

TRANSPORT ASSESSMENT

Barratt Homes

Land north of Llewellyn Road,
Penllergaer

April 2021

Swansea Council

Transport Assessment
Version 2

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1 Introduction

Background

- 1.1 Vectos is appointed by Barratt Homes to provide traffic and transportation advice in support of an full planning application for the proposed development of land north of Llewellyn Road, Penllergaer. The proposed development comprises 180 residential dwellings with a new primary access provided via Mount Crescent and Llewellyn Road.
- 1.2 This site is allocated as a committed housing site within the Swansea Council (SC) Local Development Plan (LDP) (2019) for up to 200 residential dwellings.
- 1.3 This Transport Assessment (TA) sets out the transport matters relating to the development, including the provision for pedestrians, cyclists and public transport users. This report also considers the effects of the development on the local highway network.

Objectives

- 1.4 The key objectives of this TA are to:
 - Identify opportunities for non-car based travel and socially inclusive transport links;
 - Forecast the quantum of people and vehicle trips generated by future residents of the development;
 - Measure the development traffic effect on the local highway network based on percentage traffic demand change and using the appropriate traffic modelling software; and
 - Present suitable mitigation measures where required to maximise the development's accessibility and connectivity.

Planning History

- 1.5 A previous application for 200 dwellings gained a resolution to grant permission but the application was disposed of because the S106 Agreement was not signed. The site remains as a committed development site for 200 units in the SC Adopted LDP (adopted February 2019).
- 1.6 In the interim, additional land to the west of the site was allocated for (non-strategic) housing in the LDP under reference H1-27, providing an overall site of circa 7.35 Ha in size when combined with the existing allocation.
- 1.7 Most of land associated with the proposed and additional allocated sites was allocated for residential development in the SC Unitary Development Plan (UDP) (adopted November 2008) (ref: HC1 (91) refers) for up to 250 dwellings.

Scoping

- 1.8 The scope of this TA has been discussed and agreed with Highways Officers at SC. It has been prepared in accordance with, and in recognition of the latest local and national government guidance including the Welsh Governments Technical Advice Notes (TAN) 18 (2007) and refers to current national and local transport policy documents.
- 1.9 An initial pre application response was received from SC on the 22nd October 2020, while further discussions were held with officers on the 5th November 2020. Response to the TA Scoping Note was received from SC on the 10th November 2020, copies of which are provided in **Appendix A**.

Report Structure

- 1.10 The structure of this report is as follows:
- **Section 2** – presents a description of the application site; its proximity to local community facilities and the existing highway infrastructure and transport networks;
 - **Section 3** – provides a brief overview of local and national policy and demonstrates the development's compliance with these policies;
 - **Section 4** – describes the proposed development, access arrangements, parking and servicing strategy along with associated highway improvements;
 - **Section 5** – includes the multimodal trip generation of the proposed development and sets this out for the peak periods;
 - **Sections 6** – sets out the traffic effect through junction modelling;
 - **Sections 7** – details the transport implementation strategy; and
 - **Sections 8** – provides a summary and conclusion.

2 Existing Conditions

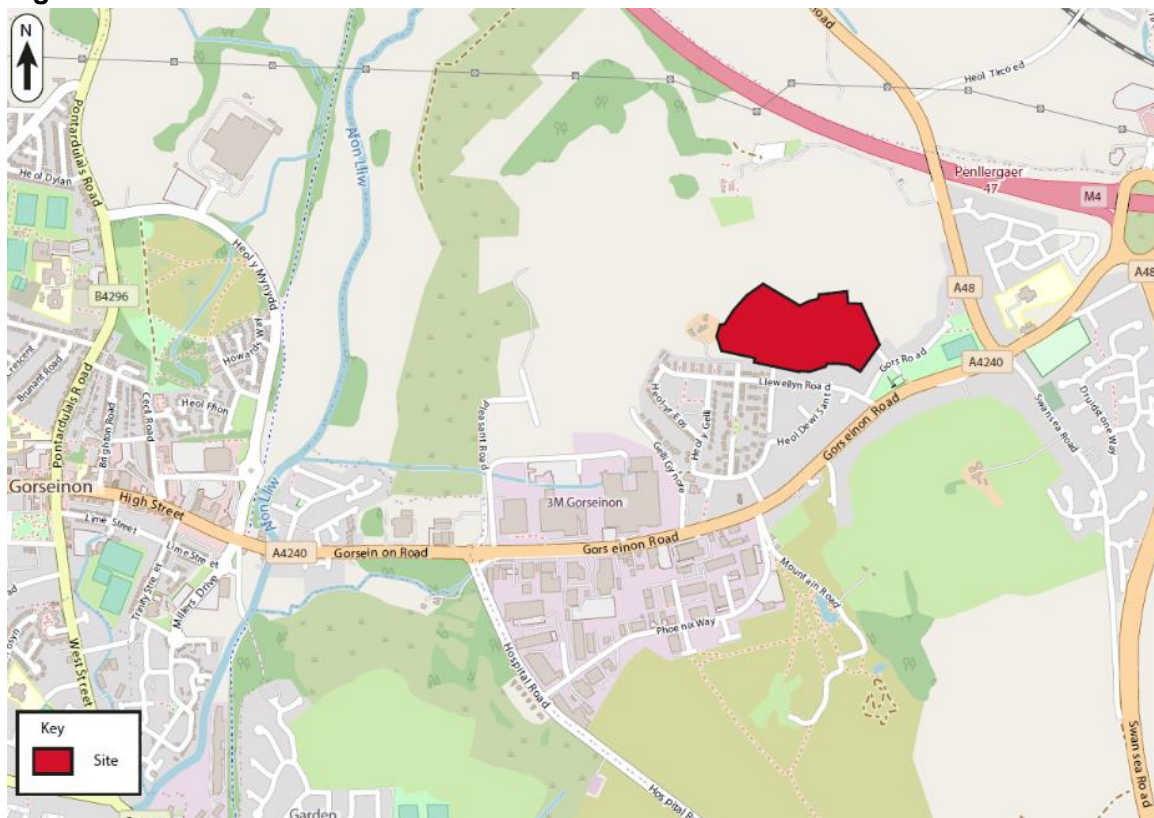
Overview

- 2.1 This section of the report includes a detailed review of the existing transport network surrounding the site and the local areas of Penllergaer and Gorseinon.
- 2.2 The site, currently farmland, comprises land either side of two pasture fields and is currently accessed by an unnamed lane from Gors Road and off Llewellyn Road.

Location

- 2.3 The site is located in Penllergaer, to the north of Llewellyn Road. Penllergaer is a village located to the east of Gorseinon and is situated approximately 7 km north west of Swansea city centre, near Junction 47 of the M4.
- 2.4 The site is near several existing local facilities in both Penllergaer and Gorseinon, including bus stops, schools, medical facilities and local shops.
- 2.5 The site is bound to the north by agricultural land, and to south by properties fronting Llewellyn Road. The prominent land uses in the vicinity of the site are residential to the south and agricultural to the north, east and west. The site location is shown in **Figure 2.1**.

Figure 2.1 – Site Location



Existing Travel Behaviour

- 2.6 In order to quantify the existing travel patterns in the area, journey to work data from the 2011 Census has been reviewed. This provides an overview of the modal split for journeys in the area. The site sits within the Middle Layer Super Output Area (MSOA) W02000171: Swansea 004, and data for this area has been assessed. This data is useful in providing an understanding of the general travel behaviour of residents in Penllergaer, and therefore provides an indication of how residents of a new development might travel. A summary of existing travel is contained in **Table 2.1**.

Table 2.1 – Resident’s Method of Travel to Work (2011 Census)

Mode	Swansea 004 (MSOA)
Underground, metro, light rail, tram	0.1%
Train	0.4%
Bus, minibus or coach	3.3%
Taxi	0.3%
Motorcycle, scooter or moped	0.7%
Driving a car or van	84.8%
Passenger in a car or van	5.4%
Bicycle	0.4%
On foot	4.4%
Other method of travel to work	0.2%
Total	100%

- 2.7 The mode share summarised in **Table 2.1** demonstrates that 84.8% of existing residents in Swansea 004 MSA currently travel to work by driving a car or van. This is likely due to being in close proximity to a number of A roads and the M4. A proportion of 4.8% of residents travel by foot or bicycle, whilst 3.3% travel by bus. There are 5.4% of residents travelling as a passenger in a car or van.

Local Facilities

- 2.8 One of the primary factors to be considered when determining the suitability of a new development is its proximity, accessibility, and connectivity in relation to key local facilities by non-car modes.
- 2.9 A number of schools and local facilities are located in Penllergaer and Gorseinon. These facilities are shown in **Figure 2.2**, and the walking and cycling distances from the site access are shown in **Table 2.2**.

