%
Other method of travel to work	1	1%	1	1%
Total People Trips	54	100%	87	100%

It is demonstrated in Table 5-6 that the affordable housing element of the proposed scheme is anticipated to generate 54 two-way people trips in the AM peak period, whilst a total of 87 two-way people trips are anticipated in the PM peak period.

As previously noted, in the AM peak there would be an anticipated 43 vehicle trips associated with the private dwellings and 68 vehicle trips in the PM peak.

Public transportation would comprise four (4) vehicle trips in the AM peak and five (5) in the PM peak. Of these, three (3) would be by train and one (1) by bus in the AM and four (4) by train and one (1) by bus in the PM.

It would be expected that one (1) trips would be made by bicycle in the AM peak and one (1) in the PM peak.

Three (3) two-way trips would be made on foot in the AM peak and five (5) in the PM peak.

Other modes of transport, including motorcycle/scooter/moped users, would comprise one (1) two-way trips in the AM peak and one (1) two-way vehicle trips in the PM peak.

5.1.2.3 Primary School

Table 5-7 sets out the peak hour multimodal trip generation attributed to the primary school element of the scheme.

The table below was derived, as stated above, assuming 60% of trips associated with the primary school would be internalised which is equal to 162 pupils. In reality it is expected that the proportion of trips that would be from within the proposed development to the primary school will likely be higher than this. Internalised trips would be attributed to sustainable modes of travel, particularly walking and cycling and or as a passenger in a car. On this basis, there would be 108 pupils arriving from outside the development. Percentage distributions were derived from TRICS multi-modal outputs.

Table 5-7 - Primary School Multi-Modal Trip Generation

Primary School		
	AM Peak Total	PM Peak Total
Underground, metro, light rail, tram	0	0
Train	2	0
Bus, minibus or coach	26	0
Taxi	0	0
Motorcycle, scooter or moped	0	0
Driving a car or van	124	6
Passenger in a car or van	132	16
Bicycle	4	0
On foot	170	6
Other method of travel to work	0	0
Total People Trips	458	28

It is demonstrated in Table 5-7 that the primary school element of the proposed scheme is anticipated to generate 458 two-way people trips in the AM peak period, whilst a total of 28 two-way people trips are anticipated in the PM peak period.

As previously noted, in the AM peak there would be an anticipated 124 vehicle trips associated with the private dwellings and 6 vehicle trips in the PM peak.

Public transportation would comprise 28 trips in the AM peak and no trips in the PM peak. Of these, two (2) would be by train and 26 by bus in the AM.

It would be expected that four (4) trips would be made by bicycle in the AM peak and none in the PM peak.

170 two-way trips would be made on foot in the AM peak and 6 in the PM peak.

5.1.2.4 Total Development Multimodal Trip Generation

Table 5-8 sets out the peak hour multimodal trip generation for the whole scheme.

Table 5-8 - Total Development Multimodal Trip Generation

	AM Peak	PM Peak
	Total	Total
Underground, metro, light rail, tram	0	0
Train	27	28
Bus, minibus or coach	31	6
Taxi	0	0
Motorcycle, scooter or moped	5	6
Driving a car or van	520	446
Passenger in a car or van	162	50
Bicycle	9	6
On foot	200	40
Other method of travel to work	5	6
Total People Trips	959	586

It is demonstrated in Table 5-8 that the proposed scheme is anticipated to generate 959 two-way people trips in the AM peak period, whilst a total of 586 two-way people trips are anticipated in the PM peak period.

As previously noted, in the AM peak there would be an anticipated 520 vehicle trips associated with the private dwellings and 446 vehicle trips in the PM peak.

Public transportation would comprise 58 trips in the AM peak and 34 in the PM peak. Of these, 275 would be by train and 31 by bus in the AM and 28 by train and six (6) by bus in the PM.

It would be expected that nine (9) trips would be made by bicycle in the AM peak and six (6) in the PM peak.

200 two-way trips would be made on foot in the AM peak and 40 in the PM peak.

Other modes of transport, including motorcycle/scooter/moped users, would comprise five (5) two-way trips in the AM peak and six (6) two-way vehicle trips in the PM peak.

5.2 SUMMARY

The proposed development is expected to generate a total of 959 two-way people trips in the AM peak and 586 people trips in the PM peak.

Using 2011 Census Data, it was established that 79% of trips would be undertaken by vehicle and this would be equivalent to a total of 520 vehicle trips in the AM peak and 446 vehicle trips in the PM peak. It is considered that this is a worst-case scenario, particularly in light of recent circumstances surrounding COVID-19, which has seen a shift in how employers view working from home. It is likely that trips associated with commuting could see a decrease in future years. Any future planning application submission would include a sensitivity test to this effect.

Sustainable modes of transport make up the remaining trips. These comprise 58 and 34 public transport trips in the AM and PM peaks, respectively, nine (9) and six (6) two-way trips by cycling in both the AM and PM peaks and 200 and 40 walking trips in the AM and PM peaks, respectively.

6 TRAFFIC ASSESSMENT

6.1 INTRODUCTION

This chapter considers the impact of the proposed development on the local highway network.

6.2 ASSESSMENT YEARS

The TA will consider traffic volumes from the 2020 Base Year and the 2033 Horizon Year, in line with the proposed LDP Replacement period, as agreed with Bridgend County Borough Council. It should be noted that used of traffic data from 2015 and 2018 was agreed with BCBC and that this traffic data was used to establish a 2020 Base Year by applying growth factors taken from TEMPro.

6.3 TRAFFIC GROWTH

Traffic growth factors have been calculated using the Trip End Model Presentation Program (TEMPro) version 7.2 growth factors. TEMPro allows users to access National Trip End Model (NTEM) datasets to review travel forecasts, which forecast the growth in trip origin-destinations for use in traffic modelling. Forecasts use national projections of a range of socio-economic factors such as population, housing, employment, car ownership and trip rates.

The growth rates used for traffic forecasting were produced from the following criteria:

- Area: Bridgend County Borough Council 009;
- Output type: Middle Layer Output Area;
- Country: Wales

TEMPro used the 2015 National Transport Model (NTM), which includes data from 2010-2040, and in doing so has taken into consideration any the anticipated traffic generated by developments in the local area likely to impact the proposed development.

Calculated growth factors for Bridgend 009 in the AM and PM peak are set out in Table 6-1 below.

Table 6-1 – TEMPro Growth Factors Base year 2020 – 2031 and 2020 – 2033

Period	Time	Origin	Destination	Average
2015 – 2020	07:00 – 09:59	1.0215	1.0274	1.0245
	16:00 – 18:59	1.0259	1.0223	1.0241
2018 – 2020	07:00 – 09:59	1.0149	1.0181	1.0165
	16:00 – 18:59	1.0170	1.0151	1.0161
2020 – 2031	07:00 – 09:59	1.0474	1.0679	1.0577
	16:00 – 18:59	1.0647	1.0509	1.0578
2020 - 2033	07:00 – 09:59	1.0546	1.0798	1.0672
	16:00 – 18:59	1.0756	1.0586	1.0671

6.4 TRAFFIC FLOWS

This section will include a series of tables which provide a summary of the vehicle flows for both the AM and PM peak hours for 2020, 2031 and 2033 assessments scenarios.

Traffic surveys were undertaken from 12 October 2020 to 19 October 2020 and were undertaken as follows:

- Automatic Traffic Count survey (ATC) on the A473 to the north-east of the proposed site; and,
- ATC survey on Felindre Road to the south of the proposed site.

Also, in order to assess the impact of the Development on other junctions in the vicinity of the Site, additional traffic data has been interrogated. This comprises of:

- 2018 Junction Turning Count (JTC) survey data, obtained from the Steam Academy Transport Assessment;
- 2015 South East Wales Transport Model (SEWTM) output; and,
- 2020 JTC survey data provided by the BCBC.

To account for traffic levels pre COVID-19, a 30% traffic increase has been applied to 2020 survey results to represent a worst-case scenario. This represents a worst-case scenario and it is anticipated that revised traffic counts would be undertaken before the submission of a planning application to determine the approach to mitigation works. This proposed uplift in traffic is due to the period which the surveys were undertaken. The dates, 12-19 October 2020, occurred during a local lockdown introduced for BCBC which meant that residents were 'not allowed to enter or to leave or remain away from the Bridgend County Borough area without a reasonable excuse'. On this basis, it was expected that there would be a certain reduction in traffic volumes as a consequence of the lockdown.

6.4.1 NORTHERN ACCESS TRAFFIC FLOWS

The tables that follow provide a summary of the 2020 Base Year traffic flows, 2031 and 2033 Horizon Year Base traffic flows and the 2031 and 2033 Horizon Year with development traffic flows for both the AM and PM peak hours for the proposed site access junction onto the A473.

Table 6-2 provides a summary of the 2020 Baseline Flows for the A473 with the 30% uplift to account for reductions due to COVID-19.

Table 6-2 –2020 Base Year Traffic Flows

	A (A473 East)	B (Site Access)	C (A473 West)	TOTAL
AM				
A (A473 East)	0	0	393	*393*
B (Site Access)	0	0	0	*0*
C (A473 West)	512	0	0	*512*
Total	*512*	*0*	*393*	*904*
PM				
A (A473 East)	0	0	464	*464*
B (Site Access)	0	0	0	*0*
C (A473 West)	418	0	0	*418*
Total	*418*	*0*	*464*	*882*

Table 6-3 provides a summary of the 2031 Baseline Flows for the A473. The flows were calculated by applying growth factors obtained from TEMPro to the 2020 traffic flows in Table 6-2.

Table 6-3 – 2031 Horizon Year Traffic Flows

	A (A473 East)	B (Site Access)	C (A473 West)	TOTAL
AM				
A (A473 East)	0	0	416	*416*
B (Site Access)	0	0	0	*0*
C (A473 West)	541	0	0	*541*
Total	*541*	*0*	*416*	*957*
PM				
A (A473 East)	0	0	491	*491*
B (Site Access)	0	0	0	*0*
C (A473 West)	442	0	0	*442*
Total	*442*	*0*	*491*	*933*

Table 6-4 provides a summary of the traffic flows for the 2031 Baseline with Development scenario. These traffic flows include the 2031 Baseline Flows in addition to the proposed development traffic.

Table 6-4 – 2031 Horizon Year Traffic Flows with Development

	A (A473 East)	B (Site Access)	C (A473 West)	TOTAL
AM				
A (A473 East)	0	26	416	*441*
B (Site Access)	96	0	74	*170*
C (A473 West)	541	33	0	*574*
Total	*637*	*59*	*489*	*1185*
PM				
A (A473 East)	0	80	491	*571*
B (Site Access)	34	0	37	*71*
C (A473 West)	442	72	0	*514*
Total	*476*	*152*	*528*	*1156*

Table 6-5 provides a summary of the 2033 Baseline Flows for the A473. The flows were calculated by applying growth factors obtained from TEMPro to the 2020 traffic flows in Table 6-2.

Table 6-5 - 2033 Horizon Year Traffic Flows

	A (A473 East)	B (Site Access)	C (A473 West)	TOTAL
AM				
A (A473 East)	0	0	419	*419*
B (Site Access)	0	0	0	*0*
C (A473 West)	546	0	0	*546*
Total	*546*	*0*	*419*	*965*
PM				
A (A473 East)	0	0	495	*495*
B (Site Access)	0	0	0	*0*
C (A473 West)	446	0	0	*446*
Total	*446*	*0*	*495*	*941*

Table 6-6 provides a summary of the traffic flows for the 2033 Baseline with Development scenario. These traffic flows include the 2033 Baseline Flows in addition to the proposed development traffic.

Table 6-6 - 2033 Horizon Year Traffic Flows with Development

	A (A473 East)	B (Site Access)	C (A473 West)	TOTAL
AM				
A (A473 East)	0	26	419	*445*
B (Site Access)	96	0	74	*170*
C (A473 West)	546	33	0	*579*
Total	*642*	*59*	*493*	*1194*
PM				
A (A473 East)	0	80	495	*575*
B (Site Access)	34	0	37	*71*
C (A473 West)	446	72	0	*518*
Total	*480*	*152*	*532*	*1164*

6.4.2 SOUTHERN ACCESS TRAFFIC FLOWS

The tables that follow provide a summary of the 2020 Base Year traffic flows, 2031 and 2033 Horizon Year Base traffic flows and the 2031 and 2033 Horizon Year with Development traffic flows for both the AM and PM peak hours for the proposed site access junction onto Felindre Road.

Table 6-7 provides a summary of the 2020 Baseline Flows for Felindre Road with the 30% uplift to account for reductions due to COVID-19.

Table 6-7 – 2020 Base Year Flows

	A (Felindre Road West)	B (Site Access)	C (Felindre Road East)	TOTAL
AM				
A (Felindre Road West)	0	0	516	*516*
B (Site Access)	0	0	0	*0*
C (Felindre Road East)	361	0	0	*361*
Total	*361*	*0*	*516*	*877*
PM				
A (Felindre Road West)	0	0	306	*306*
B (Site Access)	0	0	0	*0*
C (Felindre Road East	517	0	0	*517*
Total	*517*	*0*	*306*	*823*

Table 6-8 provides a summary of the 2031 Horizon Year Traffic Flows for Felindre Road. The flows were calculated by applying growth factors obtained from TEMPro to the 2020 traffic flows in Table 6-7.

Table 6-8 –2031 Horizon Year Traffic Flows

	A (Felindre Road West)	B (Site Access)	C (Felindre Road East)	TOTAL
AM				
A (Felindre Road West)	0	0	546	*546*
B (Site Access)	0	0	0	*0*
C (Felindre Road East)	382	0	0	*382*
Total	*382*	*0*	*546*	*928*
PM				
A (Felindre Road West)	0	0	323	*323*
B (Site Access)	0	0	0	*0*
C (Felindre Road East	547	0	0	*547*
Total	*547*	*0*	*323*	*870*

Table 6-9 provides a summary of the traffic flows for the 2031 Baseline with Development scenario. These traffic flows include the 2031 Baseline Flows in addition to the proposed development traffic.

Table 6-9 – 2031 Horizon Year Traffic Flows with Development

	A (Felindre Road West)	B (Site Access)	C (Felindre Road East)	TOTAL
AM				
A (Felindre Road West)	0	35	546	*581*
B (Site Access)	70	0	100	*170*
C (Felindre Road East)	382	24	0	*406*
Total	*452*	*59*	*646*	*1157*
PM				
A (Felindre Road West)	0	56	323	*379*
B (Site Access)	45	0	26	*71*
C (Felindre Road East	547	96	0	*643*
Total	*592*	*152*	*349*	*1093*

Table 6-10 provides a summary of the 2033 Horizon Year Traffic Flows for Felindre Road. The flows were calculated by applying growth factors obtained from TEMPro to the 2020 traffic flows in Table 6-7.

Table 6-10 - 2033 Horizon Year Traffic Flows

	A (Felindre Road West)	B (Site Access)	C (Felindre Road East)	TOTAL
AM				
A (Felindre Road West)	0	0	551	*551*
B (Site Access)	0	0	0	*0*
C (Felindre Road East)	386	0	0	*386*
Total	*386*	*0*	*551*	*937*
PM				
A (Felindre Road West)	0	0	326	*326*
B (Site Access)	0	0	0	*0*
C (Felindre Road East	552	0	0	*552*
Total	*552*	*0*	*326*	*878*

Table 6-11 provides a summary of the traffic flows for the 2033 Baseline with Development scenario. These traffic flows include the 2033 Baseline Flows in addition to the proposed development traffic.

Table 6-11 - 2033 Horizon Year Traffic Flows with Development

	A (Felindre Road West)	B (Site Access)	C (Felindre Road East)	TOTAL
AM				
A (Felindre Road West)	0	35	551	*586*
B (Site Access)	70	0	100	*170*
C (Felindre Road East)	386	24	0	*755*
Total	*456*	*59*	*651*	*1166*
PM				
A (Felindre Road West)	0	56	326	*382*
B (Site Access)	45	0	26	*71*
C (Felindre Road East	552	96	0	*648*
Total	*597*	*152*	*352*	*1101*

6.4.3 JUNCTION 1 – BRIDGEND B4280 / BRYNNA ROAD / A473 / PENYBONT ROAD ROUNDABOUT

The tables that follow provide a summary of the 2020 Base Year traffic flows, 2033 Horizon Year Base traffic flows and the 2033 Horizon Year with development traffic flows for both the AM and PM peak hours for key junctions surrounding the site (Junctions 1 to 7 shown in the following sections of this report).

Table 6-12 provides a summary of the 2020 Baseline Flows for Junction 1. For information, the junction is presented as per Figure 6-1.