Figure 2.2 – Local Facilities Plan

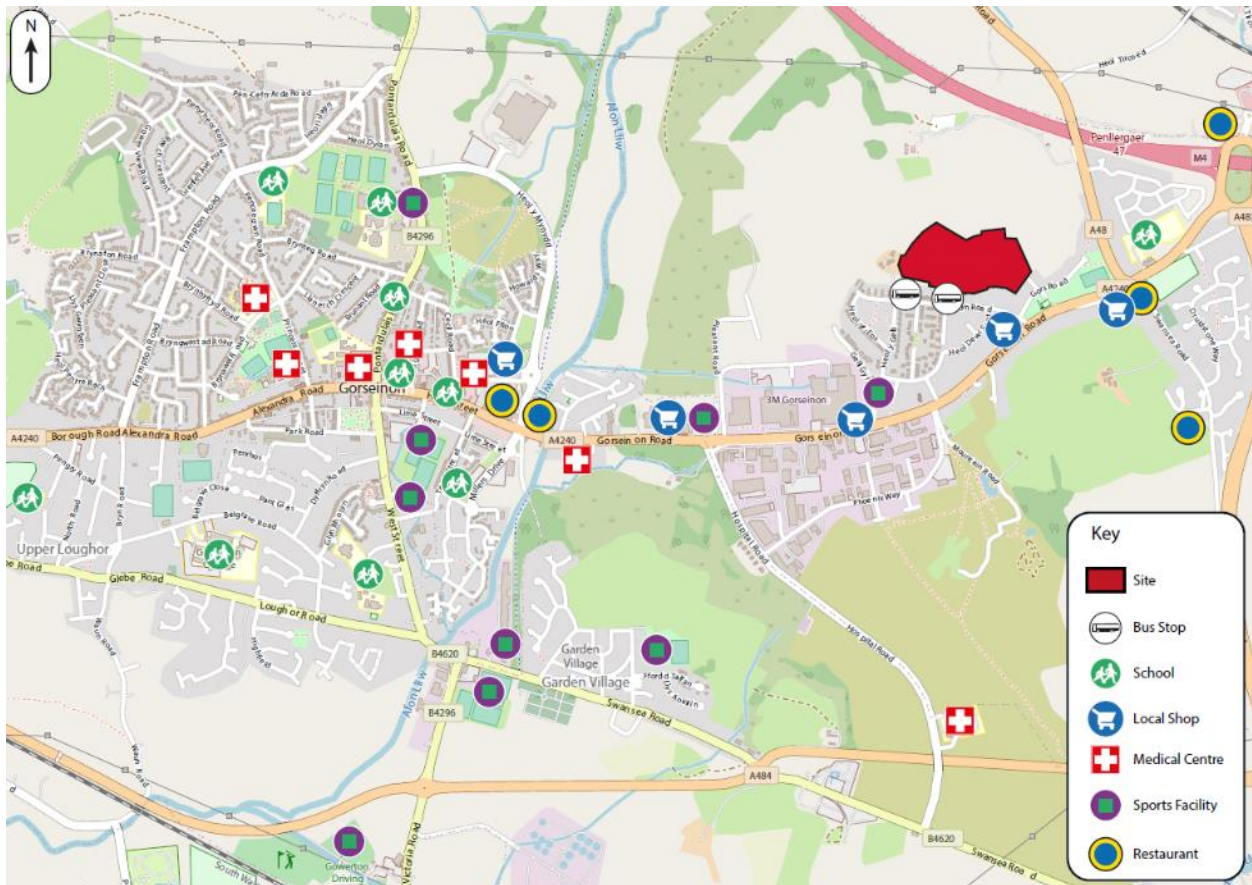


Table 2.2 – Local Facilities

Local Facility	Distance from the centre of the site (meters/Kilometres)	Walking Time (mins)	Cycling Time (mins)
Public Transport			
Morgan Close Bus Stops	250m	3	1
Heol Dewi Sant Bus Stop	300m	5	2
Gowerton Railway Station	5km	60	19
Schools			
Busy Bees Day Nursery	940m	13	5
Penllergaer Pre School	940m	13	5
Penllergaer Primary School	1km	15	5
Musicality Academy	2.5km	29	9
Little Monkeys Day Nursery	2.5km	30	10
Doodles Day Nursery	2.9km	36	11
Gorseinon Juniors School	2.9km	35	11

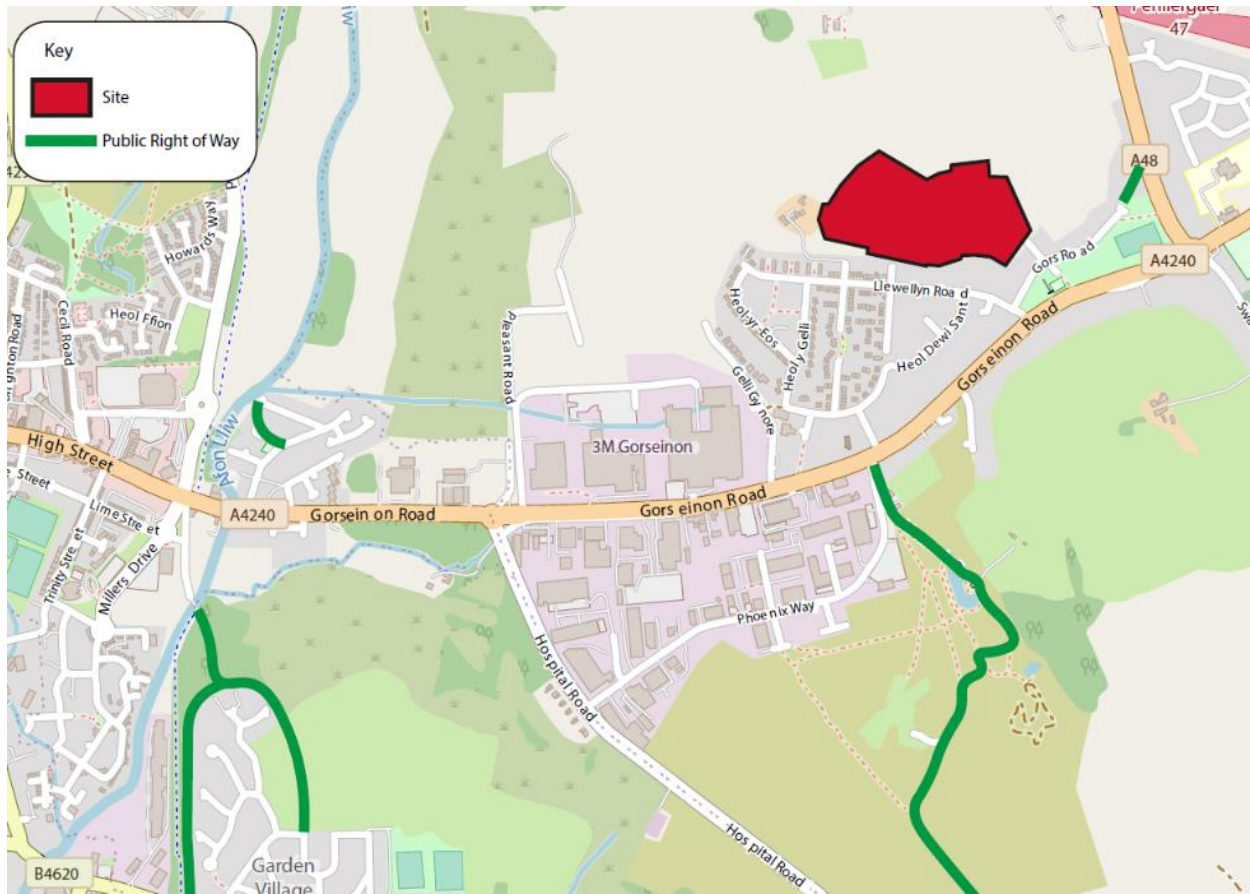
Local Facility	Distance from the centre of the site (meters/Kilometres)	Walking Time (mins)	Cycling Time (mins)
Penyrheol Comprehensive School	3.4km	40	14
Pontybrenin Primary School	3.5km	42	12
Gower College Swansea, Gorseinon Campus	3.8km	49	15
Local Shops			
Post office and Premier convenience store	350m	6	2
Esso Rontec Cross	840m	12	4
Lidl	990m	11	5
Farmfoods	1.5km	19	6
Asda Gorseinon Superstore	2.4km	29	9
Medical Centres			
Gorseinon Dental Practice (Former RA Elliott)	2.4km	29	9
Asda Gorseinon Superstore Pharmacy	2.4km	30	9
Ty garnoch hospital	2.6km	32	11
Gorseinon Hospital	3.3km	42	13
Pub / Restaurants / Food			
Old Inn	990m	12	5
Goggi's Cuisine	1.3km	19	7
Bakers Wales	1.8km	21	7
Seagers	2km	25	7
Leisure / Sports Facilities			
The Fitness Studio	1.5km	18	6
Gorseinon Rugby Club	2.5km	31	9
G&K Karate and Kickboxing Club	2.6km	33	10

- 2.10 **Table 2.2** demonstrates that the site is well connected and accessible by foot (15-30 minutes) or by bicycle (under 15 minutes) to a wide range of local amenities including local schools, food stores, health facilities and local high streets. Beyond these distances and travel times an even broader range of facilities are available.
- 2.11 The site accords with local and national policy in this respect offering real transport choice, improving health and wellbeing and being socially inclusive.

Walking

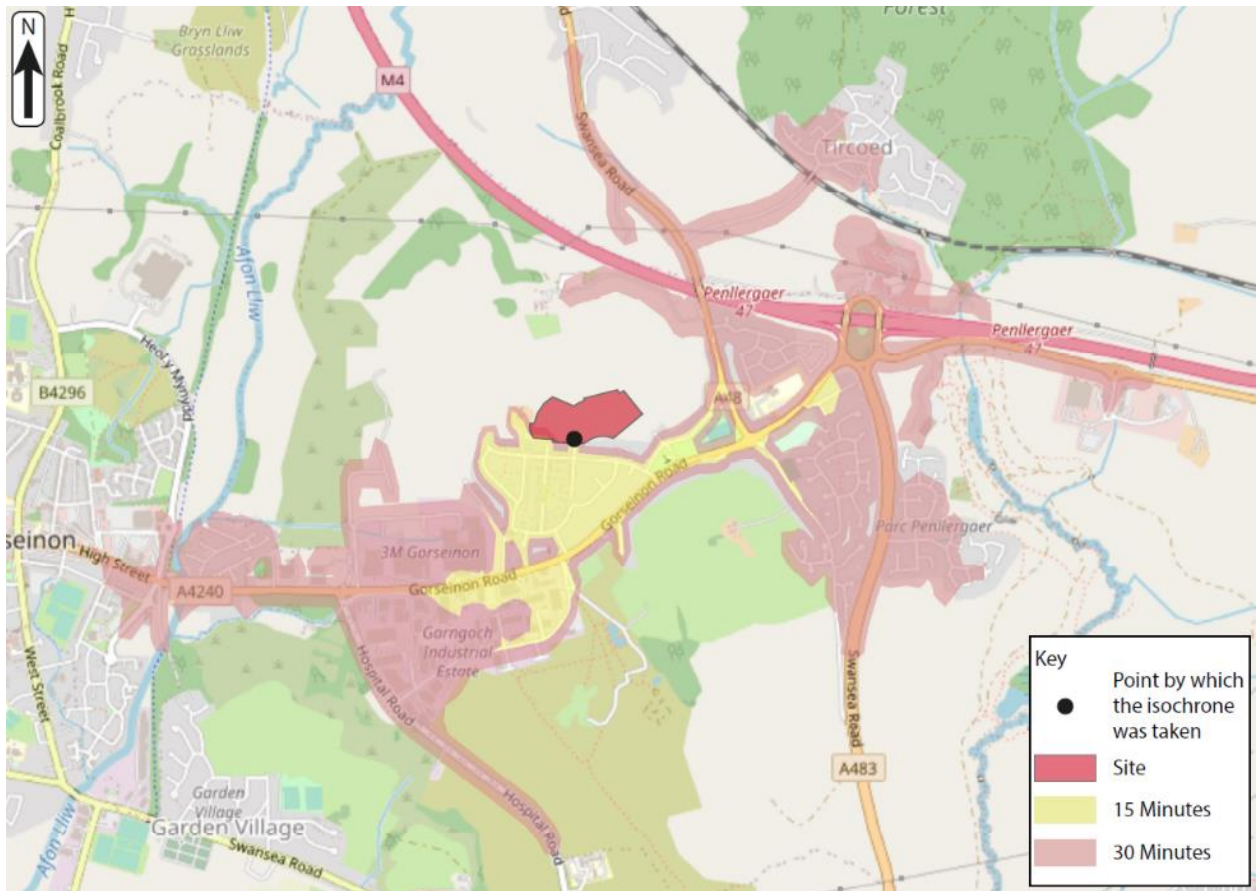
- 2.12 New residents at the proposed development will be encouraged to undertake shorter journeys by foot or bicycle where appropriate. The location of the site is suited for the promotion of active travel journeys to the local shops and services.
- 2.13 Furthermore, the Covid-19 pandemic has seen people travelling shorter distances for essential journeys, often within their local communities rather than further afield. There has also been increased take-up of active modes of travel replacing short distance car trips.
- 2.14 This area is served by good quality pedestrian routes and through attractive and active environments. Existing pedestrian facilities in the vicinity of the site include formal footways, shared footway/cycleways and Public Rights of Way (PRoW).
- 2.15 In the vicinity of the site, there is continuous footway on both sides of Mount Crescent, leading onto Llewellyn Road. The footway is of good condition and there is street lighting present along the length of Llewellyn Road. There are traffic calming features present along Llewellyn Road which assists in reducing traffic speed and helps create a safe pedestrian environment.
- 2.16 There are also continuous, well-lit footways, between 2-2.5 meters in width along the length of Heol-Yr-Eos, Heol-Y-Gelli and Mount Crescent, which lead south away from the site towards Gorseinon Road (A4240).
- 2.17 Along Gorseinon Road there are well-lit continuous footways, with a number of informal pedestrian crossings with pedestrian refuge islands. Due to its close proximity to a school, there is a variable speed limit towards the eastern end of Gorseinon Road near the Swansea Road roundabout that limits traffic to 20mph during school start and finish times.
- 2.18 There are also a number of PRoW's in the vicinity of the site. These are shown in **Figure 2.3**.