Figure 6-1 - Junction 1 - Arm Assignment

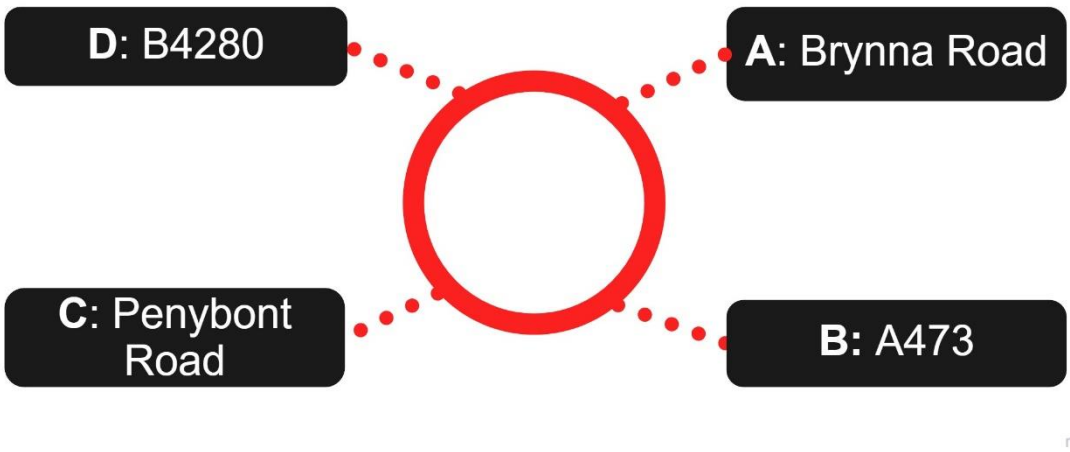


Table 6-12 – Junction 1: 2020 Base Year

	A	B	C	D	TOTAL
AM					
A	-	23	254	57	*335*
B	17	-	710	75	*802*
C	94	331	-	110	*534*
D	27	88	213	-	*328*
Total	*138*	*442*	*1,177*	*242*	*1,999*
PM					
A	-	11	100	47	*159*
B	12	-	357	111	*481*
C	217	568	-	186	*971*
D	45	75	122	-	*242*
Total	*274*	*654*	*580*	*344*	*1,852*

Table 6-13 provides a summary of the traffic flows for the 2033 Horizon Year scenario.

Table 6-13 - Junction 1: 2033 Horizon Year Traffic Flows

	A	B	C	D	TOTAL
AM					
A	-	25	271	61	*357*
B	18	-	758	80	*856*
C	100	353	-	117	*570*
D	29	94	227	-	*350*
Total	*147*	*471*	*1,256*	*259*	*2,133*
PM					
A	-	12	107	50	*169*
B	13	-	381	119	*513*
C	232	606	-	198	*1,036*
D	48	80	131	-	*259*
Total	*293*	*698*	*618*	*367*	*1,977*

Table 6-14 provides a summary of the traffic flows for the 2033 Horizon Year with Development scenario. These traffic flows include the 2033 Baseline Flows in addition to the proposed development traffic.

Table 6-14 - Junction 1: 2033 Horizon Year Traffic Flows with Development

	A	B	C	D	TOTAL
AM					
A	-	26	273	61	*360*
B	21	-	847	89	*956*
C	103	382	-	121	*606*
D	29	99	228	-	*356*
Total	*152*	*507*	*1,348*	*271*	*2,279*
PM					
A	-	13	108	50	*172*
B	14	-	411	127	*552*
C	246	712	-	210	*1,168*
D	48	90	132	-	*270*
Total	*307*	*815*	*652*	*387*	*2,161*

6.4.4 JUNCTION 2 - BRIDGEND A473 / PENYBONT ROAD / PENCOED CAMPUS ROUNDABOUT

Table 6-15 provides a summary of the 2020 Baseline Flows for Junction 2. For information, the junction is presented as per Figure 6-2.

Figure 6-2 - Junction 2 - Arm Assignment

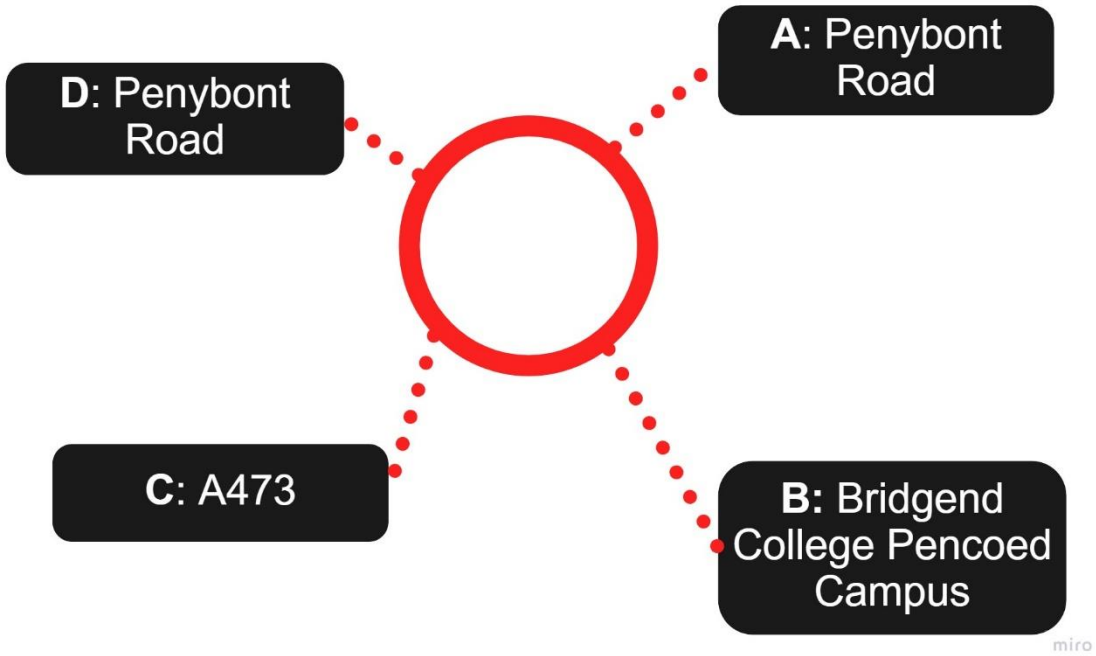


Table 6-15 – Junction 2: 2020 Base Year

	A	B	C	D	TOTAL
AM					
A	-	68	992	131	1,191
B	14	-	74	8	97
C	380	193	-	56	629
D	120	13	108	-	241
Total	514	274	1,174	195	2,157
PM					
A	-	14	469	103	*586*
B	13	-	36	1	*50*
C	830	21	-	96	*947*
D	126	1	55	-	*183*
Total	*969*	*36*	*559*	*201*	*1,765*

Table 6-16 provides a summary of the traffic flows for the 2033 Horizon Year scenario.

Table 6-16 - Junction 2: 2033 Horizon Year Traffic Flows

	A	B	C	D	TOTAL
AM					
A	-	72	1,059	139	*1,271*
B	15	-	79	9	*103*
C	405	206	-	60	*671*
D	128	14	115	-	*257*
Total	*548*	*293*	*1,253*	*208*	*2,302*
PM					
A	-	15	500	110	*625*
B	14	-	38	1	*53*
C	885	22	-	103	*1,010*
D	135	1	59	-	*195*
Total	*1,034*	*38*	*597*	*214*	*1,883*

Table 6-17 provides a summary of the traffic flows for the 2033 Horizon Year with Development scenario. These traffic flows include the 2033 Baseline Flows in addition to the proposed development traffic.

Table 6-17 - Junction 2: 2033 Horizon Year Traffic Flows with Development

	A	B	C	D	TOTAL
AM					
A	-	78	1,143	150	*1,370*
B	16	-	80	9	*104*
C	436	215	-	63	*714*
D	132	14	116	-	*262*
Total	*584*	*307*	*1,339*	*221*	*2,450*
PM					
A	-	15	535	116	*667*
B	15	-	39	1	*55*
C	1,007	24	-	110	*1,141*
D	144	1	60	-	*205*
Total	*1,166*	*40*	*634*	*228*	*2,068*

6.4.5 JUNCTION 3 - BRIDGEND A473 / VELINDRE ROAD / PENCOED TECHNOLOGY PARK ROUNDABOUT

Table 6-18 provides a summary of the 2020 Baseline Flows for Junction 3. For information, the junction is presented as per Figure 6-3.

Figure 6-3 - Junction 3 - Arm Assignment

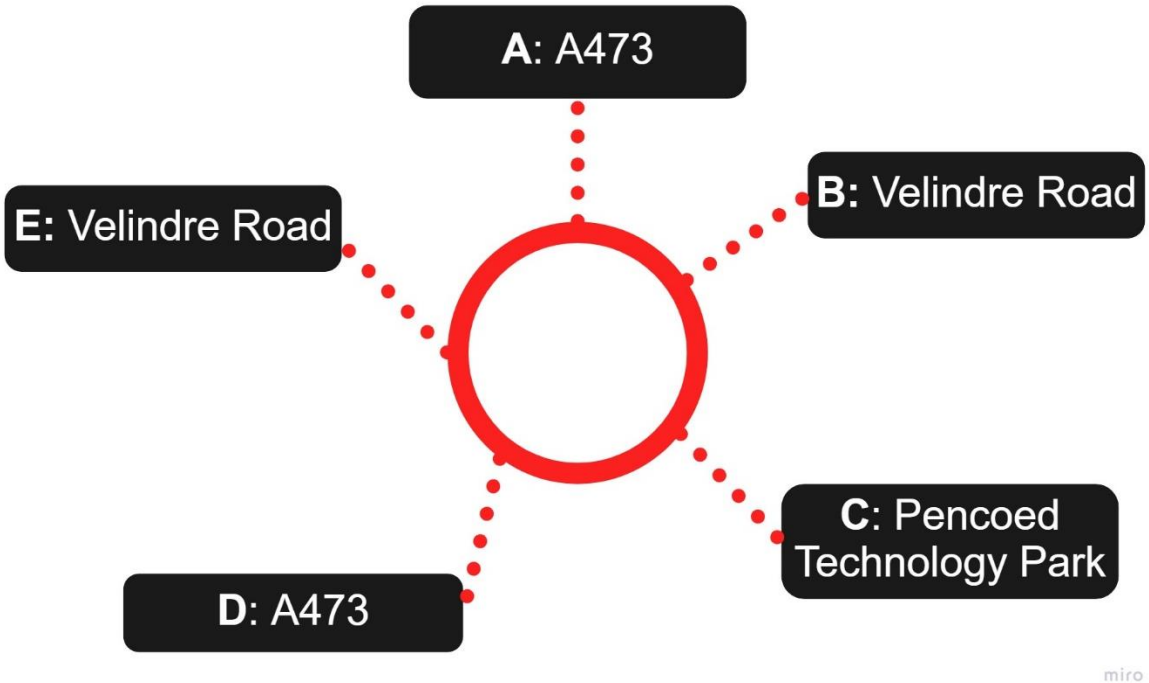


Table 6-18 - Junction 3: 2020 Base Year

	A	B	C	D	E	TOTAL
AM						
A	-	130	38	931	56	1,155
B	80	-	14	260	44	398
C	-	6	-	24	1	31
D	501	330	91	-	118	1,040
E	26	56	51	202	-	335
Total	608	521	194	1,418	219	2,960
PM						
A	-	63	5	464	31	*563*
B	118	-	1	268	49	*436*
C	26	38	-	147	7	*219*
D	732	210	9	-	211	*1,162*
E	61	44	8	111	-	*223*
Total	*937*	*355*	*23*	*990*	*298*	*2,602*

Table 6-19 provides a summary of the traffic flows for the 2033 Horizon Year scenario.

Table 6-19 - Junction 3: 2033 Horizon Year Traffic Flows

	A	B	C	D	E	TOTAL
AM						
A	-	139	41	995	60	1,235
B	85	-	15	277	47	425
C	-	7	-	26	1	34
D	536	352	97	-	126	1,112
E	28	60	54	216	-	358
Total	649	557	207	1,515	234	3,163
PM						
A	-	67	5	494	33	600
B	126	-	1	286	52	464
C	28	41	-	157	8	233
D	780	224	10	-	225	1,239
E	65	47	8	118	-	238
Total	999	378	25	1,055	318	2,774

Table 6-20 provides a summary of the traffic flows for the 2033 Horizon Year with Development scenario. These traffic flows include the 2033 Baseline Flows in addition to the proposed development traffic.

Table 6-20 - Junction 3: 2033 Horizon Year Traffic Flows with Development

	A	B	C	D	E	TOTAL
AM						
A	-	156	43	1,057	63	1,320
B	101	-	18	323	55	497
C	-	7	-	26	1	34
D	548	374	97	-	126	1,146
E	29	63	54	216	-	363
Total	678	601	212	1,623	246	3,359
PM						
A	-	80	6	516	35	637
B	145	-	1	313	57	516
C	30	47	-	157	8	241
D	827	257	10	-	225	1,319
E	68	54	8	118	-	*248*
Total	*1,070*	*437*	*25*	*1,105*	*324*	*2,961*

6.4.6 JUNCTION 4 - BRIDGEND M4 J35 ROUNDABOUT (INCLUDING MOTORWAY ON-SLIPS AND OFF-SLIPS) (PARTIALLY SIGNALISED)

Table 6-21 provides a summary of the 2020 Baseline Flows for Junction 4. For information, the junction is presented as per Figure 6-4.

Figure 6-4 - Junction 4 - Arm Assignment

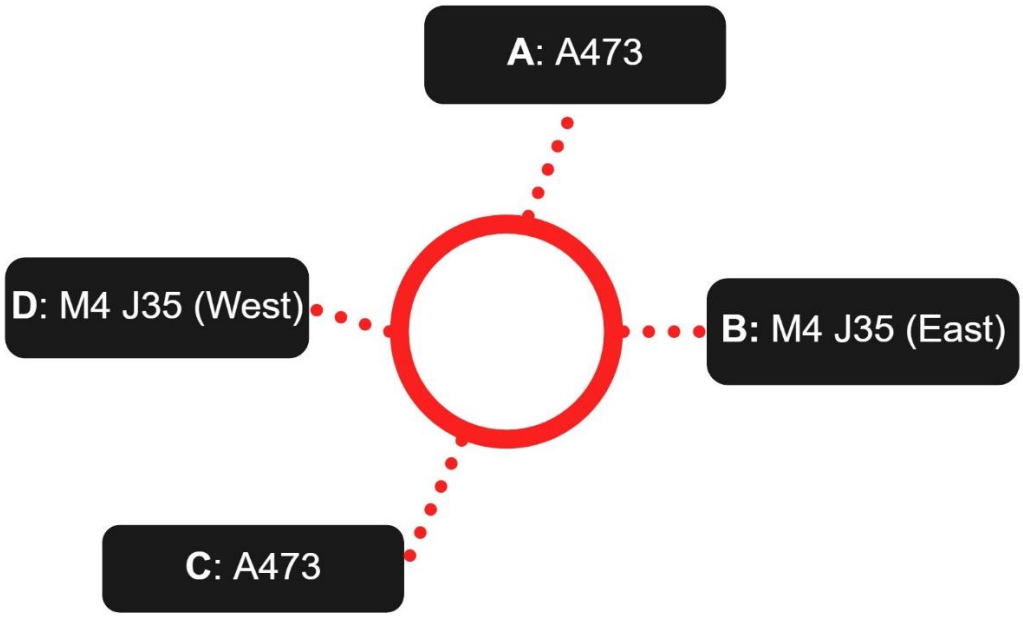


Table 6-21 - Junction 4: 2020 Base Year

	A	B	C	D	TOTAL
AM					
A					*919*
B					*1,714*
C					*1,633*
D					*442*
Total	*843*	*1,562*	*1,962*	*341*	*4,707*
PM					
A					*612*
B					*1,797*
C					*1,674*
D					*268*
Total	*931*	*1,406*	*1,694*	*321*	*4,352*

Table 6-22 provides a summary of the traffic flows for the 2033 Horizon Year scenario.

Table 6-22 - Junction 4: 2033 Horizon Year Traffic Flows

	A	B	C	D	TOTAL
AM					
A					*981*
B					*1,829*
C					*1,743*
D					*471*
Total	*900*	*1,667*	*2,094*	*364*	*5,024*
PM					
A					*654*
B					*1,918*
C					*1,787*
D					*286*
Total	*993*	*1,500*	*1,808*	*342*	*4,645*

Table 6-23 provides a summary of the traffic flows for the 2033 Horizon Year with Development scenario. These traffic flows include the 2033 Baseline Flows in addition to the proposed development traffic.

Table 6-23 - Junction 4: 2033 Horizon Year Traffic Flows with Development

	A	B	C	D	TOTAL
AM					
A					*1,088*
B					*1,844*
C					*1,757*
D					*475*
Total	*933*	*1,711*	*2,148*	*374*	*5,165*
PM					
A					*703*
B					*1,956*
C					*1,823*
D					*292*
Total	*1,073*	*1,521*	*1,832*	*347*	*4,774*

6.4.7 JUNCTION 5 - BRIDGEND BOCAM PARK ROUNDABOUT

Table 6-24 provides a summary of the 2020 Baseline Flows for Junction 5. For information, the junction is presented as per Figure 6-5.

Figure 6-5 - Junction 5 - Arm Assignment

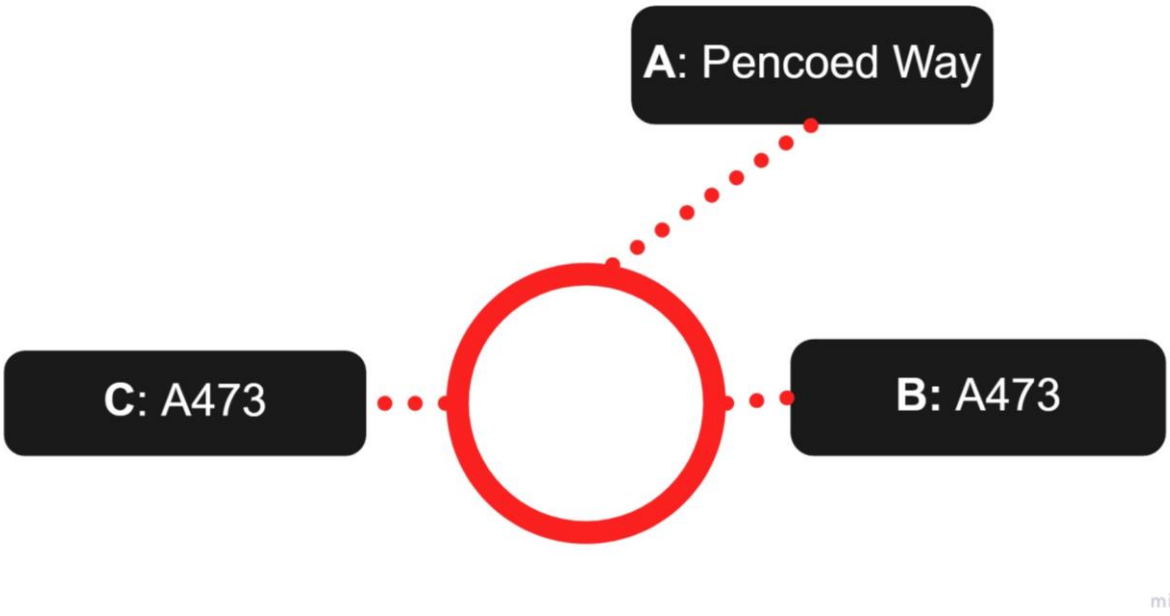


Table 6-24 - Junction 5: 2020 Base Year

	A	B	C	TOTAL
AM				
A				*424*
B				*1,962*
C				*1,775*
Total	*429*	*1,633*	*2,098*	*4,161*
PM				
A				*486*
B				*1,694*
C				*1,738*
Total	*393*	*1,674*	*1,851*	*3,918*

Table 6-25 provides a summary of the traffic flows for the 2033 Horizon Year scenario.

Table 6-25 - Junction 5: 2033 Horizon Year Traffic Flows

	A	B	C	TOTAL
AM				
A				*453*
B				*2,094*
C				*1,895*
Total	*458*	*1,743*	*2,239*	*4,441*
PM				
A				*519*
B				*1,808*
C				*1,855*
Total	*420*	*1,787*	*1,975*	*4,181*

Table 6-26 provides a summary of the traffic flows for the 2033 Horizon Year with Development scenario. These traffic flows include the 2033 Baseline Flows in addition to the proposed development traffic.

Table 6-26 - Junction 5: 2033 Horizon Year Traffic Flows with Development

	A	B	C	TOTAL
AM				
A				*461*
B				*2,149*
C				*1,908*
Total	*470*	*1,760*	*2,288*	*4,518*
PM				
A				*530*
B				*1,835*
C				*1,885*
Total	*429*	*1,824*	*1,997*	*4,250*

6.4.8 JUNCTION 6 - BRIDGEND COYCHURCH ROUNDABOUT

Table 6-27 provides a summary of the 2020 Baseline Flows for Junction. For information, the junction is presented as per Figure 6-6.

Figure 6-6 - Junction 6 - Arm Assignment

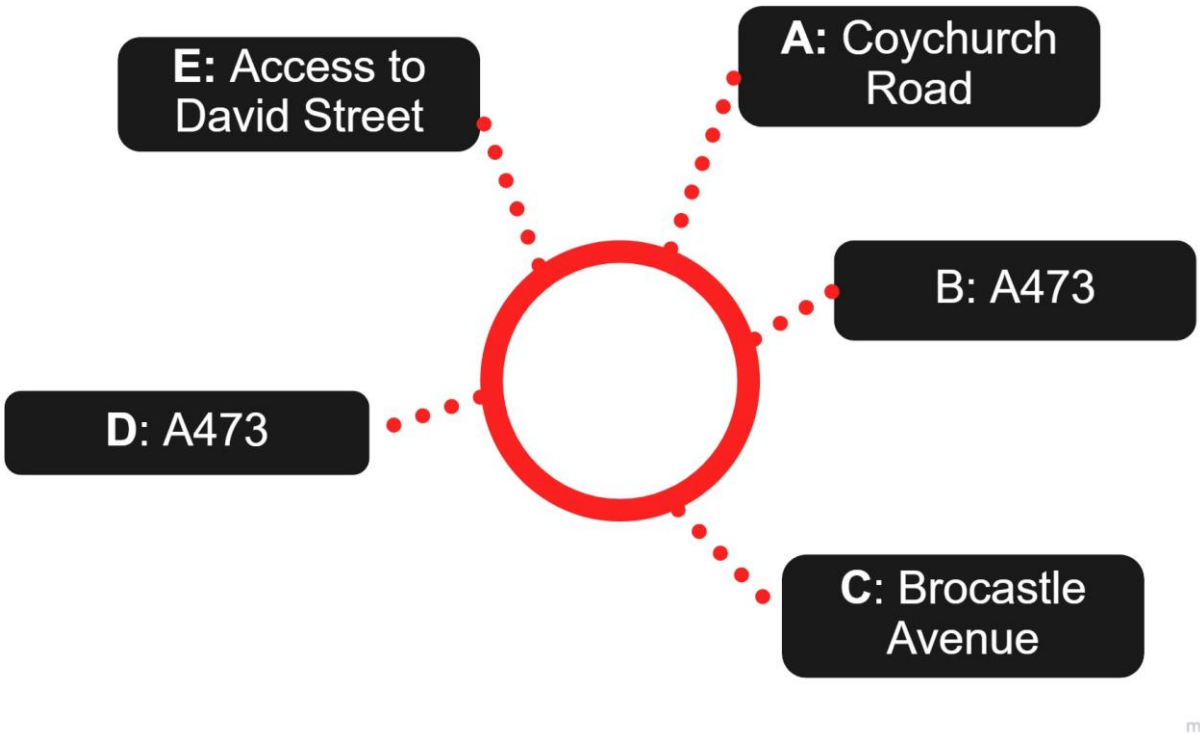


Table 6-27 - Junction 6: 2020 Base Year

	A	B	C	D	E	TOTAL
AM						
A	-	491	131	382	12	*1,017*
B	346	-	244	800	424	*1,814*
C	159	203	-	65	31	*458*
D	181	553	98	47	49	*927*
E	81	276	14	8	-	*378*
Total	*766*	*1,522*	*488*	*1,301*	*516*	*4,593*
PM						
A	-	354	103	290	5	*751*
B	380	-	172	767	178	*1,496*
C	265	289	-	117	14	*685*
D	269	512	86	55	23	*945*
E	156	395	31	3	-	*585*
Total	*1,070*	*1,550*	*391*	*1,231*	*221*	*4,463*

Table 6-28 provides a summary of the traffic flows for the 2033 Horizon Year scenario.

Table 6-28 - Junction 6: 2033 Horizon Year Traffic Flows

	A	B	C	D	E	TOTAL
AM						
A	-	524	140	408	12	*1,085*
B	369	-	261	853	452	*1,935*
C	169	216	-	69	33	*488*
D	193	590	104	50	53	*989*
E	86	294	15	8	-	*404*
Total	*817*	*1,625*	*520*	*1,389*	*551*	*4,902*
PM						
A	-	377	110	309	6	*802*
B	405	-	183	819	190	*1,597*
C	283	308	-	125	15	*731*
D	287	547	92	58	25	*1,009*
E	166	422	33	3	-	*624*
Total	*1,142*	*1,654*	*418*	*1,314*	*236*	*4,763*

Table 6-29 provides a summary of the traffic flows for the 2033 Horizon Year with Development scenario. These traffic flows include the 2033 Baseline Flows in addition to the proposed development traffic.

Table 6-29 - Junction 6: 2033 Horizon Year Traffic Flows with Development

	A	B	C	D	E	TOTAL
AM						
A	-	529	140	408	12	*1,089*
B	378	-	267	875	464	*1,984*
C	169	218	-	69	33	*490*
D	193	594	104	50	53	*994*
E	86	296	15	8	-	*406*
Total	*826*	*1,637*	*527*	*1,410*	*562*	*4,963*
PM						
A	-	384	110	309	6	*809*
B	411	-	186	830	193	*1,619*
C	283	314	-	125	15	*737*
D	287	557	92	58	25	*1,019*
E	166	430	33	3	-	*632*
Total	*1,147*	*1,684*	*420*	*1,325*	*238*	*4,815*

6.4.9 JUNCTION 7 - BRIDGEND WATERTON ROUNDABOUT

Table 6-30 provides a summary of the 2020 Baseline Flows for the Junction 7. For information, the junction is presented as per Figure 6-7.

Figure 6-7 - Junction 7 - Arm Assignment

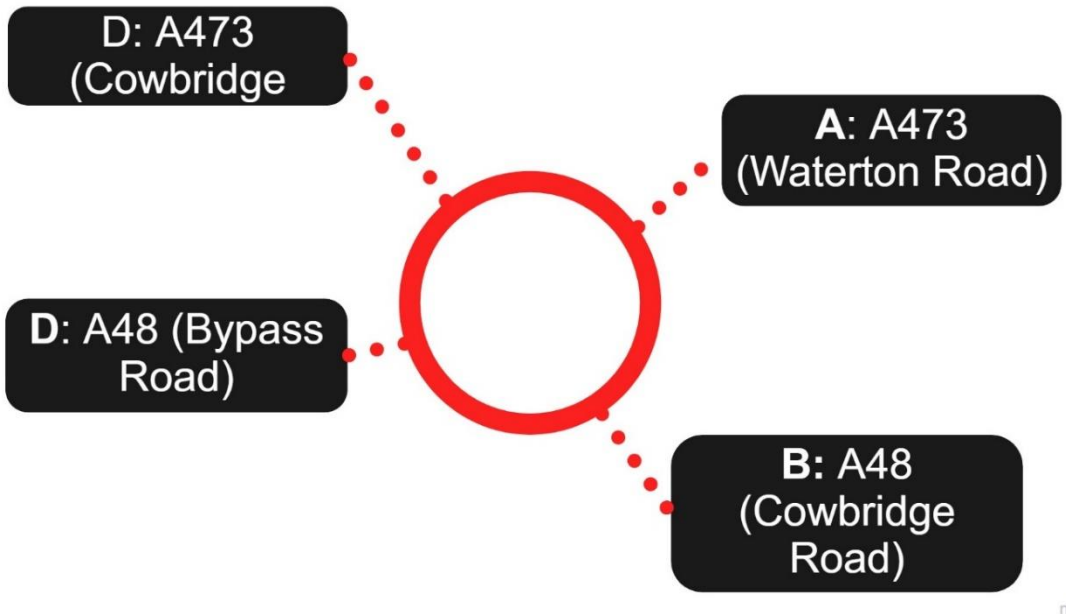


Table 6-30 - Junction 7: 2020 Base Year

	A	B	C	D	E	TOTAL
AM						
A	-	179	42	572	458	*1,251*
B	122	-	8	205	307	*642*
C	16	8	-	26	18	*68*
D	553	267	22	-	61	*902*
E	221	217	27	43	-	*508*
Total	*911*	*671*	*99*	*846*	*844*	*3,371*
PM						
A	-	90	31	759	269	*1,149*
B	66	-	9	260	242	*577*
C	31	4	-	73	49	*157*
D	456	142	31	-	51	*680*
E	367	215	77	43	-	*701*
Total	*920*	*450*	*148*	*1,135*	*611*	*3,264*

Table 6-31 provides a summary of the traffic flows for the 2033 Horizon Year scenario.

Table 6-31 - Junction 7: 2033 Horizon Year Traffic Flows

	A	B	C	D	E	TOTAL
AM						
A	-	191	44	610	488	*1,335*
B	130	-	8	219	327	*685*
C	17	8	-	28	19	*72*
D	590	284	24	-	65	*963*
E	236	232	29	46	-	*542*
Total	*973*	*716*	*105*	*903*	*900*	*3,597*
PM						
A	-	96	33	810	287	*1,226*
B	71	-	10	277	258	*616*
C	33	4	-	78	53	*168*
D	487	151	33	-	54	*726*
E	391	229	82	46	-	*748*
Total	*982*	*480*	*158*	*1,211*	*652*	*3,484*

Table 6-32 provides a summary of the traffic flows for the 2033 Horizon Year with Development scenario. These traffic flows include the 2033 Baseline Flows in addition to the proposed development traffic.

Table 6-32 - Junction 7: 2033 Horizon Year Traffic Flows with Development

	A	B	C	D	E	TOTAL
AM						
A	-	195	45	620	496	*1,356*
B	131	-	8	219	327	*686*
C	17	8	-	28	19	*72*
D	592	284	24	-	65	*966*
E	237	232	29	46	-	*544*
Total	*977*	*719*	*106*	*913*	*908*	*3,623*
PM						
A	-	97	34	818	290	*1,238*
B	71	-	10	277	258	*617*
C	34	4	-	78	53	*168*
D	492	151	33	-	54	*731*
E	395	229	82	46	-	*752*
Total	*992*	*481*	*158*	*1,219*	*655*	*3,505*

7 PERCENTAGE IMPACT ASSESSMENT

7.1 INTRODUCTION

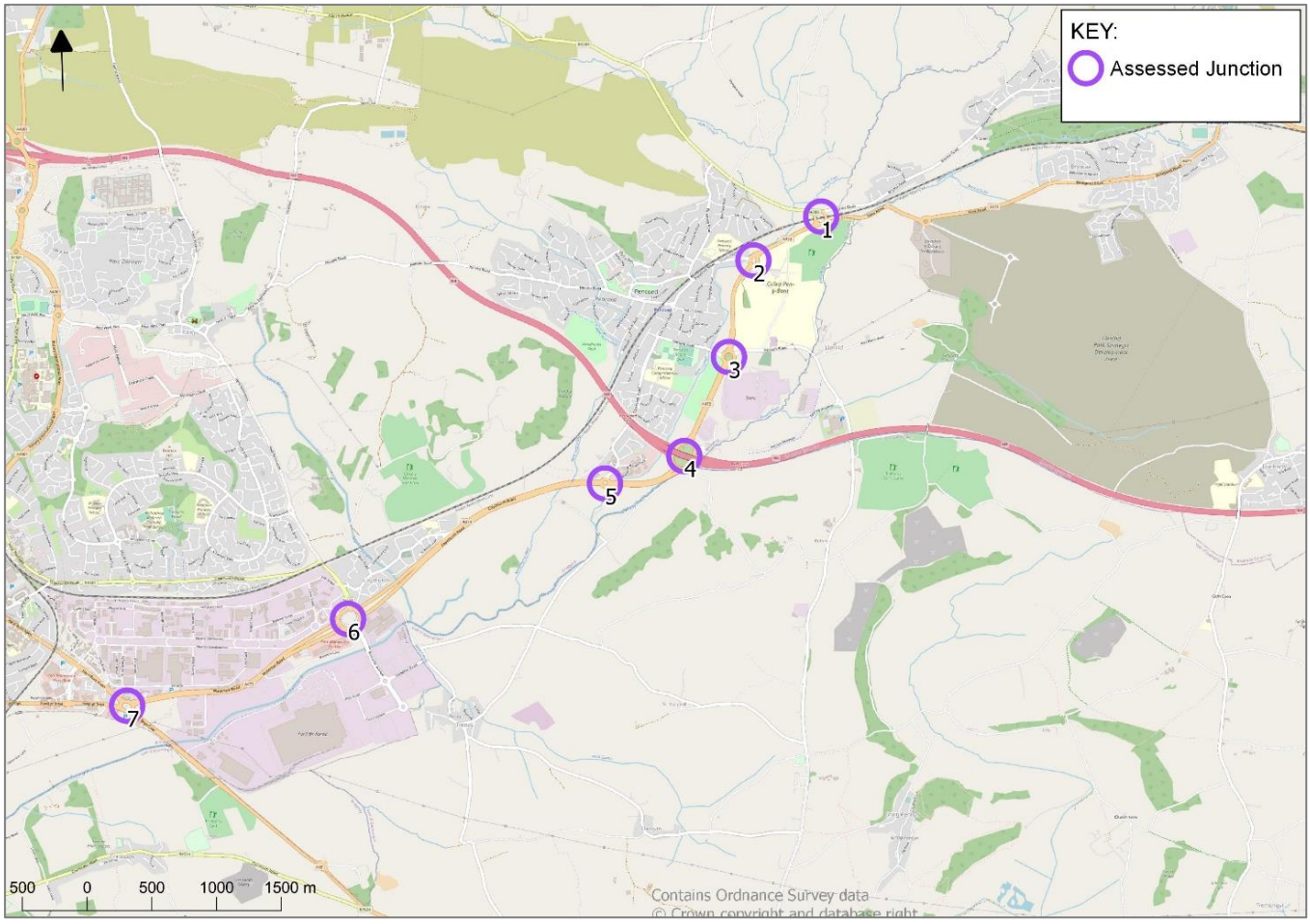
To establish an impact of the proposed development on the highway network in the vicinity of the Site, it has been agreed with BCBC to undertake a percentage impact assessment.