Figure 2.3 – Public Rights of Way in the vicinity of the site



- 2.19 The site is well located in terms of proximity and easy access by foot or bicycle to a number of local facilities. The short section of PRoW to the east of the site will be an important connection to the eastern side of the A48, where a primary school, nursery and local shops are located. The PRoW to the south west of the site provides access to Kingsbridge where multiple sports facilities are located.
- 2.20 The propensity for people to walk or cycle depends on individual preferences and circumstances. These circumstances might include, for instance, the purpose of the journey, the attractiveness or, and activity along, the route, the weather, and the cost of alternatives.
- 2.21 The thrust of land use and transport policy is to promote and encourage the choice of walking and cycling as a priority. New development should be designed to promote and encourage it.
- 2.22 **Figure 2.4** indicates the walking isochrones of 15 and 30 minutes from the access point to the site, assuming a comfortable average walking speed of 5 km/hr (3 mph).

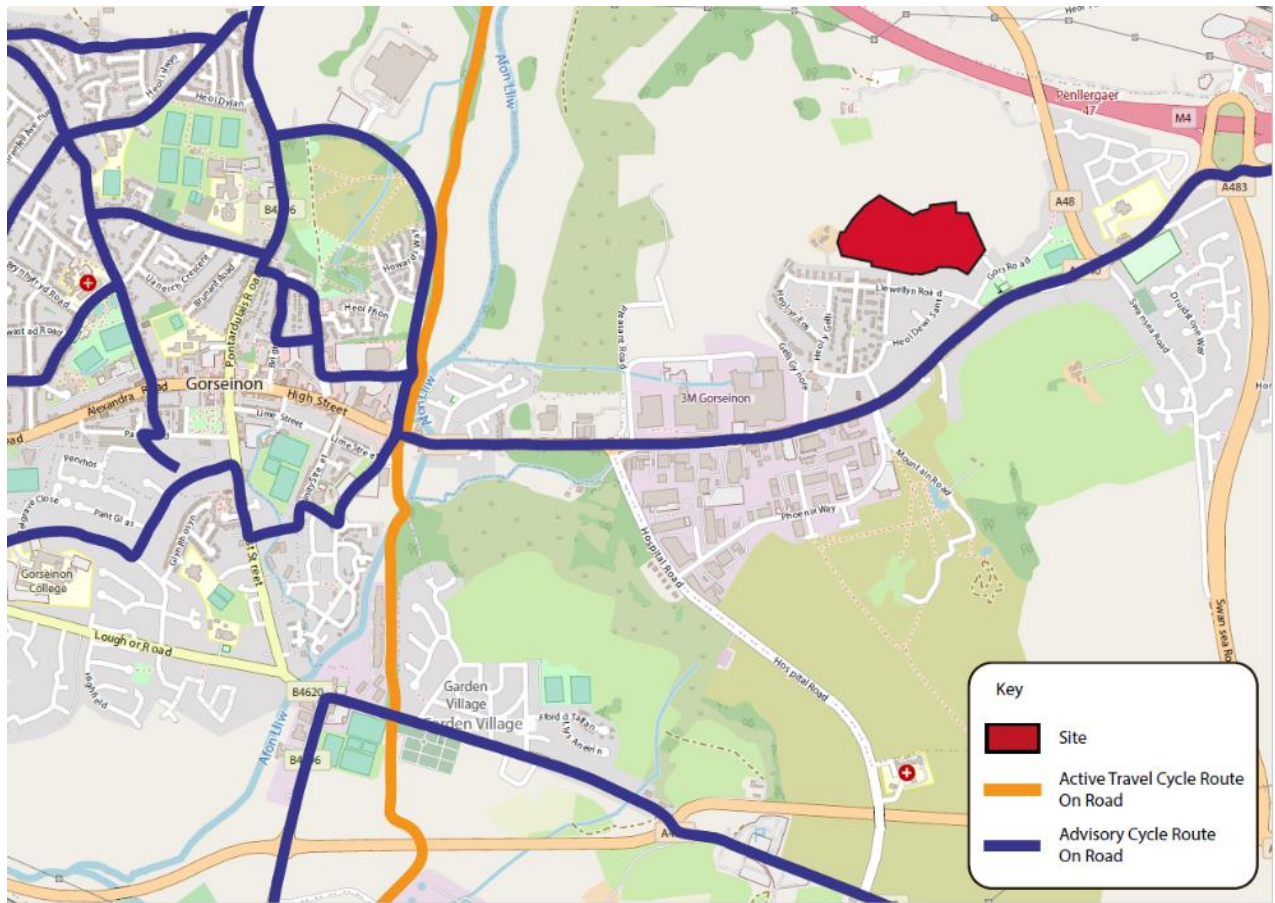
Figure 2.4 – Walking Isochrones from the access point of the site



Cycling

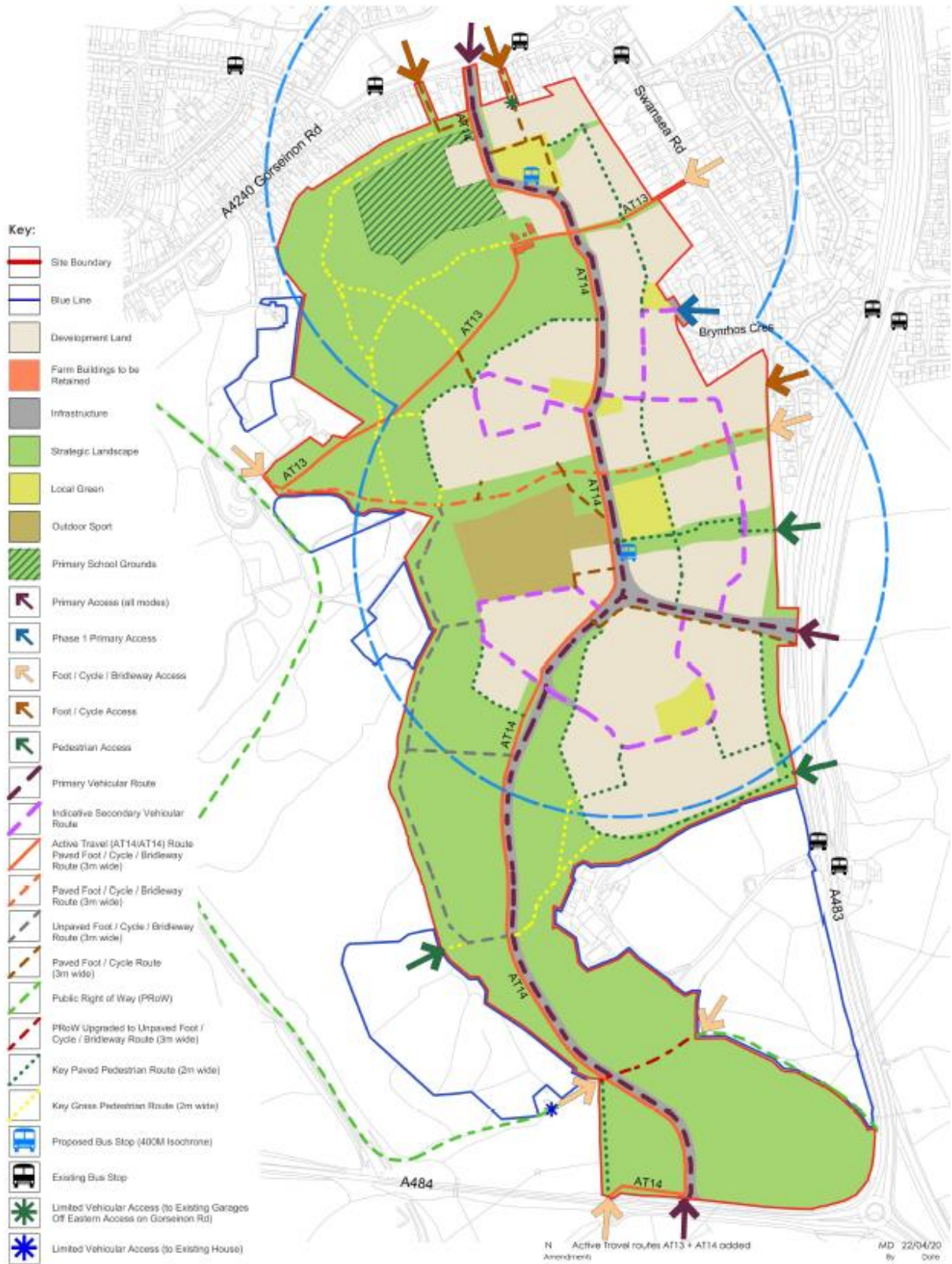
- 2.23 There is a mixture of advisory cycle lanes and shared foot/cycleways in the vicinity of the site.
- 2.24 **Figure 2.5** shows the location of these routes, which are taken from SC Cycling Map.