It has been agreed with BCBC that where the impact of the development traffic on any of the assessed junction arms results in an increase on the background traffic flows less than five percent, no further assessment will be required. However, where an increase of five percent or more is observed on any link in a junction, the junction would require junction modelling. Appendix G contains emails where the methodology was presented to BCBC and agreed.

7.2 PERCENTAGE IMPACT ASSESSMENT

Seven junctions in total have been assessed. The junctions are located along the A473 between Brynna Rd to the north and the Waterton area of Bridgend to the south. The junctions are consecutively referred to as Junction 1 to Junction 7 from the north to south. The location of these junctions is presented in Figure 7-1.

Figure 7-1 – Assessed Junctions Locations



For each junction, proposed development trips were compared to the 2033 Horizon Year flows to determine development's impact on each approach arm at each junction.

For maximum robustness, envisaged departures from, and arrivals to, the development were added to the assessment for each investigated time period. As the junctions were assessed using the JTC survey data, as well as the SEWTM output, the traffic distribution at each junction was established, and expressed as proportions for each turn for departures and arrivals at the junction alike.

The tables below present the results of the assessment exercise for the morning (AM), and evening (PM) peak periods, for the 2033 Horizon Year.

7.2.1 JUNCTION 1 – BRIDGEND B4280 / BRYNNA ROAD / A473 / PENYBOND ROAD ROUNDABOUT

Table 7-1 provides a summary of the distribution of development traffic at Junction 1. The flows in Table 7-1 were compared to the 2033 Horizon Year flows for Junction 1 presented in Table 6-13 and the percentage impact of the development traffic on Junction 1 is summarised in Table 7-2.

Table 7-1 – Junction 1: 2033 Development Trip Generation

	A	B	C	D	TOTAL
AM					
A	-	1	2	-	*3*
B	2	-	89	9	*100*
C	3	30	-	4	*36*
D	-	5	1	-	*6*
Total	*5*	*36*	*92*	*12*	*146*
PM					
A	-	1	1	-	*3*
B	1	-	30	8	*39*
C	14	106	-	12	*132*
D	-	9	2	-	*11*
Total	*15*	*117*	*33*	*20*	*185*

Table 7-2 - Junction 1: Percentage Impact

	A	B	C	D	TOTAL
AM					
A		5%	1%	0%	*1%*
B	11%		12%	11%	*12%*
C	3%	8%		3%	*6%*
D	0%	5%	1%		*2%*
Total	*3%*	*8%*	*7%*	*5%*	*7%*
PM					
A		11%	1%	0%	*2%*
B	7%		8%	7%	*8%*
C	6%	17%		6%	*13%*
D	0%	11%	1%		*4%*
Total	*5%*	*17%*	*5%*	*5%*	*9%*

As demonstrated in Table 7-2, the impact at this junction is equal to or above 5% on all of the junction arms and the overall junction flows. Therefore, this junction will be subject to further assessment and an Arcady junction model will be prepared.

7.2.2 JUNCTION 2 - BRIDGEND A473 / PENYBONT ROAD / PENCOED CAMPUS ROUNDABOUT

Table 7-3 provides a summary of the distribution of development traffic at Junction 1. The flows in Table 7-3 were compared to the 2033 Horizon Year flows for Junction 2 presented in Table 6-16 and the percentage impact of the development traffic on Junction 1 is summarised in Table 7-4.

Table 7-3 - Junction 2: 2033 Development Trip Generation

	A	B	C	D	TOTAL
AM					
A	-	5	84	10	*99*
B	1	-	1	-	*1*
C	31	9	-	3	*42*
D	4	-	1	-	*5*
Total	*36*	*14*	*85*	*13*	*148*
PM					
A	-	1	35	6	*42*
B	1	-	1	-	*2*
C	122	2	-	7	*131*
D	9	-	1	-	*10*
Total	*132*	*2*	*37*	*13*	*184*

Table 7-4 - Junction 2: Percentage Impact

	A	B	C	D	TOTAL
AM					
A		7%	8%	7%	*8%*
B	4%		1%	0%	*1%*
C	8%	4%		4%	*6%*
D	4%	0%	1%		*2%*
Total	*7%*	*5%*	*7%*	*6%*	*6%*
PM					
A		5%	7%	5%	*7%*
B	7%		2%	0%	*3%*
C	14%	7%		7%	*13%*
D	7%	0%	2%		*5%*
Total	*13%*	*6%*	*6%*	*6%*	*10%*

As demonstrated in Table 7-4, the impact at this junction is equal to or above 5% on two of the junction arms in the AM, three junction arms in the PM, as well as the overall junction flows. Therefore, this junction will be subject to further assessment and an Arcady junction model will be prepared.

7.2.3 JUNCTION 3 - BRIDGEND A473 / VELINDRE ROAD / PENCOED TECHNOLOGY PARK ROUNDABOUT

Table 7-5 provides a summary of the distribution of development traffic at Junction 1. The flows in Table 7-5 were compared to the 2033 Horizon Year flows for Junction 2 presented in Table 6-19 and the percentage impact of the development traffic on Junction 1 is summarised in Table 7-6.

Table 7-5 - Junction 3: 2033 Development Trip Generation

	A	B	C	D	E	TOTAL
AM						
A	-	17	3	62	4	*85*
B	16	-	2	46	8	*72*
C	-	0	-	-	-	*0*
D	12	22	-	-	-	*34*
E	1	4	-	-	-	*4*
Total	*28*	*43*	*5*	*107*	*11*	*195*
PM						
A	-	13	0	22	1	*37*
B	20	-	0	27	5	*52*
C	2	6	-	-	-	*8*
D	46	33	-	-	-	*80*
E	4	7	-	-	-	*11*
Total	*71*	*59*	*0*	*49*	*6*	*187*

Table 7-6 - Junction 3: Percentage Impact

	A	B	C	D	E	TOTAL
AM						
A		12%	6%	6%	6%	*7%*
B	19%		16%	16%	16%	*17%*
C		6%		0%	0%	*1%*
D	2%	6%	0%		0%	*3%*
E	2%	6%	0%	0%		*1%*
Total	*4%*	*8%*	*2%*	*7%*	*5%*	*6%*
PM						
A		19%	4%	4%	4%	*6%*
B	16%		10%	10%	10%	*11%*
C		15%		0%	0%	*3%*
D	6%	15%	0%		0%	*6%*
E	6%	15%	0%	0%		*5%*
Total	*7%*	*16%*	*1%*	*5%*	*2%*	*7%*

As demonstrated in Table 7-6, the impact at this junction is equal to or above 5% on two of the junction arms in the AM, four junction arms in the PM, as well as the overall junction flows. Therefore, this junction will be subject to further assessment and an Arcady junction model will be prepared.

7.2.4 JUNCTION 4 - BRIDGEND M4 J35 ROUNDABOUT (INCLUDING MOTORWAY ON-SLIPS AND OFF-SLIPS) (PARTIALLY SIGNALISED)

Table 7-7 provides a summary of the distribution of development traffic at Junction 1. The flows in Table 7-7 were compared to the 2033 Horizon Year flows for Junction 2 presented in Table 6-22 and the percentage impact of the development traffic on Junction 1 is summarised in Table 7-8.

Table 7-7 - Junction 4: 2033 Development Trip Generation

	A	B	C	D	TOTAL
AM					
A	-	43	55	9	*107*
B	15	-	-	-	*15*
C	15	-	-	-	*15*
D	4	-	-	-	*4*
Total	*34*	*43*	*55*	*9*	*141*
PM					
A	-	20	25	5	*49*
B	38	-	-	-	*38*
C	36	-	-	-	*36*
D	6	-	-	-	*6*
Total	*80*	*20*	*25*	*5*	*129*

Table 7-8 - Junction 4: Percentage Impact

	A	B	C	D	TOTAL
AM					
A					*11%*
B					*1%*
C					*1%*
D					*1%*
Total	*4%*	*3%*	*3%*	*3%*	*3%*
PM					
A					*8%*
B					*2%*
C					*2%*
D					*2%*
Total	*8%*	*1%*	*1%*	*1%*	*3%*

As demonstrated in Table 7-8, the impact at this junction is above 5% on one junction arm in the both the AM and PM. Therefore, this junction will be subject to further assessment and a LinSig junction model will be prepared.

7.2.5 JUNCTION 5 - BRIDGEND BOCAM PARK ROUNDABOUT

Table 7-9 provides a summary of the distribution of development traffic at Junction 1. The flows in Table 7-9 were compared to the 2033 Horizon Year flows for Junction 2 presented in Table 6-25 and the percentage impact of the development traffic on Junction 1 is summarised in Table 7-10.

Table 7-9 - Junction 5: 2033 Development Trip Generation

	A	B	C	TOTAL
AM				
A	-	5	3	*9*
B	10	-	45	*56*
C	1	12	-	*13*
Total	*11*	*17*	*49*	*77*
PM				
A	-	9	2	*11*
B	7	-	20	*27*
C	3	28	-	*31*
Total	*10*	*37*	*22*	*69*

Table 7-10 - Junction 5: Percentage Impact

	A	B	C	TOTAL
AM				
A				*2%*
B				*3%*
C				*1%*
Total	*2%*	*1%*	*2%*	*2%*
PM				
A				*2%*
B				*2%*
C				*2%*
Total	*2%*	*2%*	*1%*	*2%*

As demonstrated in Table 7-10, the impact at this junction does not exceed 5% at any of the junction arms or the overall junction flows. Therefore, this junction will not require further modelling assessment.

7.2.6 JUNCTION 6 - BRIDGEND COYCHURCH ROUNDABOUT

Table 7-11 provides a summary of the distribution of development traffic at Junction 1. The flows in Table 7-11 were compared to the 2033 Horizon Year flows for Junction 2 presented in Table 6-28 and the percentage impact of the development traffic on Junction 1 is summarised in Table 7-12.

Table 7-11 - Junction 6: 2033 Development Trip Generation

	A	B	C	D	E	TOTAL
AM						
A	-	4	-	-	-	*4*
B	9	-	7	21	11	*49*
C	-	2	-	-	-	*2*
D	-	5	-	-	-	*5*
E	-	2	-	-	-	*2*
Total	*9*	*13*	*7*	*21*	*11*	*61*
PM						
A	-	7	-	-	-	*7*
B	6	-	3	11	3	*22*
C	-	6	-	-	-	*6*
D	-	10	-	-	-	*10*
E	-	8	-	-	-	*8*
Total	*6*	*31*	*3*	*11*	*3*	*53*

Table 7-12 - Junction 6: Percentage Impact

	A	B	C	D	E	TOTAL
AM						
A		1%	0%	0%	0%	*0%*
B	3%		3%	3%	3%	*3%*
C		1%		0%	0%	*0%*
D	0%	1%	0%		0%	*0%*
E	0%	1%	0%	0%		*1%*
Total	*1%*	*1%*	*1%*	*2%*	*2%*	*1%*
PM						
A		2%	0%	0%	0%	*1%*
B	1%		1%	1%	1%	*1%*
C		2%		0%	0%	*1%*
D	0%	2%	0%		0%	*1%*
E	0%	2%	0%	0%		*1%*
Total	*0%*	*2%*	*1%*	*1%*	*1%*	*1%*

As demonstrated in Table 7-12, the impact at this junction does not exceed 5% at any of the junction arms or the overall junction flows. Therefore, this junction will not require further modelling assessment.

7.2.7 JUNCTION 7 - BRIDGEND WATERTON ROUNDABOUT

Table 7-13 provides a summary of the distribution of development traffic at Junction 1. The flows in Table 7-13 were compared to the 2033 Horizon Year flows for Junction 2 presented in Table 6-31 and the percentage impact of the development traffic on Junction 1 is summarised in Table 7-14.

Table 7-13 - Junction 7: 2033 Development Trip Generation

	A	B	C	D	E	TOTAL
AM						
A	-	3	1	10	8	*21*
B	1	-	-	-	-	*1*
C	0	-	-	-	-	*0*
D	3	-	-	-	-	*3*
E	1	-	-	-	-	*1*
Total	*5*	*3*	*1*	*10*	*8*	*26*
PM						
A	-	1	0	7	3	*11*
B	1	-	-	-	-	*1*
C	0	-	-	-	-	*0*
D	5	-	-	-	-	*5*
E	4	-	-	-	-	*4*
Total	*10*	*1*	*0*	*7*	*3*	*21*

Table 7-14 - Junction 7: Percentage Impact

	A	B	C	D	E	TOTAL
AM						
A		2%	2%	2%	2%	*2%*
B	0%		0%	0%	0%	*0%*
C		0%		0%	0%	*0%*
D	0%	0%	0%		0%	*0%*
E	0%	0%	0%	0%		*0%*
Total	*0%*	*0%*	*1%*	*1%*	*1%*	*1%*
PM						
A		1%	1%	1%	1%	*1%*
B	1%		0%	0%	0%	*0%*
C		0%		0%	0%	*0%*
D	1%	0%	0%		0%	*1%*
E	1%	0%	0%	0%		*1%*
Total	*1%*	*0%*	*0%*	*1%*	*0%*	*1%*

As demonstrated in Table 7-14, the impact at this junction does not exceed 5% at any of the junction arms or the overall junction flows. Therefore, this junction will not require further modelling assessment.

8 OPERATIONAL ASSESSMENT

8.1 OVERVIEW

This chapter will summarise the capacity assessments undertaken along with commentary on the junction modelling and how junctions are expected to perform as a result of future and proposed development induced traffic growth.

8.2 METHODOLOGY

8.2.1 SITE ACCESS JUNCTION

Site Access junctions were modelled using Junctions 9 modelling software and are PICADY assessments.

Proposed access points to the development are illustrated in Section 4 and were taken from a feasibility report produced by Opus in 2018. The proposed accesses are:

- Northern access – Priority junction with A473 which includes right turn lane from the A473 into the site; and,
- Southern access – Priority junction with Felindre Road.

The site access junctions were modelled for the 2031 and 2033 Horizon Year with Development scenarios as the junctions would be new and as such would not be implemented without the proposed development.

8.2.2 NETWORK JUNCTIONS

As previously stated in Section 7, network junctions which experienced a net impact of 5% or more on any junction arm would be modelled in the appropriate junction modelling software. Junctions 1 - 4 – as per Section 7 – were determined to require junction modelling, while junctions 5 – 7 did not.

It was requested by BCBC that committed development would be considered while modelling the junctions. The committed development Parc Llanilid, Llanilid was therefore considered. WSP set out a series of assumptions for consideration of the impact of the committed development traffic in an email dated 4 March 2021. These assumptions were agreed by the BCBC as the highway authority and these emails are contained in Appendix G.

8.3 OPERATIONAL ASSESSMENT

8.3.1 NORTHERN ACCESS

This section will provide a summary of the operational capacity of the proposed site access junction onto the A473. Table 8-1 provides a summary of the operational capacity results from the Junctions 9 model for the access. The full and detailed output can be seen in Appendix F.

Table 8-1 – Northern Access: 2031 Horizon Year with Development Capacity Results – A473

	AM			PM		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
Site Access to A473 West	0.3	11.14	0.19	0.1	9.08	0.09
Site Access to A473 East	0.6	19.36	0.34	0.2	16.41	0.13
A473 West to A473 East and Site Access	0.1	8.37	0.07	0.2	9.91	0.17

The modelling results presented in the table above demonstrate that the proposed access would operate well within capacity with a maximum Ratio of Flow to Capacity (RFC) observed in the AM peak hour on the Site Access arm. The RFC is 0.34 with an associated queue of 0.6 PCUs and delay of 19.36 seconds.

Table 8-2 – Northern Access: 2033 Horizon Year with Development Capacity Results – A473

	AM			PM		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
Site Access to A473 West	0.3	11.18	0.19	0.1	9.11	0.09
Site Access to A473 East	0.6	19.52	0.34	0.2	16.52	0.14
A473 West to A473 East and Site Access	0.1	8.38	0.07	0.2	9.94	0.17

The modelling results presented in the table above demonstrate that the proposed access would operate well within capacity with a maximum Ratio of Flow to Capacity (RFC) observed in the AM peak hour on the Site Access arm. The RFC is 0.34 with an associated queue of 0.6 PCUs and delay of 19.52 seconds.

8.3.2 SOUTHERN ACCESS

This section will provide a summary of the operational capacity of the proposed site access junction onto the A473 from the site. Table 8-3 below summarises the modelled junction performance of the Southern access option using Junctions 9. The full and detailed output can be seen in Appendix F.

Table 8-3 – Southern Access: 2031 Horizon Year with Development Capacity Results – Felindre Road

	AM			PM		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
Site Access to Felindre Road	0.8	15.81	0.43	0.3	12.03	0.19
Felindre Road West to Site Access and Felindre Road East	0.1	5.77	0.07	1,0	6.11	0.31

The modelling results presented in the table above demonstrate that the proposed access would operate well within capacity with a maximum Ratio of Flow to Capacity (RFC) observed in the AM

peak hour on the Site Access arm. The RFC is 0.43 with an associated queue of 0.8 PCUs and delay of 15.81 seconds.

Table 8-4 – Southern Access: 2033 Horizon Year with Development Capacity Results – Felindre Road

	AM			PM		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
Site Access to Felindre Road	0.8	15.94	0.43	0.3	12.10	0.19
Felindre Road West to Site Access and Felindre Road East	0.1	5.77	0.08	1.0	6.10	0.31

The modelling results presented in the table above demonstrate that the proposed access would operate well within capacity with a maximum Ratio of Flow to Capacity (RFC) observed in the AM peak hour on the Site Access arm. The RFC is 0.43 with an associated queue of 0.8 PCUs and delay of 15.94 seconds.

8.3.3 JUNCTION 1 - BRIDGEND B4280 / BRYNNA ROAD / A473 / PENYBONT ROAD ROUNDABOUT

This section will provide a summary of the operational capacity of Junction 1. The following tables provide a summary of the operational capacity results from the Junctions 9 model for the access. The full and detailed output can be seen in Appendix F.

Table 8-5 – Junction 1: 2020 Base Year Capacity Results

	AM			PM		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
A – Bryanna Road	0.4	3.77	0.28	0.2	3.31	0.14
B – New Road	1.6	6.61	0.62	0.5	3.53	0.34
C – Penybont Road	0.5	2.86	0.32	1.4	4.68	0.58
D – B4280	0.3	2.89	0.22	0.2	3.10	0.19

The modelling results presented in the table above demonstrate that Junction 1 would operate within capacity with a maximum Ratio of Flow to Capacity (RFC) observed in the AM peak hour New Road (Arm B). The RFC is 0.62 with an associated queue of 1.6 PCUs and delay of 6.61 seconds.

Table 8-6 - Junction 1: 2033 Horizon Year Capacity Results

	AM			PM		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
A – Bryanna Road	0.4	3.95	0.30	0.2	3.42	0.15
B – New Road	2.0	7.69	0.67	0.6	3.68	0.37
C – Penybont Road	0.5	2.96	0.34	1.6	5.21	0.62
D – B4280	0.3	2.98	0.24	0.3	3.22	0.20

The modelling results presented in the table above demonstrate that Junction 1 would operate within capacity with a maximum Ratio of Flow to Capacity (RFC) observed in the AM peak hour on New Road (Arm B). The RFC is 0.67 with an associated queue of 2.0 PCUs and delay of 7.69 seconds.

Table 8-7 - Junction 1: 2033 Horizon Year with Development Capacity Results

	AM			PM		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
A – Bryanna Road	0.4	4.04	0.31	0.2	3.62	0.16
B – New Road	2.9	10.11	0.75	0.6	3.86	0.39
C – Penybont Road	0.6	3.07	0.36	2.3	6.64	0.70
D – B4280	0.3	3.04	0.25	0.3	3.44	0.22

The modelling results presented in the previous table demonstrate that Junction 1 would operate within capacity with a maximum Ratio of Flow to Capacity (RFC) observed in the AM peak hour on New Road (Arm B). The RFC is 0.75 with an associated queue of 2.9 PCUs and delay of 10.11 seconds.

Table 8-8 – Junction 1: 2033 Horizon Year with Committed Development

	AM			PM		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
A – Bryanna Road	0.4	4.13	0.31	0.2	3.94	0.17
B – New Road	8.9	26.43	0.91	0.9	4.35	0.46
C – Penybont Road	0.6	3.19	0.39	3.9	9.87	0.80
D – B4280	0.3	3.08	0.25	0.3	3.71	0.23

The modelling results presented in the table above demonstrate that Junction 1 would operate slightly above desirable operational capacity thresholds in the AM peak only, with a maximum Ratio of Flow to Capacity (RFC) observed in the AM peak hour on New Road (Arm B). The RFC is 0.91, with an associated queue of 8.9 PCUs and delay of 26.43 seconds.

Table 8-9 – Junction 1: 2033 Horizon Year with Committed Development and Development

	AM			PM		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
A – Bryanna Road	0.5	4.22	0.32	0.2	4.20	0.18
B – New Road	23.2	60.75	0.99	1.0	4.60	0.49
C – Penybont Road	0.7	3.32	0.41	7.0	16.44	0.88
D – B4280	0.3	3.15	0.26	0.3	4.01	0.25

The modelling results presented in the table above demonstrate that Junction 1 would operate above desirable operational capacity thresholds in the AM peak with a maximum Ratio of Flow to

Capacity (RFC) observed in the AM peak hour on New Road (Arm B). The RFC is 0.99, with an associated queue of 23.2 PCUs and delay of 60.75 seconds.

Summary

It is evident that the committed development traffic would impact on the operation of Junction 1 to a greater degree than the proposed development on its own. Without committed development, the junction would continue to operate within capacity; however, the committed development results in the desirable operational capacity threshold of 0.85 RFC being exceeded in the AM peak on New Road junction arm. On the basis of the above junction assessment it is the view of this TA that the development would not have a severe impact on this junction.

8.3.4 JUNCTION 2 - BRIDGEND A473 / PENYBONT ROAD / PENCOED CAMPUS ROUNDABOUT

This section will provide a summary of the operational capacity of Junction 2. The following tables provide a summary of the operational capacity results from the Junctions 9 model for the access. The full and detailed output can be seen in Appendix F.

Table 8-10 - Junction 2: 2020 Base Year Capacity Results

	AM			PM		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
A – Penybont Road (NE)	1.9	5.13	0.65	0.4	2.36	0.30
B – Bridgend College Access	0.1	4.75	0.12	0.1	3.29	0.05
C – A473	0.4	2.30	0.31	0.8	2.91	0.46
D – Penybont Road (W)	0.2	3.23	0.19	0.2	3.44	0.16

The modelling results presented in the table above demonstrate that Junction 2 would operate within capacity with a maximum Ratio of Flow to Capacity (RFC) observed in the AM peak hour on Penybont Road (NE) (Arm A). The RFC is 0.65 with an associated queue of 1.9 PCUs and delay of 5.13 seconds.

Table 8-11 - Junction 2: 2033 Horizon Year Capacity Results

	AM			PM		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
A – Penybont Road (NE)	2.3	5.99	0.70	0.5	2.43	0.32
B – Bridgend College Access	0.2	5.06	0.14	0.1	3.36	0.05
C – A473	0.5	2.38	0.33	1.0	3.09	0.49
D – Penybont Road (W)	0.3	3.34	0.21	0.2	3.59	0.18

The modelling results presented in the table above demonstrate that Junction 2 would operate within capacity with a maximum Ratio of Flow to Capacity (RFC) observed in the AM peak hour on Penybont Road (NE) (Arm A). The RFC is 0.70 with an associated queue of 2.3 PCUs and delay of 5.99 seconds.

Table 8-12 - Junction 2: 2033 Horizon Year with Development Capacity Results

	AM			PM		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
A – Penybont Road (NE)	3.1	7.45	0.76	0.5	2.51	0.34
B – Bridgend College Access	0.2	5.42	0.15	0.1	3.43	0.05
C – A473	0.5	2.47	0.35	1.3	3.55	0.55
D – Penybont Road (W)	0.3	3.42	0.21	0.2	3.87	0.20

The modelling results presented in the table above demonstrate that Junction 2 would operate within capacity with a maximum Ratio of Flow to Capacity (RFC) observed in the AM peak hour on Penybont Road (NE) (Arm A). The RFC is 0.76 with an associated queue of 3.1 PCUs and delay of 7.45 seconds.

Table 8-13 - Junction 2: 2033 Horizon Year with Committed Development

	AM			PM		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
A – Penybont Road (NE)	6.7	14.42	0.88	0.6	2.71	0.39
B – Bridgend College Access	0.2	6.31	0.17	0.1	3.58	0.06
C – A473	0.6	2.65	0.39	2.8	6.18	0.74
D – Penybont Road (W)	0.3	3.59	0.23	0.4	5.00	0.26

The modelling results presented in the table above demonstrate that Junction 2 would operate slightly above desirable operational capacity thresholds with a maximum Ratio of Flow to Capacity (RFC) observed in the AM peak hour on Penybont Road (NE) (Arm A). The RFC is 0.88, with an associated queue of 6.7 PCUs and delay of 14.42 seconds. This is not considered to be severe.

Table 8-14 - Junction 2: 2033 Horizon Year with Committed Development and Development

	AM			PM		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
A – Penybont Road (NE)	12.0	24.78	0.93	0.7	2.81	0.41
B – Bridgend College Access	0.2	6.86	0.18	0.1	3.66	0.06
C – A473	0.7	2.76	0.41	4.1	8.26	0.81
D – Penybont Road (W)	0.3	3.69	0.24	0.4	5.56	0.29

The modelling results presented in the table above demonstrate that Junction 2 would operate slightly above desirable operational capacity thresholds with a maximum Ratio of Flow to Capacity (RFC) observed in the AM peak hour on Penybont Road (NE) (Arm A). The RFC is 0.93, with an associated queue of 12.0 PCUs and delay of 24.78 seconds. This is not considered to be severe.

Summary

It is evident that the committed development traffic would impact on the operation of Junction 2 to a greater degree than the proposed development on its own. Without committed development, the junction would continue to operate within capacity; however, the addition of the committed development results in the desirable operational capacity threshold of 0.85 RFC being marginally exceeded in the AM peak on Penybont Road (NE) junction arm. On the basis of the above junction assessment, it is the view of this TA that the development would not have a severe impact on this junction.

8.3.5 JUNCTION 3 - BRIDGEND A473 / VELINDRE ROAD / PENCOED TECHNOLOGY PARK ROUNDABOUT

This section will provide a summary of the operational capacity Junction 3. The following tables provide a summary of the operational capacity results from the Junctions 9 model for the access. The full and detailed output can be seen in Appendix F.

Table 8-15 - Junction 3: 2020 Base Year Capacity Results

	AM			PM		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
A – A473 (N)	0.7	2.06	0.42	0.2	1.36	0.19
B – Velindre Road (E)	0.5	3.95	0.32	0.4	2.81	0.27
C – Pencoed Technology Park	0.0	2.84	0.03	0.2	2.63	0.15
D – A473 (S)	0.8	2.44	0.44	1.0	2.82	0.50
E – Velindre Road (W)	0.5	4.79	0.33	0.3	4.42	0.23

The modelling results presented in the table above demonstrate that Junction 3 would operate within capacity with a maximum Ratio of Flow to Capacity (RFC) observed in the PM peak hour on the A473 (S) (Arm D). The RFC is 0.50 with an associated queue of 1.0 PCUs and delay of 2.82 seconds.

Table 8-16 - Junction 3: 2033 Horizon Year Capacity Results

	AM			PM		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
A – A473 (N)	0.8	2.22	0.46	0.3	1.39	0.20
B – Velindre Road (E)	0.6	4.34	0.36	0.4	2.93	0.29
C – Pencoed Technology Park	0.0	2.99	0.03	0.2	2.75	0.16
D – A473 (S)	0.9	2.59	0.47	1.2	3.06	0.54
E – Velindre Road (W)	0.6	5.19	0.36	0.3	4.72	0.26

The modelling results presented in the table above demonstrate that Junction 3 would operate within capacity with a maximum Ratio of Flow to Capacity (RFC) observed in the PM peak hour on the A473 (S) (Arm D). The RFC is 0.54 with an associated queue of 1.2 PCUs and delay of 3.06 seconds.

Table 8-17 - Junction 3: 2033 Horizon Year with Development Capacity Results

	AM			PM		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
A – A473 (N)	1.0	2.39	0.49	0.3	1.44	0.22
B – Velindre Road (E)	0.8	5.06	0.43	0.5	3.11	0.33
C – Pencoed Technology Park	0.0	3.20	0.03	0.2	2.86	0.17
D – A473 (S)	0.9	2.71	0.49	1.4	3.39	0.58
E – Velindre Road (W)	0.6	5.41	0.37	0.4	5.13	0.28

The modelling results presented in the table above demonstrate that Junction 3 would operate within capacity with a maximum Ratio of Flow to Capacity (RFC) observed in the PM peak hour on the A473 (S) (Arm D). The RFC is 0.58 with an associated queue of 1.4 PCUs and delay of 3.39 seconds.

Table 8-18 - Junction 3: 2033 Horizon Year with Committed Development

	AM			PM		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
A – A473 (N)	1.2	2.69	0.55	0.3	1.46	0.24
B – Velindre Road (E)	0.7	5.19	0.41	0.5	3.16	0.32
C – Pencoed Technology Park	0.0	3.36	0.03	0.2	2.93	0.18
D – A473 (S)	1.0	2.73	0.49	1.7	3.91	0.63
E – Velindre Road (W)	0.6	5.43	0.37	0.4	5.70	0.31

The modelling results presented in the table above demonstrate that Junction 3 would operate within capacity with a maximum Ratio of Flow to Capacity (RFC) observed in the PM peak hour on the A473 (S) (Arm D). The RFC is 0.63 with an associated queue of 1.7 PCUs and delay of 3.91 seconds.

Table 8-19 - Junction 3: 2033 Horizon Year with Committed Development and Development

	AM			PM		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
A – A473 (N)	1.4	2.95	0.59	0.3	1.51	0.26
B – Velindre Road (E)	1.0	6.27	0.49	0.6	3.37	0.36
C – Pencoed Technology Park	0.0	3.62	0.04	0.2	3.06	0.019
D – A473 (S)	1.0	2.86	0.51	2.1	4.46	0.67
E – Velindre Road (W)	0.6	5.66	0.39	0.5	6.32	0.34

The modelling results presented in the table above demonstrate that Junction 3 would operate within capacity with a maximum Ratio of Flow to Capacity (RFC) observed in the PM peak hour on the A473 (S) (Arm D). The RFC is 0.67 with an associated queue of 2.1 PCUs and delay of 4.46 seconds.

Summary

It is evident that junction 3 would operate within operational capacity thresholds for all scenarios modelled. Therefore, it is the view of this TA that the proposed development would not have a severe impact on the operation of junction 3.

8.3.6 JUNCTION 4 - BRIDGEND M4 J35 ROUNDABOUT (INCLUDING MOTORWAY ON-SLIPS AND OFF-SLIPS) (PARTIALLY SIGNALISED)

Junction 4 (Bridgend M4 J35) has been modelled using LinSig software. The operational capacity of the junction will be measured by observing the Practical Reserve Capacity (PRC) of the junction, the Degree of Saturation (DoS) of each lane and the mean max queue and average delay on each lane.