Figure 2.5 – Local Cycle Routes



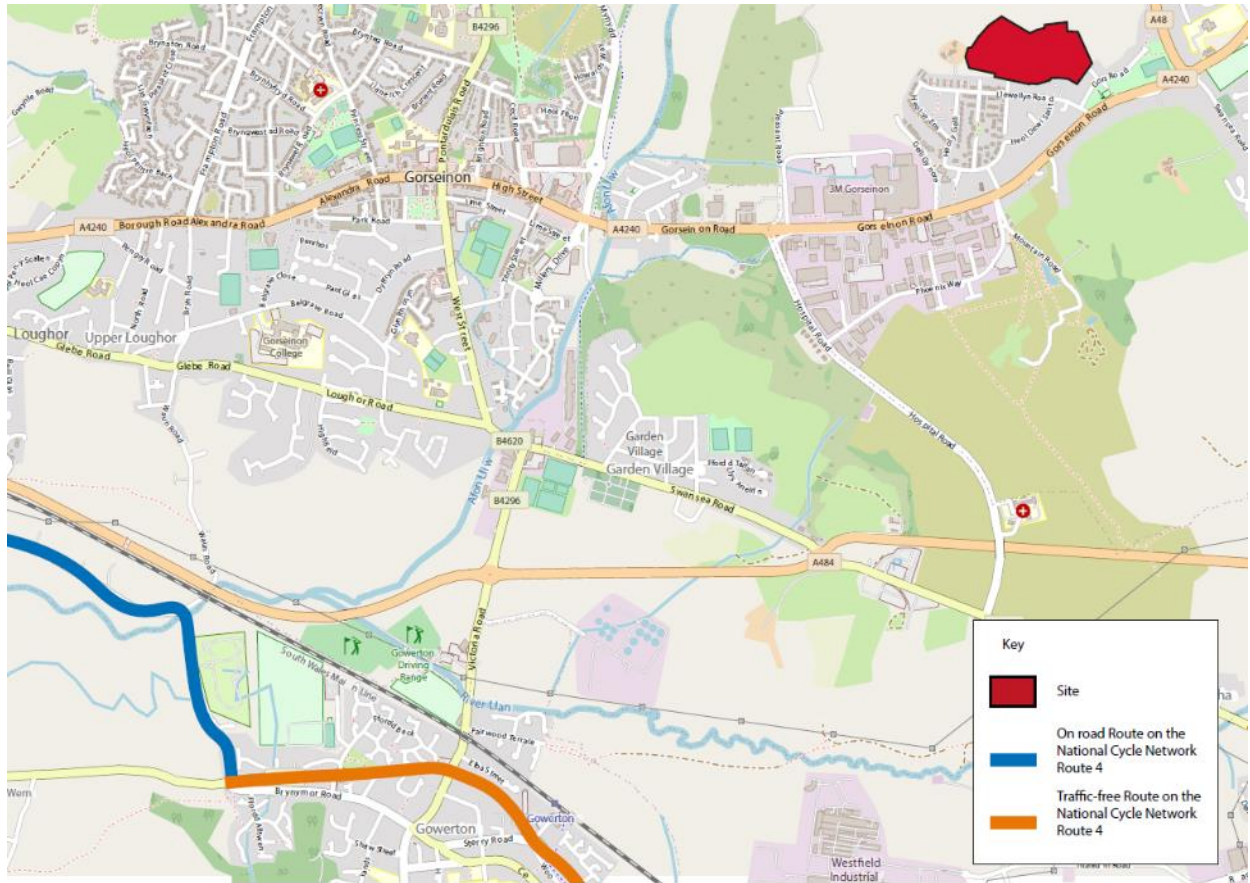
- 2.25 As shown in **Figure 2.5**, there is an advisory route via Gorseinon Road, to the west and south of the site, which provides a cycle link to Gorseinon. Within Gorseinon there are multiple advisory routes and an Active Travel route that connects Gorseinon to Penyrheol to the north and Kingsbridge to the south.
- 2.26 To the south of the site, the emerging Parc Mawr, Penllergaer development includes a new north south active travel connection linking A4240 Gorseinon Road with the A484. Whilst the site is not reliant on the delivery of this connection, upon opening it was further enhance local active travel connections for the site. The alignment of this route is shown in **Figure 2.6**.

Figure 2.6 – Parc Mawr, Penllergaer – Access & Movement Parameter Plan Extract



2.27 Sustrans National Cycle Network (NCN) Route 4 is located approximately 3.2 km south west of the site. NCN Route 4 is a long-distance route that connects London to Fishguard in West Wales. The route in relation to the site is shown in **Figure 2.7**.

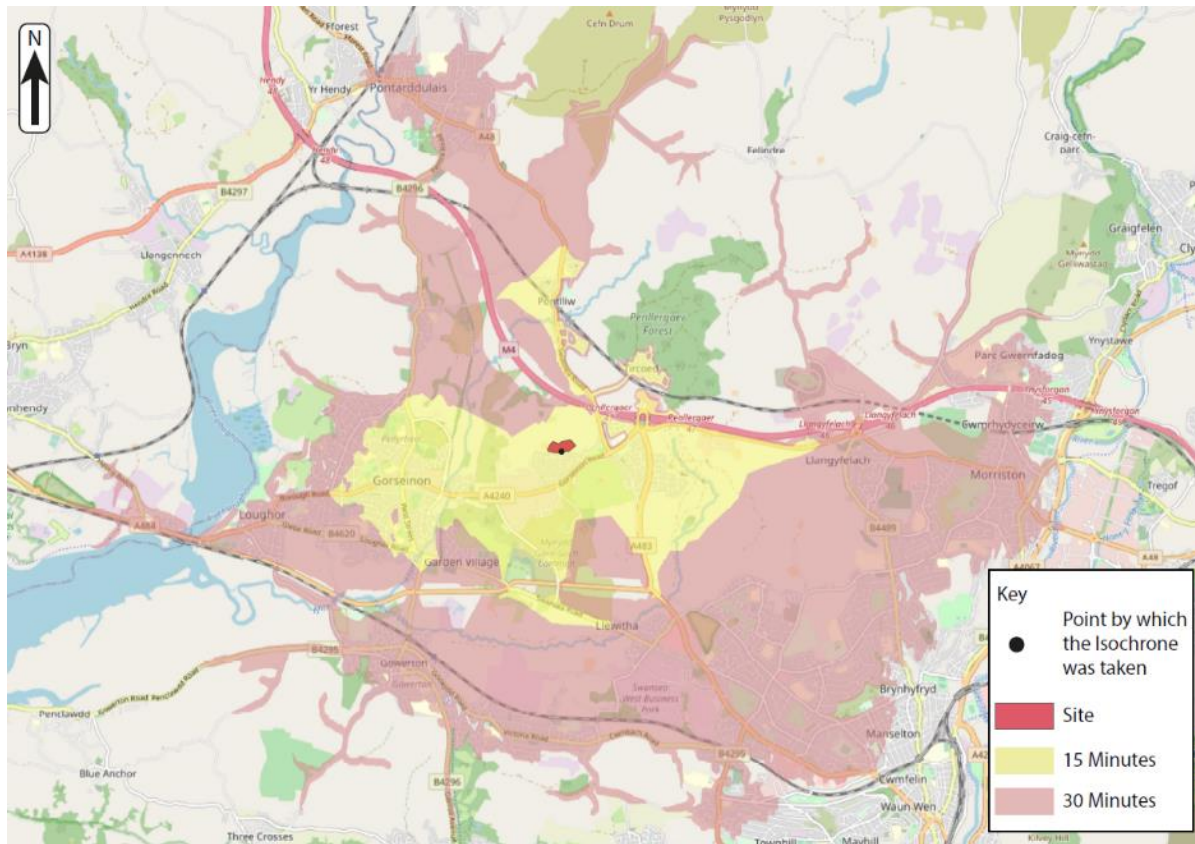
Figure 2.7 – National Cycle Network Route within the vicinity of the site



2.28 As illustrated above, there are many opportunities in the local area to enable residents to cycle to work and also for shopping and leisure purposes. Importantly, cycling can be used as part of a multi-modal journey, i.e. cycling to Gowerton railway station which provides onward connectivity to a range of destinations.

2.29 **Figure 2.7** indicates the cycling isochrones of 15 and 30 minutes from the site access point, assuming a comfortable average cycle speed of 15 km/hr (9 mph). Sustrans has suggested that up to 5 miles is an appropriate distance for cycle commuting. This equates to 33 minutes at this speed. There are significant areas within cycling distance of the site, providing opportunities to access employment, leisure and retail destinations by bicycle.

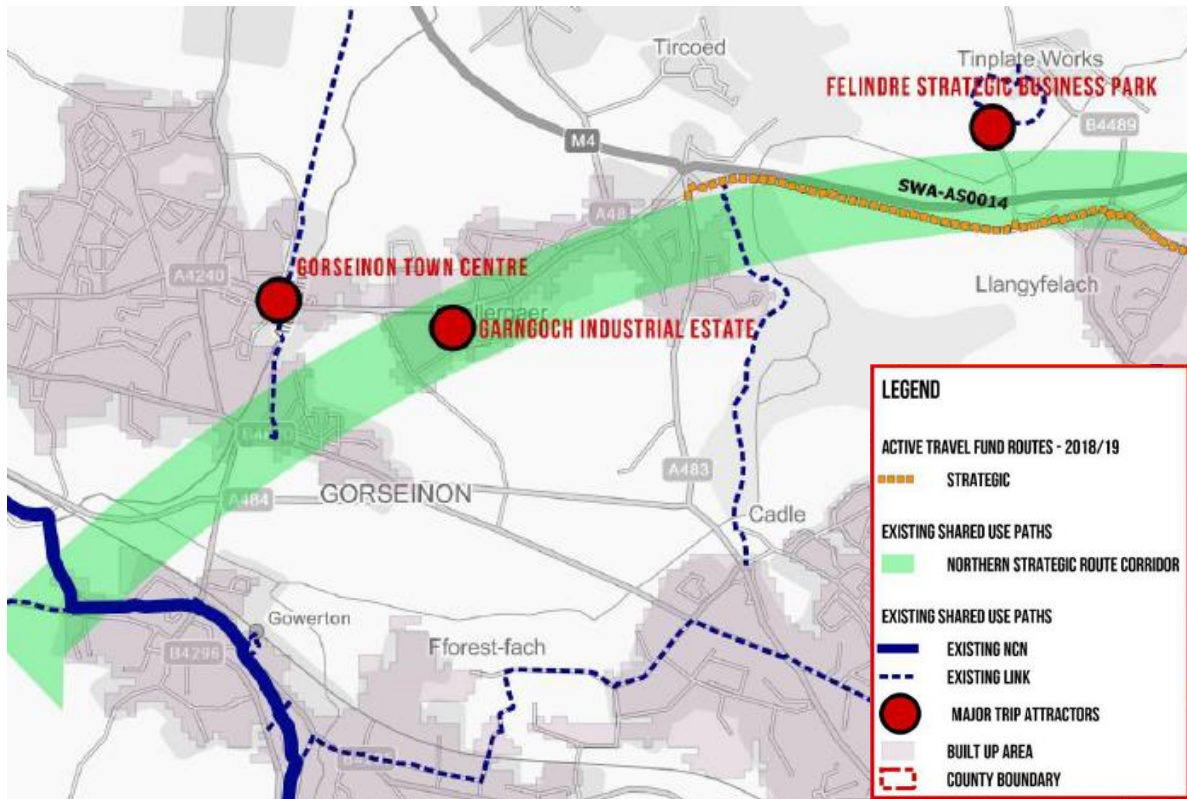
Figure 2.8 – The 15 and 30 Minute indicative cycling isochrones



Swansea Integrated Network

- 2.30 SC are currently part way through implementation of their network of integrated routes in accordance with the Active Travel Wales Act 2013.
- 2.31 To the east of the site, a section of route between M4 Junction 47 and Morryston has been completed providing a segregated cycle route adjacent to the A48.
- 2.32 To the west of the site, SC are currently implementing a section of route between Kingsbridge and Gowerton Station, providing improved connectivity between these areas.
- 2.33 As part of the pre application discussions, a meeting was held with SC's Network Planning team. They advised that a scheme is being developed by the council to provide a segregated cycle route adjacent to the A4240 between Gorseinon and Penllergaer Interchange. From the site access, this route will be located approximately 400 m away, accessed via Llewellyn Road.
- 2.34 The strategic corridor being considered is illustrated in the extract provided in **Figure 2.9**, while a copy of the full plan is provided in **Appendix B**.