The PRC is a calculation of the maximum degree of saturation on a Link controlled by the Stage Stream and demonstrates how much additional traffic could pass through a junction controlled by the Stage Stream all the while maintaining a maximum degree of saturation of 90% on all Links.

Degree of Saturation is the ratio of flow to the capacity of the link

WSP has applied optimisation to the signal timings of the model, optimising the junction as closely as possible to the junctions existing operation. This approach was agreed with BCBC due to the current circumstances. It is noted that the operational capacity of the junction is not highlighting any issues; however, it is acknowledged that the A473 N arm of the junction experiences queuing in the AM peak in particular. The modelling herein will demonstrate the relative impact of the development on the junction's operation.

Table 8-20 includes a summary of the results of the Base Year 2020, whilst the full detailed LinSig report is attached at Appendix F.

The signal timing and phasing used for the modelling for the AM Peak are shown in Figure 8-1 below, while the PM Peak is in Figure 8-2. Further details are provided within the LinSig report in Appendix F.

Figure 8-1 - 2020 AM Peak Signal Timing and Phasing

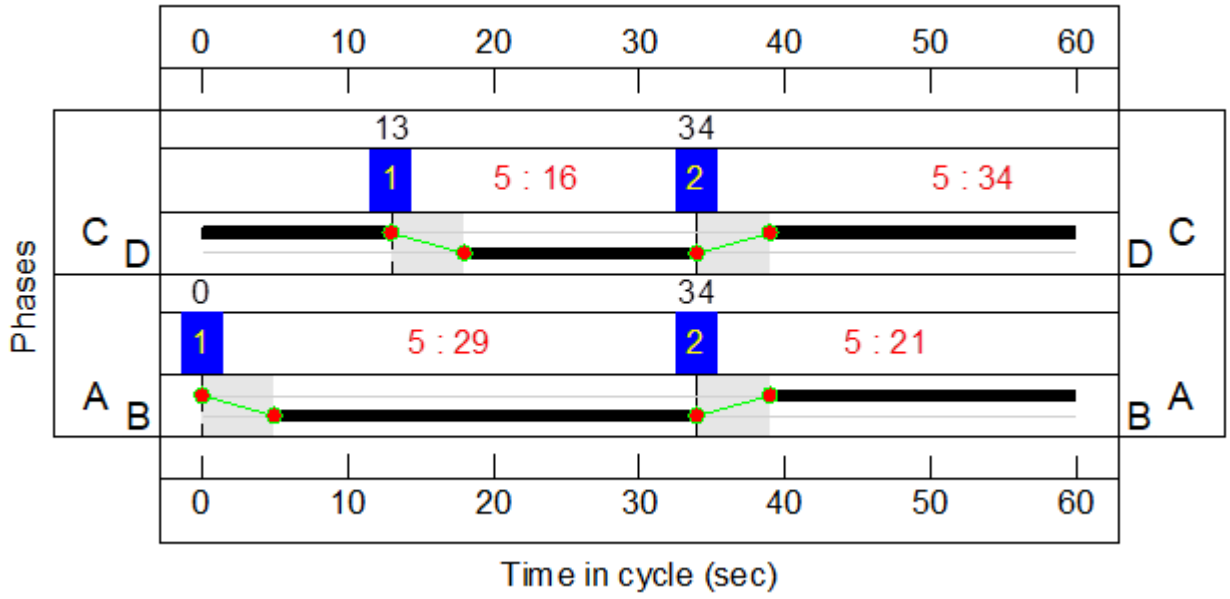


Figure 8-2 – 2020 PM Peak Signal Timing and Phasing

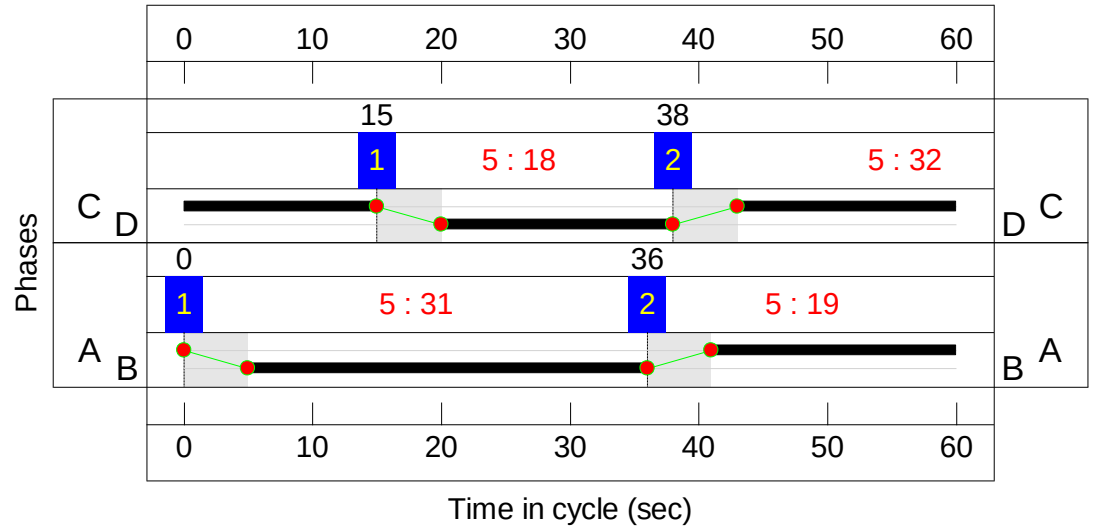


Table 8-20 – Junction 4: 2020 Base Year Capacity Results

Lane	AM Peak Period			PM Peak Period		
	Degree of Saturation (%)	Mean Max Queue (pcus)	Average Delay (s/pcu)	Degree of Saturation (%)	Mean Max Queue (pcus)	Average Delay (s/pcu)
A473 N Ahead Left	59.7%	6.4	21.7	45.3%	4.3	20.8
A473 N Ahead	68.1 : 68.1%	8.4	21.9	49.2 : 49.2%	5.0	20.0
M4 East Left	0.0%	0.0	0.0	0.0%	0.0	0.0
M4 East Ahead	58.2 : 58.2%	2.3	4.4	61.8 : 61.8%	1.9	4.3
A473 S Ahead Left	51.0%	6.3	10.5	60.4%	8.2	13.2
A473 S Ahead	70.9%	11.6	13.8	76.3%	13.1	16.8
M4 West Ahead Left	46.4%	0.4	5.4	32.5%	0.2	4.7
M4 West Ahead	56.0%	2.4	12.4	36.8%	1.2	10.3
Gyratory N Right Ahead	64.2%	7.0	10.5	52.4%	3.4	6.5
Gyratory N Right	65.9%	7.0	10.7	55.0%	3.8	6.6
Gyratory S Ahead	41.7%	3.8	21.4	34.6%	3.2	18.8
Gyratory S Right Ahead	68.8%	7.3	28.3	74.4%	8.9	28.4

The results of the Base Year 2020 scenario modelling at Junction 4 confirms that the junction would operate within capacity with a PRC of 27% across all lanes in the AM peak and 18% in the PM peak. The DoS, Mean Max Queues (MMQ) and delay on all links are within capacity.

Table 8-21 provides a summary of the results of the Horizon Year 2033, whilst the full detailed LinSig report is attached at Appendix F.

The AM Peak signal timing and phasing are shown in Figure 8-3 and the PM peak signal timing and phasing are shown in Figure 8-4.

Figure 8-3 - 2033 AM Peak Signal Timing and Phasing (Base)

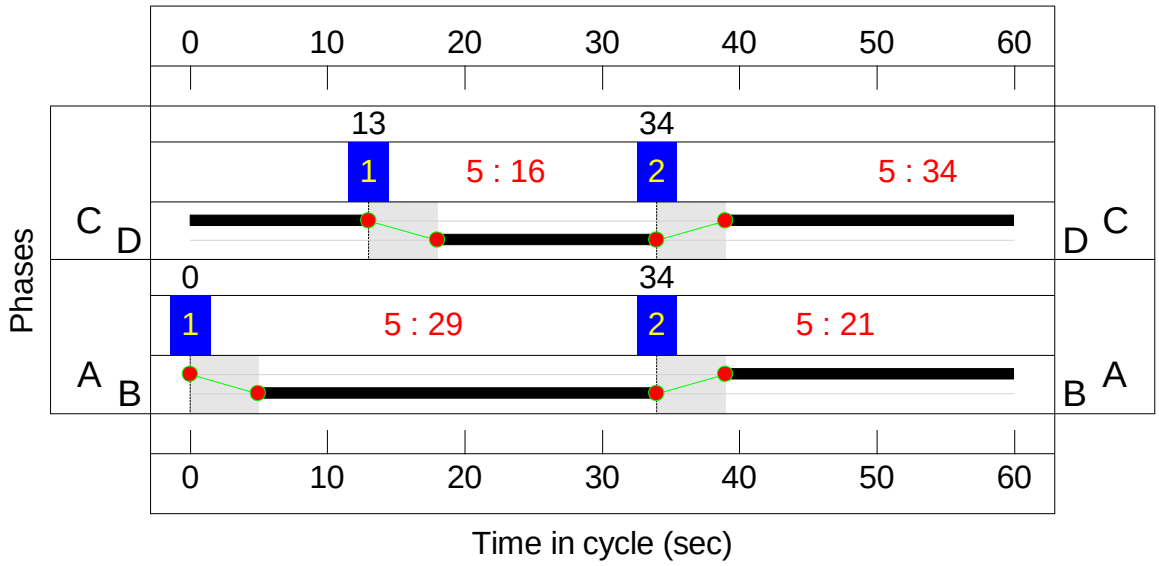


Figure 8-4 - 2033 PM Peak Signal Timing and Phasing (Base)

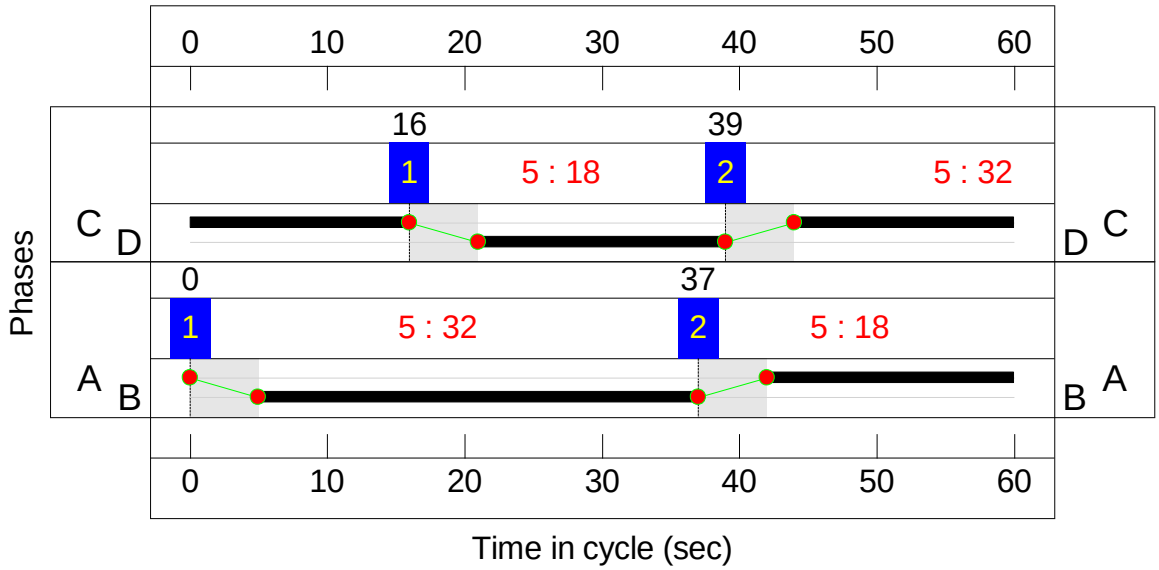


Table 8-21 - Junction 4: 2033 Horizon Year

Lane	AM Peak Period			PM Peak Period		
	Degree of Saturation (%)	Mean Max Queue (pcus)	Average Delay (s/pcu)	Degree of Saturation (%)	Mean Max Queue (pcus)	Average Delay (s/pcu)
A473 N Ahead Left	63.7%	7.0	22.6	51.0%	4.7	22.7
A473 N Ahead	72.8 : 72.8%	9.3	23.3	55.2 : 55.2%	5.6	21.9
M4 East Left	0.0%	0.0	0.0	0.0%	0.0	0.0
M4 East Ahead	63.9 : 63.9%	3.3	5.4	66.9 : 66.9%	3.0	5.1
A473 S Ahead Left	54.4%	7.0	11.0	64.3%	9.0	13.9
A473 S Ahead	75.7%	13.2	15.1	81.3%	15.0	19.0
M4 West Ahead Left	52.0%	0.9	6.4	36.8%	0.3	5.3
M4 West Ahead	65.2%	3.3	17.4	43.7%	1.6	13.4
Gyratory N Right Ahead	69.1%	9.0	11.6	54.4%	3.0	6.3
Gyratory N Right	69.8%	8.5	11.8	56.7%	3.7	6.6
Gyratory S Ahead	44.7%	4.0	21.1	37.0%	3.5	19.2
Gyratory S Right Ahead	73.5%	8.1	30.0	79.4%	10.0	31.0

The results of the Horizon Year 2033 scenario modelling at Junction 4 confirms that the junction would operate within capacity with a PRC of 19% across all lanes in the AM peak and 10.7% in the PM peak. The DoS, Mean Max Queues (MMQ) and delay on all links are within capacity.

Table 8-22 provides a summary of the results of the Horizon Year 2033 with Development, whilst the full detailed LinSig report is attached at Appendix F. The AM Peak signal timing and phasing are shown in Figure 8-5, while the PM Peak signal timing and phasing are shown in Figure 8-6.

Figure 8-5 - AM Peak Signal Timing and Phasing (Base + Dev)

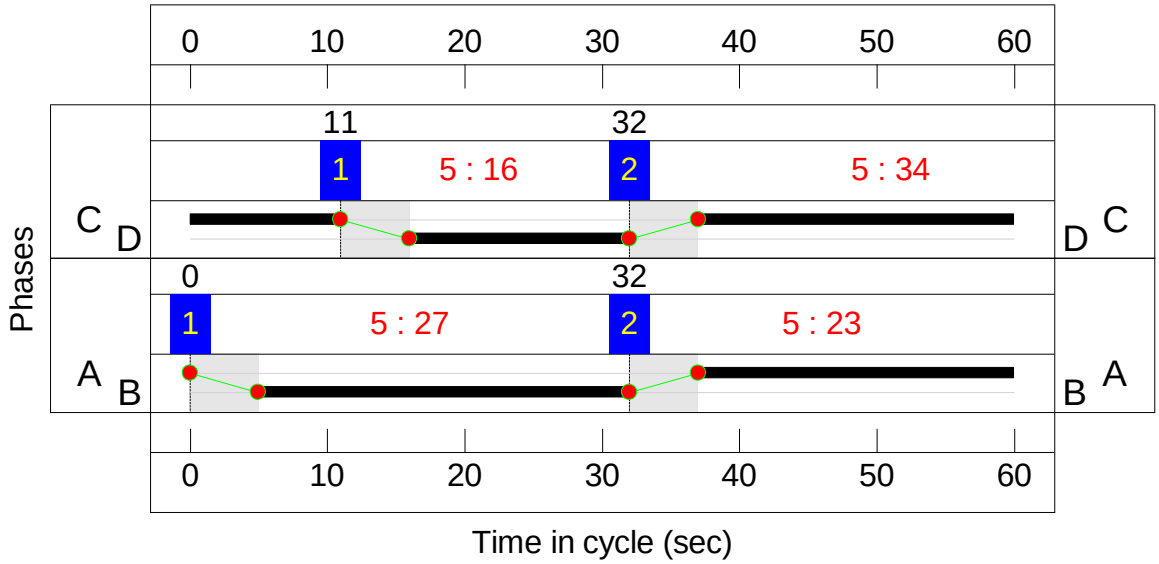


Figure 8-6 - PM Peak Signal Timing and Phasing (Base + Dev)