Figure 2.9 – Swansea Council Integrated Network – Strategic Corridor



Bus

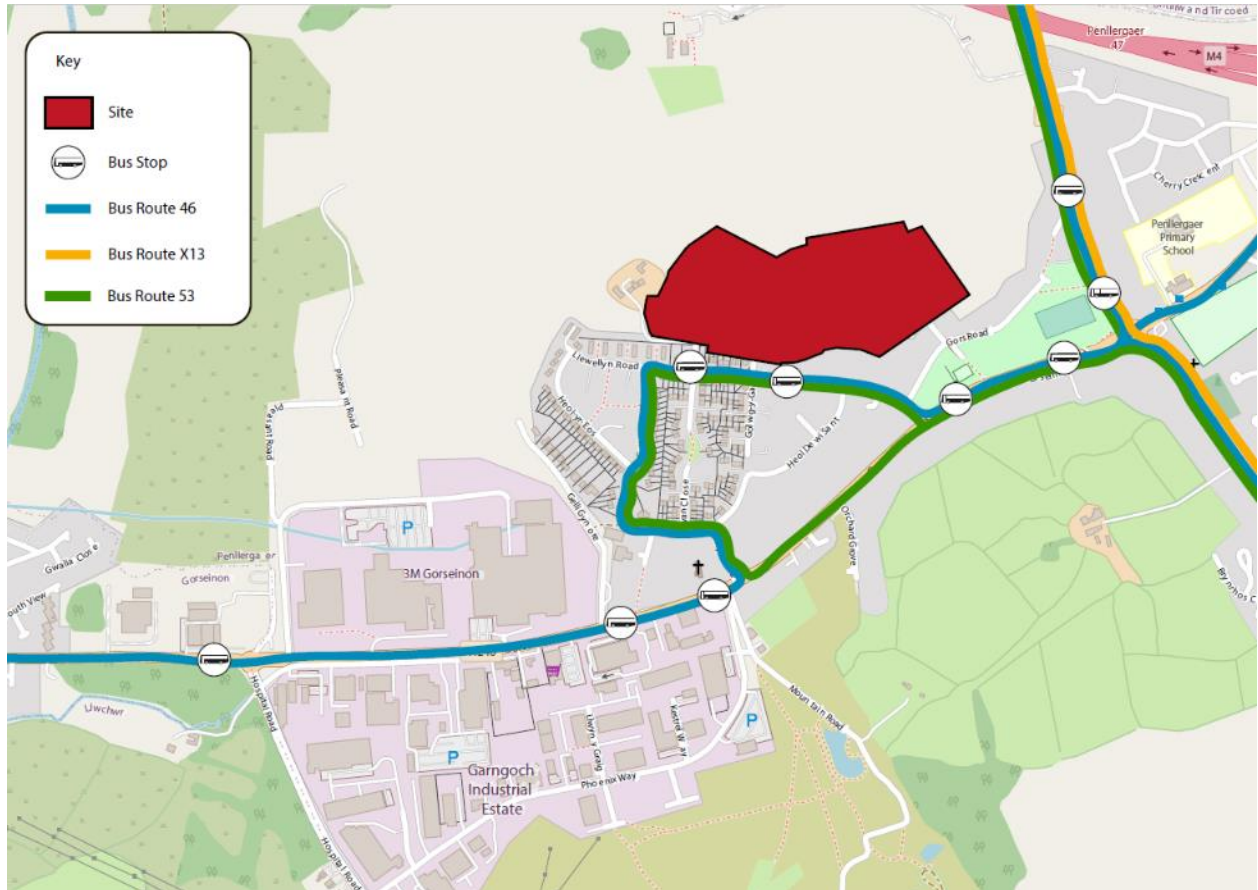
2.35 In light of the coronavirus pandemic, the timetables of local bus services in Swansea have been altered to reflect the changing government advice and demand. Therefore, the bus timetables are not representative of typical frequencies prior to the pandemic. A summary of local bus stops and services are provided in **Table 2.3**.

Table 2.3 – Local Bus Services

Stop	Routes	Frequency
Morgan Close	46 (Gorseinon – Penllergaer – Morrision)	Hourly (first bus: 07:55 - last bus 18:20) Four times a day
Heol Dewi Sant	53 (Penllergaer – Fforestfach – Cockett – Sketty – Swansea)	
Gors Road	X13 (Swansea – Tircoed – Pontarddulais – Llandeilo)	Hourly (first bus: 06:00- last bus 18:05)
	46 (Gorseinon – Penllergaer – Morrision)	Hourly (first bus: 07:55 - last bus 18:20)
	53 (Penllergaer – Fforestfach – Cockett – Sketty – Swansea)	Four times a day

2.36 The nearest bus stops are located on Llewellyn Road to the immediate south of the site and others on Swansea Road, located further east of the site. The location of these bus stops in the vicinity of the site, and the bus routes that serve them, are shown in **Figure 2.10**.

Figure 2.10 – Bus Routes and Bus Stops Plan



2.37 The site is located close to three existing bus stops at Morgan Road, Heol Dewi Sant and the Playing Fields (A4240). The Morgan Road bus stop is the closest of the three stops and is located an approximate 2 minute walk from the site entrance on Mount Crescent.

2.38 There are three major bus services within the vicinity of the site, the 46 bus, which connects Morryston to Gorseinon, the 53 which routes between Penllergaer and Swansea and the X13 which connects Swansea to Ammanford via Pontardulais.

Rail

2.39 The nearest railway station to the site is Gowerton station which is located approximately five km south of the site and offers direct connections to major towns and cities, as shown in **Table 2.4**.

Table 2.4 – Rail Services from Gowerton Station

Destination	Journey time (mins)	Frequency (mins)
Llanelli	7	60
Swansea	15	60
Cardiff Central	80	60
Newport	90	60
Milford Haven	100	120
Gloucester	180	60
Manchester Piccadilly	280	360

- 2.40 Gowerton station has 23 car parking spaces and facilities for five bicycles, secured by CCTV. This enables multi-modal journeys, particularly as part of a regular commute.
- 2.41 The Covid-19 Pandemic has impacted rail travel, and as a result, the current timetables are not necessarily representative of the true extent of connections that were offered at Gowerton station pre-Covid-19 and what may be available once normal operating arrangements are reintroduced.

Local Highway Network

Llewellyn Road

- 2.42 Llewellyn Road is a two-way single carriageway that runs directly south of the site on the existing northern boundary of the village of Penllergaer. It is subject to a 30 mph speed limit and traffic calming measures are present, including priority narrowing and speed cushions. Llewellyn Road provides the most direct link from the site to the A4240 Gorseinon Road.

Mount Crescent

- 2.43 Mount Crescent also links Llewellyn Road to the A4240 Gorseinon Road via Dilwyn Road. Mount Crescent is a two-way single carriageway that is subject to a 30mph speed limit. There are footways on both sides of the road and street lighting along the whole Crescent. The Crescent is mainly residential and additional residential access roads are also present along it.

A4240 Gorseinon Road

- 2.44 The A4240 routes to the south east of the site. The road is a two-way single carriageway and is subject to a 30 mph speed limit and features both informal and formal pedestrian crossings, with pedestrian refuge islands, Toucan crossings and right turn ghost islands along the road. The A4240 benefits from well-lit and well-maintained footways on both sides.

Strategic Highway Network

A48

2.45 In the context of the site, the A48 runs north, perpendicular to the A4240 up into Pontlliw. It is a two-way single carriageway and is subject to a 40 mph speed limit which reduces to 30mph as it routes through the village of Pontlliw.

A483

2.46 The A483 is located approximately 1km east of the site and routes on a north south alignment between M4 Junction 47 and Swansea city centre via Fforest-fach, Gendros and Cwmbwrla.

M4

2.47 Junction 47 of the M4 is located to the north east of the site and as a motorway, is subject to the national speed limit. The M4 runs from London to South West Wales and therefore connects the site to Cardiff, Newport, Bristol, Swindon, Reading and London.

Traffic Survey

2.48 Traffic surveys have been undertaken covering the following junctions:

- Classified Turning Counts (CTCs):
 - Mount Crescent / Llewellyn Road
 - Llewellyn Road / A4240 Gorseinon Road
- Automatic Traffic Counts (ATCs):
 - Llewellyn Road
 - A4240 Gorseinon Road

2.49 The ATC on Llewellyn Road recorded a 7 day, 24 hour average traffic volume of 536 vehicles in the eastbound direction and 442 vehicles in the westbound direction. The recorded 85th percentile speeds were 24.4 mph eastbound and 22.5 mph westbound over the same time period. Speeds in both directions were considerably lower than the signed 30 mph speed limit.

Personal Injury Collision Data

Overview

2.50 Personal Injury Collision (PIC) data has been obtained from Welsh Government for the local highway network.

- 2.51 In order to determine if any recent collisions have occurred on the highway network, collision data has been obtained for the most recently available five-year period up until November 2020. The data obtained includes collisions recorded on the A4240 in the vicinity of the site.
- 2.52 Collisions recorded are ranked in order of severity, with the levels being 'slight', 'serious' and 'fatal'.
- 2.53 A copy of the PIC data is provided in **Appendix C**.

PIC Review

- 2.54 A total of two collisions occurred within the vicinity of the site in the latest five-year period (2015-2020), both of which were classified as 'slight' severity. Both collisions took place on the Gorseinon Road (A4240) / Swansea Road / A48 roundabout. Our analysis has not identified any existing highway safety issues or trends which could be exacerbated by the proposed development.

3 Policy Review

Overview

- 3.1 The policy context for the proposed development is set out in both national and local planning policy and guidance.

National

Planning Policy Wales (Edition 11, February 2021)

- 3.2 Planning Policy Wales Edition 11 (PPW) sets out the land use planning policies of the Welsh Government.
- 3.3 With regards to sustainable transport, PPW advises that, in the context of active and social places, developments should encourage modal shift and be easily accessible by walking, cycling and public transport, by virtue of their location, design and provision of on and off-site sustainable transport infrastructure.
- 3.4 Furthermore, the 'active and social' theme within PPW aims to ensure new development is located and designed in a way which minimises the need to travel, reduces dependency on the private car and enables sustainable access to employment, local services and community facilities.
- 3.5 A key theme throughout PPW is the aim of reducing reliance on travel by private car, and the adverse impacts of motorised transport on the environment and people's health, by prioritising and increasing active travel and public transport. Additionally, it states that development proposals must seek to maximise accessibility by walking, cycling and public transport, by prioritising the provision of appropriate on-site infrastructure and, where necessary, mitigating transport impacts through the provision of off-site measures, such as the development of active travel routes, bus priority infrastructure and financial support for public transport services.
- 3.6 These themes of emphasis on sustainable transport and active travel are supported by the 'Sustainable Transport Hierarchy for Planning' included within PPW.

Technical Advice Note: 18

- 3.7 The Technical Advice Note (TAN) 18 elaborates on the relationship between land use planning and transport infrastructure by outlining a range of key accessibility principles that should inform future patterns of development.
- 3.8 In the case of new residential development, sites that are accessible to jobs, shops, and services by modes other than car and are afforded sufficient capacity on public transport services are favoured.
- 3.9 TAN 18 advises that development plans should afford priority to the following:
- i) Promote housing development at locations with good access by walking and cycling to primary and secondary schools and public transport stops, and by all modes to employment,

further and higher education, services, shopping and leisure, or where such access will be provided as part of the scheme or is a firm proposal in the Regional Travel Plan;

- ii) Ensure that significant new housing schemes contain ancillary uses including local shops, and services and, where appropriate, local employment.
- iii) Include policies and standards on densities, and parking to achieve higher residential densities in places with good public transport accessibility and capacity.
- iv) Encourage residential layouts that incorporate traffic management proposals such as home zones, calming measures and 20 mph zones and where appropriate, layouts that allow public transport to pass through easily.
- v) Require layouts and densities, which maximise the opportunity for residents to walk and cycle to local facilities, and public transport stops.

Placemaking Wales – Placemaking Guide 2020 (Guidance)

3.10 The Placemaking Guide outlines the importance of the following principles in placemaking:

- **“People and Community** - *The local community are involved in the development of proposals. The needs, aspirations, health and well-being of all people are considered at the outset. Proposals are shaped to help to meet these needs as well as create, integrate, protect and/or enhance a sense of community and promote equality.*
- **Location** - *Places grow and develop in a way that uses land efficiently, supports and enhances existing places and is well connected. The location of housing, employment, leisure and other facilities are planned to help reduce the need to travel.*
- **Movement** - *Walking, cycling and public transport are prioritised to provide a choice of transport modes and avoid dependence on private vehicles. Well designed and safe active travel routes connect to the wider active travel and public transport network, and public transport stations and stops are positively integrated.*
- **Mix of Uses** - *Places have a range of purposes which provide opportunities for community development, local business growth and access to jobs, services and facilities via walking, cycling or public transport. Development density and a mix of uses and tenures helps to support a diverse community and vibrant public realm.*
- **Public Realm** – *streets and public spaces are well defined, welcoming, safe and inclusive with a distinct identity. They are designed to be robust and adaptable with landscape, green infrastructure and sustainable drainage well integrated. They are well connected to existing places and promote opportunities for social interaction and a range of activities for all people.*

Placemaking
Guide
2020



- **Identity** - the positive, distinctive qualities of existing places are valued and respected. The unique features and opportunities of a location, including heritage, culture, language, built and natural physical attributes, are identified and responded to.

Well-being of Future Generations (Wales) Act 2015

- 3.11 Wales faces a number of challenges now and in the future, such as climate change, poverty, health inequalities and jobs and growth. The Well-being of Future Generations Act puts in place seven well-being goals that will help to tackle these challenges. The Act makes it clear the listed public bodies must work to achieve all of the goals, not just one or two. They are:
- A prosperous Wales;
 - A resilient Wales;
 - A more Equal Wales;
 - A healthier Wales;
 - A Wales of cohesive communities;
 - A Wales of Vibrant Culture and thriving Welsh language; and
 - A globally responsible Wales.
- 3.12 The Well-being of future generations Act defines “sustainable development” as the process of improving the economic, social, environmental and cultural well-being of Wales by taking action, in accordance with the sustainable development principle, aimed at achieving the wellbeing goals.
- 3.13 A major theme within the Well-being of Future Generations Act is Climate Change, and therefore the act promotes an:
- “innovative, productive and low carbon society which recognises the limits of the global environment and therefore uses resources efficiently and proportionately”;
 - “A nation which maintains and enhances a biodiverse natural environment with healthy functioning ecosystems”; and
 - “A nation which, when doing anything to improve the economic, social, environmental and cultural well-being of Wales, takes account of whether doing such a thing may make a positive contribution to global well-being.”

Future Wales: The National Plan 2040 (February 2021)

- 3.14 The document is a National Development Framework for Wales. It influences all levels of the planning system in Wales and will help to shape Strategic and Local Development Plans prepared by councils and national park authorities.
- 3.15 One of the main challenges facing Wales is climate change. The document highlights the importance of reducing emissions to protect well-being and to demonstrate global responsibility. The planning system needs to focus on delivering a decarbonised and resilient Wales through the places that are created, the energy generated and the natural resources and materials that are used and how people live and travel.
- 3.16 There has been a significant change in the way people live and travel as a result of the COVID-19 pandemic. The pandemic has highlighted the quality and accessibility of people's local areas as being important for people's health and well-being during the pandemic. There has been a collective appreciation in Wales for the value of parks and green spaces, walking and cycling routes, local shops and amenities and cleaner air as a result of reduced vehicle movements on the network. Due to a change in people's working patterns, good broadband and telecommunication connections are now essential to enable people to work from home, access services and to stay in touch with each other virtually.
- 3.17 Welsh Government have produced a document called 'COVID-19 Reconstructions: Challenges and Priorities'. This document sets out how people are using places differently, travelling less and spending more time working from home. Welsh Government is encouraging an increase in remote working and has set a long-term ambition for 30% of the Welsh workforce to work away from a traditional office. This is intended to help town centres, reduce congestion and cut carbon emissions. The planning system must therefore respond to these changes and contribute to a sustainable recovery, shaping places around a vision for healthy and resilient places.
- 3.18 The Welsh Government will work with Transport for Wales, local authorities, operators and partners to deliver the following:
- Active Travel – Prioritising walking and cycling for all local travel;
 - Bus – improve the legislative framework for how local bus services are planned and delivered. Invest in the development of integrated regional and local bus networks to increase modal share of bus travel and improve access by bus to a wider range of trip destinations;
 - Metro – Develop the South East Metro, South West Metro and North Wales Metro and create new integrated transport systems that provide faster, more frequent and joined up services using trains, buses and light rail; and

- Ultra-low Emission Vehicles – Support the roll-out of suitable fuelling infrastructure to facilitate the adoption of ultra-low emission vehicles, particularly in rural areas.

Llwybr Newydd - A New Wales Transport Strategy (Consultation Draft 2020)

- 3.19 This document is a draft strategy for the future of transport in Wales and sets out the ambitions for the next 20 years and Welsh Government's priorities for the next 5 years. Consultation on the draft strategy ended on 25th January 2021.
- 3.20 The strategy has key ambitions for Welsh communities, Environment, Economy Culture and language and sets out 5 key transport priorities:
- Priority 1: reduce greenhouse gas emissions by planning ahead for better physical and digital connectivity, more local services, more home and remote working and more active travel, so that fewer people need to use their cars on a daily basis;
 - Priority 2: grow public transport use in Wales by providing services that everyone can use, wants to use, and does use, based on;
 - Priority 3: safe, accessible, well-maintained and managed transport infrastructure that is also future-proofed to support public transport and electrification especially walking and cycling;
 - Priority 4: making sustainable transport choices more attractive and affordable to more people and businesses, whilst respecting the fact that many people including those in rural areas or disabled people, may not have options; and
 - Priority 5: supporting innovations that help more people and businesses adopt more sustainable transport choices.
- 3.21 The document has been drafted in the context of the COVID-19 pandemic and therefore sets out the long-term direction for transport in Wales but also recognises the need to continue to respond to a plan for the immediate impacts of COVID-19 on transport and on people's lives.
- 3.22 The long-term ambition for the strategy is for a transport system that contributes to a more equal and a healthier Wales and ensure that there are fewer physical, economic, social and attitudinal barriers that prevent people from walking, cycling or using public transport.

Manual for Streets (Guidance)

- 3.23 Manual for Streets supports reducing people's reliance on the private car;

“By creating linkages between new housing and local facilities and community infrastructure, the public transport network and established walking and cycling routes are fundamental to achieving more sustainable patterns of movements and to reducing people’s reliance on the car.”

3.24 The site is ideally placed to encourage more sustainable patterns of movements.

Active Travel Wales Act 2013

3.25 The Active Travel (Wales) Act 2013 places a requirement on local authorities to continuously improve facilities and routes for pedestrians and cyclists and to prepare maps identifying current and potential routes for their use.

3.26 Whilst the Act does not place any responsibility on new development, it does demonstrate the necessary direction of transport policy, and the proposed developments’ promotion of walking and cycling as key modes of travel accords with this.

3.27 The Welsh Government seeks to enable more people to walk, cycle and generally travel by more active methods, so that:

- i) More people can experience the health benefits of active travel;
- ii) We reduce our greenhouse gas emissions;
- iii) We help address poverty and disadvantage; and
- iv) We help our economy grow by unlocking sustainable economic growth.

Joint Transport Plan for South West Wales 2015-2020

3.28 The Joint Transport Plan for South West Wales 2015-2020 replaced the Regional Transport Plan at the beginning of 2015, it covers four Local Authorities in South West Wales including the City and County of Swansea.

3.29 The overarching vision of the Local Transport Plan is; ‘to improve transport and access within and beyond the region to facilitate economic regeneration, reduce deprivation and support the development and use of more sustainable and healthier modes of transport’.

3.30 The relevant objectives set out by this document include:

- i) To improve the efficiency and reliability of the movement of people... within and beyond South West Wales to support economic growth in the City Region;
- ii) To improve access for all to a wide range of services and facilities including employment and business, education and training, health care, tourism and leisure activities;

- iii) To improve the sustainability of transport by improving the range and quality of, and awareness about, transport options, including those which improve health and wellbeing;
- iv) To improve integration between policies, service provision and modes of transport in South West Wales;
- v) To implement measures which will protect and enhance the natural and built environment and reduce the adverse impact of transport on health and climate change; and;
- vi) To improve road safety and personal security in South West Wales.

Local

Swansea Local Development Plan 2010-2025: Adopted February 2019

- 3.31 Policy T2 of the Local Development Plan (LDP) relates to Active Travel. The policy states that developments must take opportunities to enhance walking and cycling access by “incorporating within the site, and/or making financial contributions towards the delivery off-site of, the following measures as appropriate;
- i) “Permeable, legible, direct, convenient, attractive and safe walking and cycling routes that connect the proposed development to: surrounding settlements; public transport nodes; community facilities; commercial and employment areas; tourism facilities; and leisure opportunities;
 - ii) Improvements, connections, and/or extensions to: existing PROWs (particularly bridleways); the Wales Coastal Path; the Cycle Swansea Bay routes; National Cycle Network Routes 4 and 43; Safe Routes to School; shared use paths; and routes forming part of the Green Infrastructure network;
 - iii) The delivery of infrastructure designed in accordance with standards of good practice; and;
 - iv) Facilities that encourage the uptake of walking and cycling, including but not limited to appropriate signage; secure and convenient cycle parking; and changing and shower facilities.”

City and County of Swansea Parking Standards

Car Parking

- 3.32 The CCS parking standards are set out within the ‘Supplementary Planning Guidance (SPG)’ titled, “City and County of Swansea Parking Standards, March 2012”. These are maximum standards.
- 3.33 The SPG states:
- i) “For developments where clear evidence has been supplied that car ownership levels will be lower than normal, a more flexible approach to numbers of parking spaces may be taken.

Acceptable evidence of this would be a contractual arrangement with tenants to secure low car ownership levels”.

Summary

- 3.34 The site is located within the settlement boundary of Penllergaer, adjacent to an existing residential area. Penllergaer includes a range of local facilities including retail and leisure opportunities. Penllergaer Primary School is located a reasonable walking distance from the site, while buses serve Llewellyn Road at several bus stops.
- 3.35 The site is located in an area accessible by a range of transport modes, while SC are currently implementing a series of segregated cycle routes in the area including the development of a segregated route adjacent to A4240 Gorseinon Road. These improvements will further enhance the accessibility of the site.
- 3.36 The site and proposed residential development therefore accords with the national and local transport policy objectives.