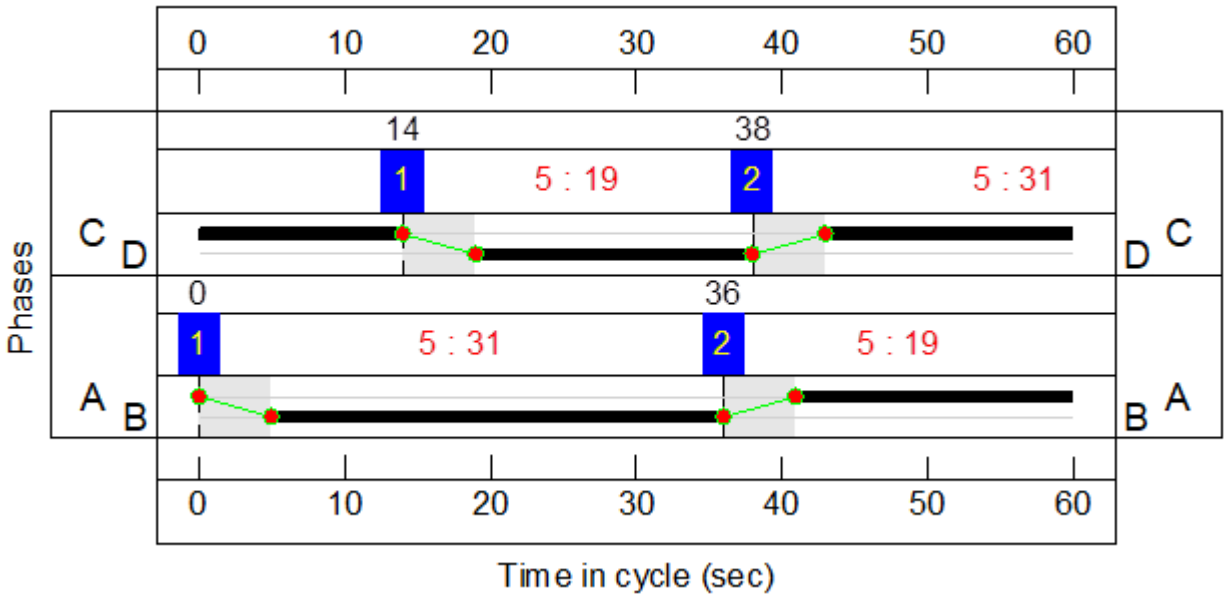


Table 8-22 - Junction 4: 2033 Horizon Year with Development

Lane	AM Peak Period			PM Peak Period		
	Degree of Saturation (%)	Mean Max Queue (pcus)	Average Delay (s/pcu)	Degree of Saturation (%)	Mean Max Queue (pcus)	Average Delay (s/pcu)
A473 N Ahead Left	64.1%	7.5	20.9	51.7%	5.0	21.8
A473 N Ahead	73.4 : 73.4%	9.9	21.7	56.0 : 56.0%	6.0	21.1
M4 East Left	0.0%	0.0	0.0	0.0%	0.0	0.0
M4 East Ahead	68.1 : 68.1%	3.9	6.5	72.3 : 72.3%	4.2	6.4
A473 S Ahead Left	55.7%	7.4	11.2	69.9%	10.3	15.9
A473 S Ahead	75.7%	13.2	15.1	83.9%	15.9	21.3
M4 West Ahead Left	53.3%	1.0	6.7	39.3%	0.3	5.8
M4 West Ahead	66.6%	3.4	18.4	45.9%	1.7	14.9
Gyratory N Right Ahead	73.9%	10.3	14.6	56.4%	3.6	6.7
Gyratory N Right	74.9%	10.0	14.9	58.2%	4.3	7.2
Gyratory S Ahead	46.1%	4.1	21.1	35.7%	3.4	18.0
Gyratory S Right Ahead	76.0%	8.4	31.1	80.6%	10.7	30.4

The results of the Horizon Year 2033 with Development scenario modelling at Junction 4 confirms that the junction would operate within capacity with a PRC of 18.4% across all lanes in the AM peak and 7.3% in the PM peak. The DoS, Mean Max Queues (MMQ) and delay on all links are within capacity. The PRC of the junction only reduces slightly with the addition of development traffic and the DoS, queues and delays are also impacted slightly with the development traffic. The PRC of the junction is reduced by 0.6% in the AM peak and 3.4% in the PM peak. It is not considered that the development would have a severe impact on the operation of this junction.

Table 8-23 provides a summary of the results of the Horizon Year 2033 with Committed Development, whilst the full detailed LinSig report is attached at Appendix F.

The AM Peak signal timing and phasing are shown in Figure 8-7, while the PM Peak signal timing and phasing are shown in Figure 8-8.

Figure 8-7 - AM Peak Signall Timing and Phasing (Base + Comm. Dev)

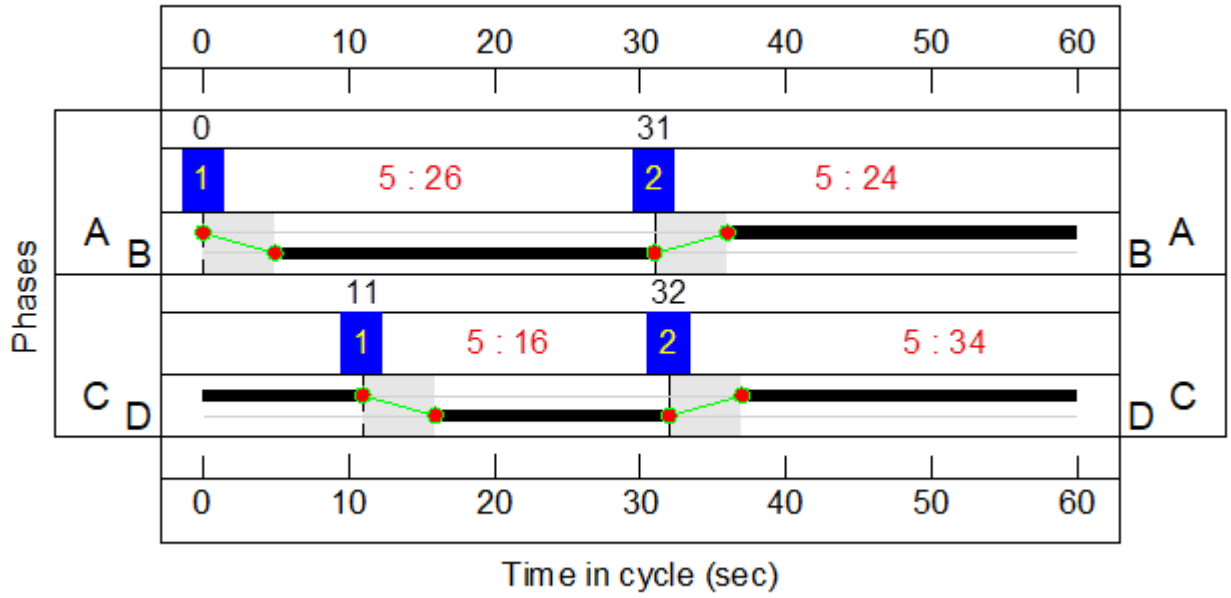


Figure 8-8 - PM Peak Signal Timing and Phasing (Base + Comm. Dev)

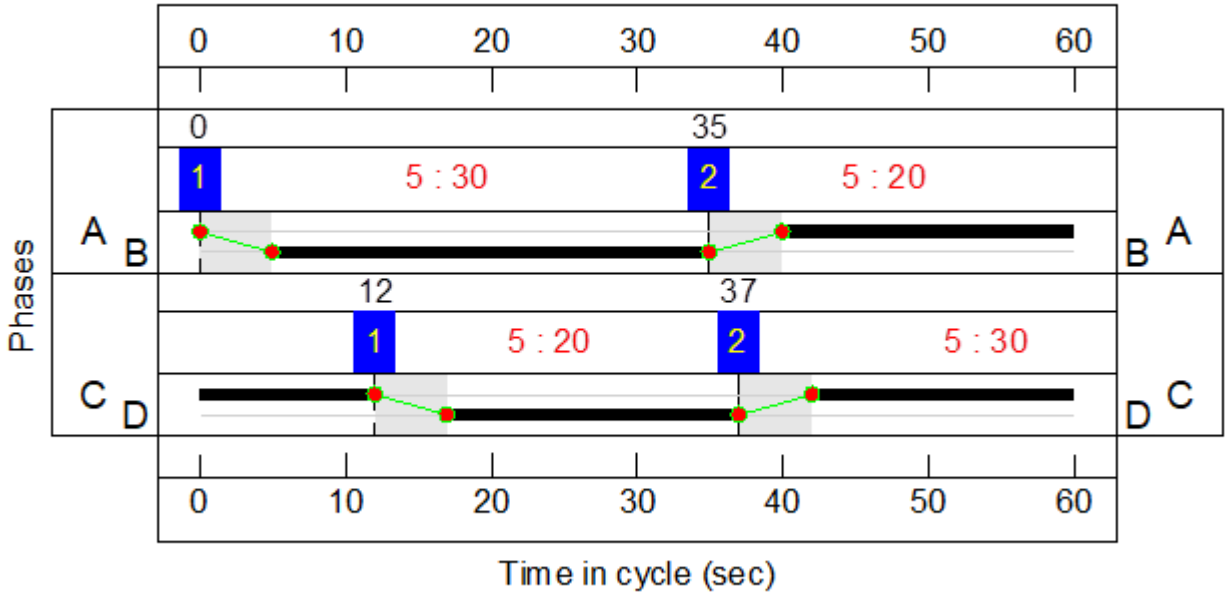


Table 8-23 - Junction 4: 2033 Horizon Year with Committed Development

Lane	AM Peak Period			PM Peak Period		
	Degree of Saturation (%)	Mean Max Queue (pcus)	Average Delay (s/pcu)	Degree of Saturation (%)	Mean Max Queue (pcus)	Average Delay (s/pcu)
A473 N Ahead Left	66.8%	8.2	20.8	51.7%	5.1	20.9
A473 N Ahead	76.7 : 76.7%	11.1	22.1	56.1 : 56.1%	6.1	20.2
M4 East Left	0.0%	0.0	0.0	0.0%	0.0	0.0
M4 East Ahead	71.0 : 71.0%	4.5	7.5	80.2 : 80.2%	6.4	9.4
A473 S Ahead Left	56.3%	7.4	11.3	77.4%	12.4	19.2
A473 S Ahead	75.7%	13.2	15.1	86.6%	17.0	24.3
M4 West Ahead Left	53.9%	1.1	6.8	43.9%	0.6	6.7
M4 West Ahead	67.2%	3.4	18.9	49.5%	1.8	17.1
Gyratory N Right Ahead	76.3%	10.6	16.3	58.5%	4.1	7.2
Gyratory N Right	78.0%	10.8	17.3	59.8%	5.0	8.0
Gyratory S Ahead	47.3%	4.2	21.4	34.5%	3.4	16.9
Gyratory S Right Ahead	77.0%	8.4	31.6	84.3%	12.3	31.9

The results of the Horizon Year 2033 with Committed Development scenario modelling at Junction 4 confirms that the junction would operate within capacity with a PRC of 15.4% across all lanes in the AM peak and 3.9% in the PM peak. The DoS, Mean Max Queues (MMQ) and delay on all links are within capacity. The addition of committed development traffic, without the proposed development traffic, impacts on the PRC of the junction notably more so than the proposed development with the PRC reducing by 3.6% in the AM peak and 6.8% in the PM peak.

Table 8-24 provides a summary of the results of the Horizon Year 2033 with Committed Development and Development, whilst the full detailed LinSig report is attached at Appendix F.

The AM Peak signal timing and phasing are shown in Figure 8-9, while the PM Peak signal timing and phasing are shown in Figure 8-10.

Figure 8-9 - AM Peak Signal Timing and Phasing (Base + Comm. Dev + Dev)

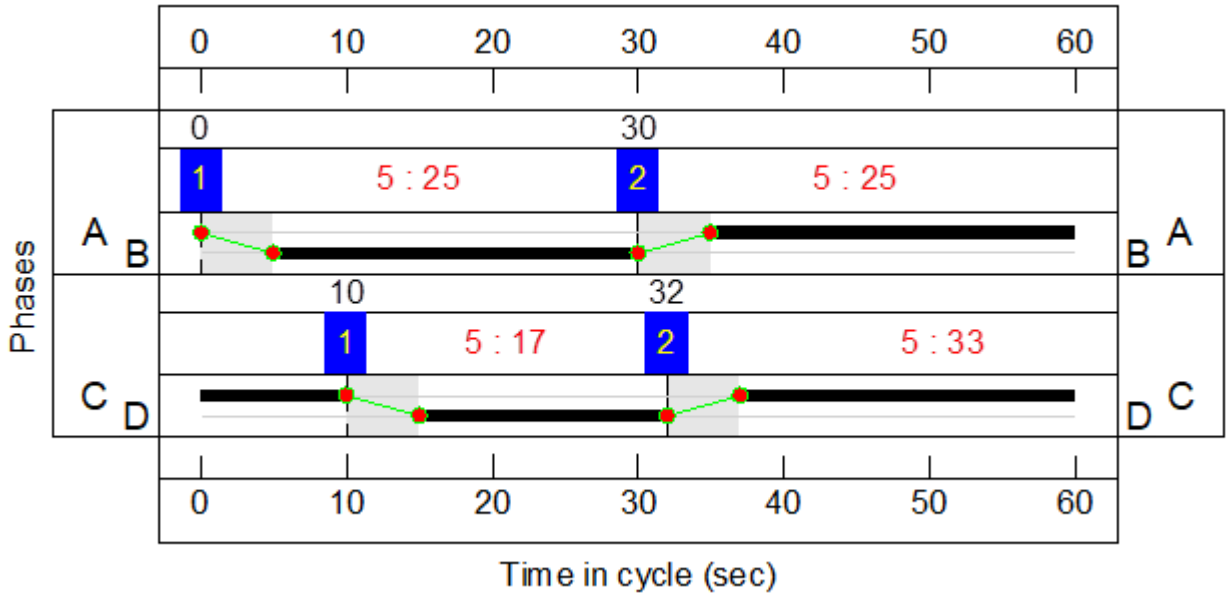


Figure 8-10 - PM Peak Signal Timing and Phasing (Base + Comm. Dev + Dev)

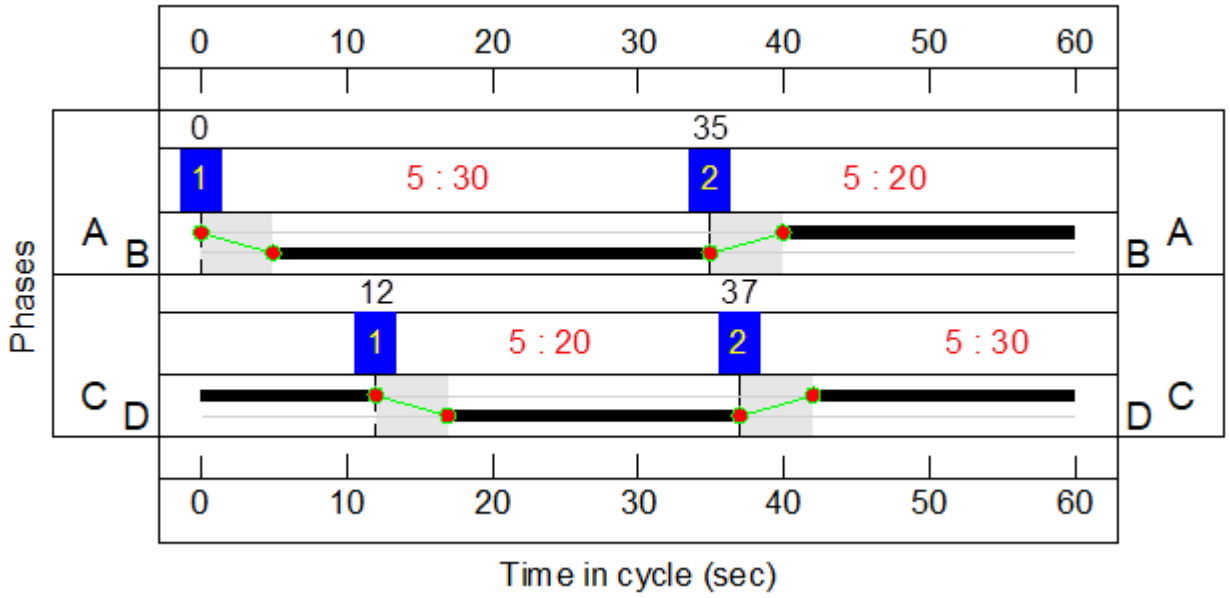


Table 8-24 - Junction 4: 2033 Horizon Year with Committed Development and Development

Lane	AM Peak Period			PM Peak Period		
	Degree of Saturation (%)	Mean Max Queue (pcus)	Average Delay (s/pcu)	Degree of Saturation (%)	Mean Max Queue (pcus)	Average Delay (s/pcu)
A473 N Ahead Left	69.4%	8.9	20.7	54.8%	5.6	21.5
A473 N Ahead	80.2 : 80.2%	12.2	22.7	59.5 : 59.5%	6.7	20.8
M4 East Left	0.0%	0.0	0.0	0.0%	0.0	0.0
M4 East Ahead	75.6 : 75.6%	5.7	9.5	86.1 : 86.1%	9.5	13.6
A473 S Ahead Left	59.3%	8.1	12.3	81.1%	13.6	21.0
A473 S Ahead	77.9%	13.9	16.7	86.6%	17.0	24.3
M4 West Ahead Left	55.5%	1.3	7.2	47.2%	0.9	7.5
M4 West Ahead	68.4%	3.6	20.2	52.6%	1.9	19.0
Gyratory N Right Ahead	79.9%	11.4	18.5	58.8%	4.2	7.3
Gyratory N Right	80.5%	11.6	19.8	59.5%	5.0	8.3
Gyratory S Ahead	46.0%	4.3	20.2	35.0%	3.4	16.9
Gyratory S Right Ahead	75.0%	8.2	29.6	89.4%	14.2	38.9

The results of the Horizon Year 2033 with Committed Development and Development scenario modelling at Junction 4 confirms that the junction would operate within capacity with a PRC of 11.8% across all lanes in the AM peak and 0.7% in the PM peak. The DoS, Mean Max Queues (MMQ) and delay on the majority of links are shown to be within capacity. As above, the impact of both the committed development and development traffic on the operation of the junction reduces the overall PRC of the junction by 7.2% in the AM peak and 10% in the PM peak. When compared to the base with committed development traffic, this is a difference of 3.6% and 3.2%, respectively.

Summary

It is evident that the overall cumulative impact of the committed and proposed development traffic will impact the operation of the junction, particularly on the A473 N junction arm. It is the view of this TA that the impact of the development would be mitigated against by improvements to the Active

Travel network identified in BCBC's INMs, as outlined in Section 3. As indicated previously, it is considered that the assessment is a worst-case scenario and that vehicle trip rates are likely to be less in the future due to the acceptance of working from home as a viable option and the uptake of more sustainable transport modes.

8.4 SUMMARY

The operational capacity assessments of the proposed site access junctions onto the A473 and Felindre Road from the proposed development site are demonstrated to operate well within capacity. It is envisaged that, as the models are not highlighting any queuing on the public highway, there is unlikely to be the need for mitigation in the form of highway improvements to increase capacity as part of this development.

It is clear that the committed development traffic would impact on the operation of Junction 1 to a greater degree than the proposed development on its own. Without committed development, the junction would continue to operate within capacity; however, the committed development results in the desirable operational capacity threshold of 0.85 RFC being exceeded in the AM peak on New Road junction arm (0.99 RFC) but it is still less than 1.0 RFC. On this basis, it is the view of this TA that the development would not have a severe impact on this junction.

It is also clear that the committed development traffic would impact on the operation of Junction 2 to a greater degree than the proposed development on its own. Without committed development, the junction would continue to operate within capacity; however, the addition of the committed development results in the desirable operational capacity threshold of 0.85 RFC being exceeded in the AM peak on Penybont Road (NE) junction arm (0.93 RFC) but it is still less than 1.0 RFC. On this basis, it is the view of this TA that the development would not have a severe impact on this junction.

It is evident that junction 3 would operate within operational capacity thresholds for all scenarios modelled. It is therefore the view of this TA that the proposed development would not have a severe impact on the operation of junction 3.

It is evident that the overall cumulative impact of the committed and proposed development traffic will impact the operation of Junction 4, particularly on the A473 N junction arm. It is the view of this TA that the development traffic alone would not have severe impact but that the cumulative impact of committed and proposed developments in the area is likely to have a notable impact on the junction's operation. It is the view of this TA that the impact of the development would be mitigated against by improvements to the Active Travel network identified in BCBC's INMs, as outlined in Section 3. As indicated previously, it is considered that the assessment is a worst-case scenario and that vehicle trip rates are likely to be less in the future due to the acceptance of working from home as a viable option and the uptake of more sustainable transport modes.

On this basis, it is the view of this TA that the proposed development would not have a severe impact on the operation of the local highway network.

9 SUSTAINABLE TRANSPORT IMPACT

This chapter provides a summary of the impact of the impact of the proposed development on the sustainable transport network. The impact on sustainable transport services and active travel infrastructure in the area has been based on the multimodal trip generation analysis for the proposed development discussed within Section 5.

9.1 PUBLIC TRANSPORT

9.1.1 BUS, MINIBUS OR COACH

The mixed private dwelling proposals are anticipated to generate approximately four (4) two-way trips on bus, minibus or coach in the weekday AM peak and five (5) two-way trips in the PM peak. These numbers are considered to have a negligible impact on local public transport and could be easily accommodated on the existing network.

The mixed affordable dwellings are anticipated to generate a single trip in the AM peak period and a single trip in the PM peak period. These trips are considered negligible in terms of their impact on the existing bus services, and therefore could easily be accommodated.

The primary school proposals are anticipated to generate approximately 26 two-way trips on bus, minibus or coach in the weekday AM peak and no trips in the PM peak. These numbers are considered to have a negligible impact on local public transport and could be easily accommodated on the existing network.

In total, the development would be expected to add 31 two-way trips on buses in the AM Peak period and six (6) two-way trips in the PM peak hour. The existing public transport network is considered capable of accommodating this additional demand. There are frequent bus services stopping in the vicinity of the site which provide links to multiple destinations in the surrounding area, including Bridgend town centre.

9.1.2 RAIL

As outlined in Section 3.5 Pencoed Railway Station is located approximately 900m to the southwest of the development site. 900m is considered to be an acceptable walking distance and can provide residents with the means to travel to Bridgend and Cardiff.

The mixed private dwelling proposals are anticipated to generate approximately 22 two-way trips via rail in the weekday AM peak and 24 two-way trips in the PM peak. These numbers are considered to be low enough that they can easily be accommodated on the existing train services.

It is anticipated that the mixed affordable element of the proposed development will generate approximately three (3) two-way trips in the AM peak and four (4) two-way trips in the PM peak. As above, it is considered that the low number of additional trips would have a negligible impact on both the existing train services.

The primary school proposals are anticipated to generate approximately two (2) two-way trips via rail in the weekday AM peak and no trips in the PM peak. These numbers are considered to be low enough that they can easily be accommodated on the existing train services.

In total, the development would be expected to generate 27 two-way and 28 two-way trips by train in the AM and PM peak hours, respectively. The existing train services are considered capable of

accommodating this additional demand. There are train services at Pencoed station which provide links to a number of destinations in the surrounding area, including Bridgend and Cardiff.

9.2 ACTIVE TRAVEL

9.2.1 WALKING

The mixed private dwelling element of the proposed site is anticipated to generate approximately 28 two-way trips on foot in the AM peak period and 28 two-way trips in the PM peak period. The mixed affordable dwelling element is anticipated to generate approximately three (3) two-way trips on foot in the AM peak period and five (5) two-way trips in the PM peak period. It is considered that this increase in pedestrian trips can be easily accommodated on the existing pedestrian network.

The primary school proposals are anticipated to generate approximately 170 two-way trips via walking in the weekday AM peak and six (6) trips in the PM peak. These numbers are considered to be low enough that they can easily be accommodated on the existing network.

The total number of pedestrian trips that are anticipated to be generated by the total development would be approximately 200 two-way trips via walking in the weekday AM peak and 40 trips in the PM peak. These numbers are considered to be low enough that they can easily be accommodated on the existing network.

As discussed within Section 3.6, existing footway provision in the vicinity of the site is sufficient and provides residents in the local area with the means to access key facilities by walking, such as food, health, educational and public transport facilities in Pencoed. Penybont Road provides a key connection to public transport infrastructure, including bus stops and Pencoed railway station.

It is also noted that there are proposed improvements to active travel infrastructure in the area, as demonstrated in Figure 3-3. These improvements, and the intention of the development to be designed to make active travel more attractive and convenient, will ensure that walking is a dominant mode of travel for the future residents of the development.

9.2.2 CYCLING

Proposals for the mixed private dwellings are anticipated to generate approximately four (4) two-way trips by cycling in the weekday AM peak and five (5) two-way trips in the PM peak. The mixed affordable dwellings would be anticipated to generate approximately a single trip in the AM peak period and a single trip in the PM peak period by cycling.

The primary school proposals are anticipated to generate approximately four (4) two-way trips via bicycle in the weekday AM peak and no trips in the PM peak. These numbers are considered to be low enough that they can easily be accommodated on the existing network.

The total number of cycling trips expected as a consequence of the development would be nine (9) two-way cycling trips in the AM peak and six (6) in PM peak hours. It is considered that this increase in cycling trips can be easily accommodated on the network.

It is also noted that there are proposed improvements to active travel infrastructure in the area, as demonstrated in Figure 3-3. These improvements, and the intention of the development to be designed to make active travel more attractive and convenient, will ensure that cycling is a dominant mode of travel for the future residents of the development.

9.3 SUMMARY

It is the view of this TA that the anticipated trip generation for sustainable modes of travel would be able to be easily accommodated on the exiting sustainable transport network in the vicinity of the site. It is also considered that, as part of any future development, contributions, in line with the level of development, toward improvements to existing services and active travel infrastructure would be provided to ensure that future residents are able to choose to travel sustainably. As indicated in Section 3 of this report, there are several routes proposed as part of BCBC's INMs which directly benefit the site, improving access to Pencoed village centre and the train station. Contributions toward, or provision of sections of, these routes could form part of any mitigation measures.

10 OUTLINE TRAVEL PLAN

10.1 INTRODUCTION

This chapter outlines a potential Travel Plan strategy to be implemented alongside the proposed development. Targeted Travel Plan measures can significantly reduce car journeys from a site. These measures can be especially effective when a site has made provision for sustainable transport modes in its masterplans.

An assessment of the forecasted switch from single occupancy car journeys to sustainable choices of travel, due to the travel plan measures set out below, is provided as part of this chapter.

10.2 POTENTIAL TRAVEL PLAN OBJECTIVES

A review of current national, regional and local policies relevant to the proposed scheme has assisted in developing the following objectives for a potential Travel Plan:

Objective 1: To minimise the number of private vehicle trips being made to and from the site;

Objective 2: To promote and facilitate travel by foot, cycle and bus as an attractive choice for travel to / from the development for people of all ages and abilities;

Objective 3: To ensure safe movement to / from the development and within the site by all travel modes, accounting for needs of people of various disabilities; and,

Objective 4: To promote and raise awareness of the benefits of healthier and more environmentally friendly travel to / from the development.

As the scheme evolves, additional objectives may be developed to underpin the strategy of a full Travel Plan.

10.3 TRAVEL MODE TARGETS

All Travel Plans should include SMART (Specific, Measurable, Achievable, Realistic, Timebound) targets related to the objectives of the travel plan.

10.4 POTENTIAL TRAVEL PLAN MEASURES

Guidance on residential Travel Plans is provided within DfT's 'Guidance on Travel Plans' document. Potential Travel Plan measures would be recommended in consideration of this document.

10.4.1 DEVELOPMENT MASTERPLAN

The development of a masterplan for a scheme is central to identifying both the potential of the site in sustainable travel terms, but also in developing sustainable travel measures to encourage residents to travel in a healthier and more environmentally friendly way.

To supplement existing active travel provision in the vicinity of the site, indictive masterplan proposals include for seven (7) new pedestrian access points. Such proposals will improve the connectivity of the site by active travel with its surrounding area, including key amenities and facilities in Pencoed and beyond. The masterplan will ensure that active travel modes, including walking and cycling, will be attractive and convenient.

The level of parking provided within the development will be set in accordance with Bridgend County Borough Council parking standards. This will ensure that parking standards will not be set at a level that will both encourage high levels of car ownership and offset the potential benefits of the sustainable travel measures put forward.

10.4.2 TRAVEL PLAN COORDINATOR

It is recommended that a Travel Plan Coordinator (TPC) is appointed for the proposed development. This coordinator would be based in the sales and marketing office for the site. Responsibilities of the TPC include providing 'welcome packs' with information on sustainable travel options within the area and providing further advice on making decisions on transport within the area.

The TPC will also be responsible for updating the development masterplan, whilst liaising with local residents and Bridgend County Borough Council.

10.4.3 INFORMATION PACK

As stated above, an information pack could be provided for all new residents. The information pack may include the following information:

- Bus route maps and timetables;
- Walking and cycling route maps to key facilities;
- Information on car-sharing, including details of car-sharing websites;
- Information on home shopping delivery;
- Information on local taxi companies; and,
- Contact details of the Travel Plan Coordinator.

Details of the Travel Plan Information Pack should also be displayed within the development's sales and marketing office. This should be updated on a regular basis, particularly as bus timetables change.

10.4.4 MONITORING

In order to monitor the effectiveness of the Travel Plan and its initiatives, it is recommended that a comprehensive monitoring and review programme is considered. The programme will ensure that the measures are delivered in a structured manner and achieve the Travel Plan objectives.

Monitoring of travel habits of residents will be undertaken through an annual survey which will be carried out throughout the lifespan of the travel plan. This will be coordinated by the Travel Plan Coordinator.

Monitoring results and analysis will be reported to Bridgend County Borough Council.

10.4.5 TIMEFRAME

It is recommended that the implementation of Travel Plan measures and monitoring be maintained through the construction of the development until the last house is sold. Due to the large scale of the site, this should allow time for a significant modal shift to be achieved.

11 SUMMARY AND CONCLUSIONS

11.1 SUMMARY

WSP has been appointed by Bridgend College to produce a Transport Assessment (TA) as part of the ongoing promotion of surplus land at their Pencoed Campus through the Replacement Local Development Plan (LDP). The proposed site is being put forward for up to 770 dwellings and a 1 form of entry primary school situated off the A473 in Bridgend.

The development site is located on land adjacent to Bridgend College's Pencoed Campus. This Transport Assessment is being prepared in support of Stage 2 of the Candidate Site Assessment.

It is proposed that two new vehicle accesses to the site will be included as part of the development and would take the form of a priority T-junctions directly from the A473 to the north and Felindre Road to the south. The junctions will be the primary access points for pedestrians, cyclists, refuse/servicing vehicles, and will also provide emergency access.

The site will be designed so that it is fully permeable, with pedestrian access provided through the site. Street lighting and dropped kerbs and tactile paving will be provided throughout the site.

The TA demonstrates:

- The proposals fully comply with national, regional and local policy objectives, in that they will provide adequate car and cycle parking provision, and are sustainable from a transport and highways perspective;
- The site currently has good accessibility by sustainable non-car modes of travelling, such as foot, and public transport; however, the INMs indicate that BCBC has aspirations of a number of routes, as highlight in Section 3, which will significantly improve the accessibility of the site by all sustainable non-car modes of travel, including cycling;
- The site is well connected to key local facilities and amenities, and includes the delivery of a1 FE primary school onsite;
- The proposed access arrangements have demonstrated that the planned junctions are appropriate for the scale of the development;
- There are no common trends or patterns in collisions on the local highway network over the most recent five-year period, and the proposals will not negatively impact on highway safety;
- The proposed site access arrangements would operate within capacity and thus the development would not result in a severe impact on the local highway network at these locations; and,
- Junctions 1-3 of the assessment are not considered to be severely impacted by the proposed development; however, Junction 4 (Junction 35 of the M4) is expected to be impacted by the development, particularly when the committed development traffic is added to the network. On this basis, the impact of the development could be mitigated against by improvements to the Active Travel network identified in BCBC's INMs, as outlined in Section 3.

The proposals meet requirements set out within Planning Policy Wales, in that they provide safe and enhanced access for all users and do not negatively impact on the operation of the local highway network surrounding the application site.

As indicated in Section 3 of this report, there are several routes proposed as part of BCBC's INMs which directly benefit the site, improving access to Pencoed village centre and the train station.

Contributions toward, or provision of sections of, these routes could form part of any mitigation measures.

An outline travel plan for the proposed development has been prepared as part of this TA. The objective of the outline TP is to commit to the promotion of the use of sustainable modes of travel with the aim of reducing single occupancy vehicle trips.

11.2 CONCLUSIONS

It is the view of the TA that the development proposals are in accordance with national, regional and local policy. The proposals will not likely generate a significant number of trips and modelling demonstrates that the trips would not have a significant impact on the operation and safety of the local highway network.

It can therefore be concluded that the proposed development at Land adjacent to Pencoed Campus is acceptable in terms of highway and transportation.

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