4 Development Proposals

Overview

- 4.1 The proposed development comprises a residential scheme for 180 dwellings, new site access, parking, and associated landscaping. The proposed development contains 20 less dwellings than the development SC previously resolved to grant consent for (200 dwellings, Ref: 20110345) on this site.
- 4.2 The internal road is proposed to be subject to a 20mph signed speed limit and has been designed to Manual for Streets (MfS) and placemaking principles to encourage active travel use, maximise social inclusion and minimise the effect of the private car.

Site Layout

- 4.3 The proposed development layout is illustrated in **Figure 4.1** and provided at a larger scale in **Appendix D**.

Figure 4.1 – Proposed Development Layout



Placemaking

- 4.4 The proposed development layout has been developed to accord with the principles of placemaking as set out within the Future Wales Act. The site includes a range of leisure routes including around the periphery of the site which will support movements by active travel for all ages.
- 4.5 The location of the site will positively integrate with the settlement of Penllergaer and existing transport infrastructure such as bus stops and SC's evolving active travel (Integrated Network). The site is located in an area with a broad range of local facilities including opportunities for local employment.

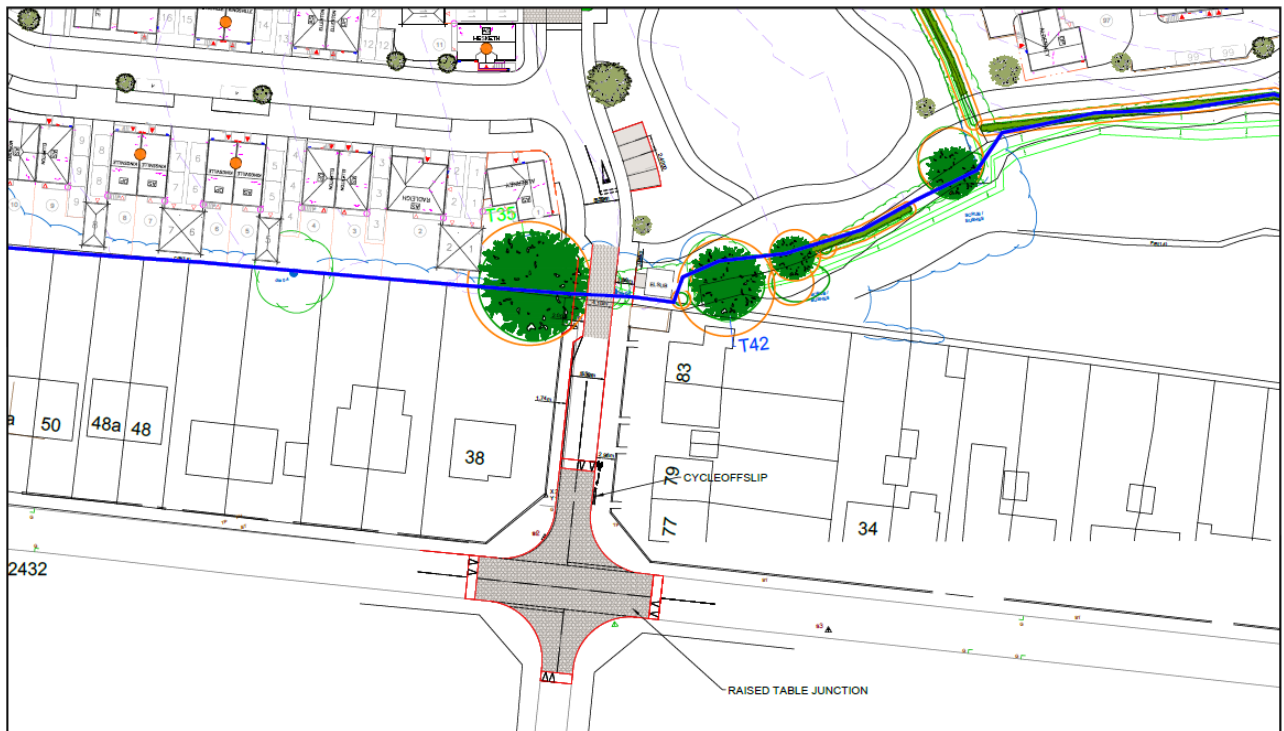
Pedestrian & Cycle Access

- 4.6 Pedestrian and cycle access is provided to site via the site access with Mount Crescent. The existing footways on Mount Crescent will be extended into the site. Cyclists are able to access the site via the carriageway of Mount Crescent or a shared foot / cycleway located on the eastern side of Mount Crescent and the internal road network within the site.

Vehicular Access

- 4.7 Vehicle access is proposed into the site from Mount Crescent. This access accounts for the existing Category A tree located within the site. It is proposed that a limited section of narrower carriageway is provided adjacent to the tree to minimise the road construction impact on the root protection zone of the tree. The priority narrowing provides priority to one direction of traffic, however at 4.1 m wide it is sufficiently wide enough to allow two cars to safely pass each other. This access is similar to the access that SC previously consented for the site.
- 4.8 The junction of Mount Crescent with Llewellyn Road has been reviewed and a junction visibility splay of 2.4m by 40 m has been demonstrated in line with MfS principles. The site access and proposed Raised Table are shown in **Figure 4.2**.

Figure 4.2 – Site Access and Raised Table Junction



4.9 The junction of Mount Crescent with Llewellyn Road is proposed to be upgraded to provide a Raised Table/Plateau, a design of which is provided in **Vectos Drawing 205631_A05**, a copy of which is provided in **Appendix E**.

Stage One Road Safety Audit

4.10 The site access has been subject to a Stage One Road Safety Audit (RSA). A site visit was undertaken by the Audit Team on Thursday 27th November 2021 between the hours of 12:00 – 13:00.

4.11 The RSA identified an issue with the location of the southbound stop line at the site entrance. Following this the stop line was shifted back slightly to provide more space for an HGV to enter the site while a vehicle waits to leave the site. A copy of the RSA and Designers Response are provided in **Appendix F**.

Vehicle Parking

4.12 Car parking will be provided in line with guidance in the SC’s Supplementary Planning Guidance: Parking Standards (2012). The site is located within Zone 4 (Suburban or Near Urban) of Swansea’s Parking standards.

4.13 The residential parking standards for Zones 2-6 are shown in **Table 4.1**.

Table 4.1 – Swansea Residential Parking Standards (March, 2012) – Zones 2 to 6

Type of Development	Maximum Requirements	
	Residents	Visitors
General Purpose Houses and Apartments	1 space per bedroom (Max three spaces)	1 space per 5 units

4.14 Parking across the site is provided through a mixture of on plot parking, garages and 28 visitor spaces. The allocation of spaces is shown in the Car Parking Strategy Plan, a copy of which is provided in **Appendix D**. The breakdown of spaces is shown in **Table 4.2**.

Table 4.2 – Residential Parking Summary

Spaces per Dwelling	Dwellings	Total Spaces
1	4	4
2	145	290
3	31	93
	180	387
Visitor	-	28
Total	-	415

4.15 The opportunity to accommodate four dedicated spaces within the site to compensate for existing dwellings on Mount Road has been incorporated into the masterplan, with four spaces located on the eastern side of the site access road to the north of the priority narrowing.

Delivery and Servicing

4.16 The proposed development layout has been reviewed with respect to delivery and servicing arrangements. A refuse collection vehicle is able to enter the site and access the various dwellings across the site in accordance with MfS principles.

4.17 Copies of the swept path analysis are provided in **Appendix E**.

5 Trip Generation

Overview

- 5.1 This section outlines the anticipated level of trip generation for the site. It has been undertaken on the basis of 200 units to align with the previously proposed development’s resolution to grant from SC and the current commitment in the SC LDP. However, the currently proposed development includes only 180 units and therefore the following assessment provides a level of robustness.
- 5.2 The approach to trip generation was set out through the Pre App scoping exercise and aligns with that set out in the Parc Mawr, Penllergaer scheme (Ref: 2018_2697-OUT) development.

Trip Rates

- 5.3 The Person trip rates obtained from the Parc Mawr, Penllergaer scheme are set out in **Table 5.1**, while a copy of the corresponding TRICS output is provided in **Appendix G**.
- 5.4 The selection criteria were as follows:
- Land Use : 03 - RESIDENTIAL
 - Category : M - MIXED PRIVATE/AFFORDABLE HOUSING
 - Type: MULTI-MODAL VEHICLES
- 5.5 The peak period residential person trip rates are provided in **Table 5.1**.

Table 5.1 - Person Trip Rates (per dwelling)

Period	Time	Arrivals	Departures	Total
AM Peak hour	07:00 - 08:00	0.096	0.401	0.497
	08:00 - 09:00	0.171	0.736	0.907
	09:00 - 10:00	0.195	0.257	0.452
PM Peak Hour	16:00 - 17:00	0.419	0.244	0.663
	17:00 - 18:00	0.491	0.233	0.724
	18:00 - 19:00	0.408	0.221	0.629

- 5.6 The resulting Person movements based on 200 dwellings is provided in **Table 5.2**.

Table 5.2 - Total Person Movements (200 dwellings)

Period	Time	Arrivals	Departures	Total
AM Peak hour	07:00 - 08:00	19	80	99
	08:00 - 09:00	34	147	181
	09:00 - 10:00	39	51	90
PM Peak Hour	16:00 - 17:00	84	49	133
	17:00 - 18:00	98	47	145
	18:00 - 19:00	82	44	126

5.7 To quantify the types of movements being made, the National Travel Survey (NTS) Journey purposes have been used. The movements set out in **Table 5.2** have been applied to the categories provided in NTS Table 502 'Trip start time by trip purpose (Monday to Friday only)'. NTS Table 502 has been replicated in **Table 5.3** for the AM (07:00 – 10:00) and PM (16:00 – 19:00) peak periods.

Table 5.3 - NTS Table 502 - Journey Purpose (Peak Periods)

Start time	Commute	Business	Education	Escort education	Shopping	Other work, other escort and personal business	Visiting friends / entertainment / sport	Holiday / Day trip / Other	All
0700 - 0759	48%	6%	14%	5%	3%	14%	4%	6%	100%
0800 - 0859	20%	3%	29%	23%	4%	14%	3%	4%	100%
0900 - 0959	11%	5%	3%	7%	22%	26%	15%	12%	100%
1600 - 1659	5%	4%	2%	2%	35%	23%	18%	11%	100%
1700 - 1759	7%	4%	2%	2%	30%	25%	20%	9%	100%
1800 - 1859	10%	5%	2%	1%	28%	24%	19%	10%	100%

5.8 The resulting Person movements based on the journey purposes detailed in **Table 5.3** are shown in **Table 5.4**.

Table 5.4 - NTS Table 502 - Peak hours Movements

Start Time	Direction	Commuting	Business	Education	Escort education	Shopping	Other work, other escort and personal business	Visiting friends / entertainment / sport	Holiday / Day trip / Other	All purposes
0700 - 0759	Arrive	9	1	3	1	1	3	1	1	19
	Depart	38	4	11	4	2	11	3	5	80
0800 - 0859	Arrive	7	1	10	8	1	5	1	1	34
	Depart	29	5	42	34	6	21	5	6	147
0900 - 0959	Arrive	4	2	1	3	9	10	6	4	39
	Depart	6	3	2	4	11	13	8	6	51
1600 - 1659	Arrive	4	3	2	1	29	20	15	9	84
	Depart	2	2	1	1	17	11	9	5	49
1700 - 1759	Arrive	7	4	2	2	30	24	20	9	98
	Depart	3	2	1	1	14	12	9	4	47
1800 - 1859	Arrive	8	4	2	1	23	20	16	9	82
	Depart	4	2	1	0	13	11	8	5	44

5.9 The application of the ‘Commuting’ and ‘Business’ person movements has been made to the 2011 Census Mode Share for journeys to work from MSOA 004 (in which the site is located). The resulting multi modal movements are provided in **Table 5.5** for the AM and PM peak periods.

Table 5.5 - Commuting and Business Movements by Mode share (2011 Census)

Mode	Swansea 004 (MSOA) Sample	Percentage	0700 - 0759		0800 - 0859		0900 - 0959		1600 - 1659		1700 - 1759		1800 - 1859	
			Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart
Underground, metro, light rail, tram	2	0.1%	0	0	0	0	0	0	0	0	0	0	0	0
Train	15	0.4%	0	0	0	0	0	0	0	0	0	0	0	0
Bus, minibus or coach	116	3.3%	0	1	0	1	0	0	0	0	0	0	0	0
Taxi	12	0.3%	0	0	0	0	0	0	0	0	0	0	0	0
Motorcycle, scooter or moped	24	0.7%	0	0	0	0	0	0	0	0	0	0	0	0
Driving a car or van	3,000	84.8%	9	36	7	29	5	7	6	4	9	4	10	5
Passenger in a car or van	191	5.4%	1	2	0	2	0	0	0	0	1	0	1	0
Bicycle	15	0.4%	0	0	0	0	0	0	0	0	0	0	0	0
On foot	157	4.4%	0	2	0	1	0	0	0	0	0	0	1	0
Other method of travel to work	6	0.2%	0	0	0	0	0	0	0	0	0	0	0	0
Total	3,538	100%	10	43	8	34	6	8	8	4	11	5	12	6

- 5.10 The majority of business and commuting trips are predicted to be undertaken through driving a car or van, with 36 two-way vehicle movements between 08:00 and 09:00 and 13 two-way vehicle movements between 17:00 and 18:00.
- 5.11 To provide mode share splits for the other journey purposes, NTS Table 409 has been used which provides the 'Average number of trips (trip rates) by purpose and main mode'. Application of these mode share percentages has been applied to the remaining journey purpose categories as set out in **Table 5.4**. NTS Table 409a is replicated in **Table 5.6**, while a grouping together of similar modes has been undertaken in a consolidated version in **Table 5.7**.

Table 5.6 - NTS Table 409a

Purpose	Walk	Bicycle	Car / van driver	Car / van passenger	Motorcycle	Other private transport	Bus in London	Other local bus	Non-local bus	London Underground	Surface rail	Taxi / minicab	Other public transport	All modes
Commuting	12%	4%	54%	7%	1%	0%	4%	5%	0%	5%	7%	1%	1%	100%
Business	8%	2%	65%	7%	0%	1%	3%	2%	0%	3%	7%	1%	0%	100%
Education / escort education	41%	1%	22%	23%	0%	2%	3%	6%	0%	0%	1%	1%	0%	100%
Shopping	25%	1%	46%	19%	0%	1%	2%	4%	0%	0%	1%	1%	0%	100%
Other escort	15%	0%	54%	28%	0%	0%	1%	1%	0%	0%	0%	0%	0%	100%
Personal business	23%	1%	43%	23%	0%	1%	2%	3%	0%	1%	1%	1%	0%	100%
Leisure	16%	2%	38%	33%	0%	1%	2%	3%	0%	1%	2%	2%	0%	100%
Other including just walk	99%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
All purposes	26%	2%	40%	21%	0%	1%	2%	3%	0%	1%	2%	1%	0%	100%

Table 5.7 - NTS Table 409a (Format adjusted for Swansea)

Mode	Education / escort education	Shopping	Other escort	Personal business	Leisure	Other including just walk
Walk	41%	25%	15%	23%	16%	99%
Bicycle	1%	1%	0%	1%	2%	0%
Car / van driver	22%	46%	54%	43%	38%	1%
Car / van passenger	23%	19%	28%	23%	33%	0%
Motorcycle	0%	0%	0%	0%	0%	0%
Other private transport	2%	1%	0%	1%	1%	0%
Bus	8%	6%	2%	5%	4%	0%
Rail	2%	1%	0%	2%	3%	0%
Taxi / minicab	1%	1%	0%	1%	2%	0%
Other public transport	0%	0%	0%	0%	0%	0%
All modes	100%	100%	100%	100%	100%	100%

Details: London Underground combined with rail; London Bus and Coach combined with Bus

5.12 The mode shares by journey purpose shown in **Table 5.7** have been applied to the remaining Person Trips by journey purpose as follows:

- i) **Table 5.8** - Education Movements by Mode;
- ii) **Table 5.9** - Shopping Movements by Mode
- iii) **Table 5.10** - Personal Business Movements by Mode;
- iv) **Table 5.11** - Leisure Movements by Mode.

Table 5.8 - Education Movements by Mode

Mode	Education / escort education	0700 - 0759		0800 - 0859		0900 - 0959		1600 - 1659		1700 - 1759		1800 - 1859	
		Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart
Walk	41%	2	7	7	31	2	2	1	1	2	1	1	1
Bicycle	1%	0	0	0	1	0	0	0	0	0	0	0	0
Car / van	22%	1	3	4	17	1	1	1	0	1	0	1	0
Car / van passenger	23%	1	4	4	17	1	1	1	0	1	0	1	0
Motorcycle	0%	0	0	0	0	0	0	0	0	0	0	0	0
Other private transport	2%	0	0	0	1	0	0	0	0	0	0	0	0
Bus	8%	0	1	1	6	0	0	0	0	0	0	0	0
Rail	2%	0	0	0	1	0	0	0	0	0	0	0	0
Taxi / minicab	1%	0	0	0	1	0	0	0	0	0	0	0	0
Other public transport	0%	0	0	0	0	0	0	0	0	0	0	0	0
Total	100%	4	16	18	76	4	5	3	2	4	2	3	1

Table 5.9 - Shopping Movements by Mode

Mode	Shopping	0700 - 0759		0800 - 0859		0900 - 0959		1600 - 1659		1700 - 1759		1800 - 1859	
		Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart
Walk	25%	0	1	0	2	2	3	8	4	8	4	6	3
Bicycle	1%	0	0	0	0	0	0	0	0	0	0	0	0
Car / van driver	46%	0	1	1	3	4	5	14	8	14	7	11	6
Car / van passenger	19%	0	0	0	1	2	2	6	3	6	3	4	2
Motorcycle	0%	0	0	0	0	0	0	0	0	0	0	0	0
Other private transport	1%	0	0	0	0	0	0	0	0	0	0	0	0
Bus	6%	0	0	0	0	0	1	2	1	2	1	1	1
Rail	1%	0	0	0	0	0	0	0	0	0	0	0	0
Taxi / minicab	1%	0	0	0	0	0	0	0	0	0	0	0	0
Other public transport	0%	0	0	0	0	0	0	0	0	0	0	0	0
Total	100%	1	2	1	6	9	11	29	17	30	14	23	13

Table 5.10 – Personal Business Movements by Mode

Mode	Shopping	0700 - 0759		0800 - 0859		0900 - 0959		1600 - 1659		1700 - 1759		1800 - 1859	
		Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart
Walk	23%	1	3	1	5	2	3	4	3	6	3	4	2
Bicycle	1%	0	0	0	0	0	0	0	0	0	0	0	0
Car / van driver	43%	1	5	2	9	4	6	8	5	11	5	9	5
Car / van passenger	23%	1	3	1	5	2	3	5	3	6	3	5	2
Motorcycle	0%	0	0	0	0	0	0	0	0	0	0	0	0
Other private transport	1%	0	0	0	0	0	0	0	0	0	0	0	0
Bus	5%	0	1	0	1	1	1	1	1	1	1	1	1
Rail	2%	0	0	0	0	0	0	0	0	0	0	0	0
Taxi / minicab	1%	0	0	0	0	0	0	0	0	0	0	0	0
Other public transport	0%	0	0	0	0	0	0	0	0	0	0	0	0
Total	100%	3	11	5	21	10	13	20	11	24	12	20	11

Table 5.11 - Leisure Movements by Mode

Mode	Personal Business	0700 - 0759		0800 - 0859		0900 - 0959		1600 - 1659		1700 - 1759		1800 - 1859	
		Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart
Walk	23%	1	3	1	5	2	3	4	3	6	3	4	2
Bicycle	1%	0	0	0	0	0	0	0	0	0	0	0	0
Car / van driver	43%	1	5	2	9	4	6	8	5	11	5	9	5
Car / van passenger	23%	1	3	1	5	2	3	5	3	6	3	5	2
Motorcycle	0%	0	0	0	0	0	0	0	0	0	0	0	0
Other private transport	1%	0	0	0	0	0	0	0	0	0	0	0	0
Bus	5%	0	1	0	1	1	1	1	1	1	1	1	1
Rail	2%	0	0	0	0	0	0	0	0	0	0	0	0
Taxi / minicab	1%	0	0	0	0	0	0	0	0	0	0	0	0
Other public transport	0%	0	0	0	0	0	0	0	0	0	0	0	0
Total	100%	3	11	5	21	10	13	20	11	24	12	20	11

Table 5.12 - Education, Shopping, Personal Business and Leisure (Combined)

Mode	0700 - 0759		0800 - 0859		0900 - 0959		1600 - 1659		1700 - 1759		1800 - 1859	
	Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart
Walk	3	11	9	39	8	10	17	10	20	9	15	8
Bicycle	0	1	0	2	0	1	1	1	1	1	1	1
Car / van driver	3	12	8	33	13	17	32	19	36	17	29	16
Car / van passenger	2	9	6	27	8	11	19	11	22	10	18	10
Motorcycle	0	0	0	0	0	0	0	0	0	0	0	0
Other private transport	0	0	0	2	0	0	1	0	1	0	1	0
Bus	1	2	2	8	2	2	4	2	5	2	4	2
Rail	0	1	0	2	1	1	1	1	2	1	1	1
Taxi / minicab	0	0	0	1	0	1	1	1	1	1	1	1
Other public transport	0	0	0	0	0	0	0	0	0	0	0	0
Total	9	37	26	114	33	43	76	44	87	41	70	38

Details: Multimodal movements from Tables 5.8, 5.9, 5.10 and 5.11.

5.13 A summary of the combined vehicle movements associated with each journey purpose is provided in **Table 5.13**.

Table 5.13 - Vehicle Movements Summary (Scenario 1)

Journey Purpose	0700 - 0759		0800 - 0859		0900 - 0959		1600 - 1659		1700 - 1759		1800 - 1859	
	Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart
Commuting & Business	9	36	7	29	5	7	6	4	9	4	10	5
Education	1	3	4	17	1	1	1	0	1	0	1	0
Shopping	0	1	1	3	4	5	14	8	14	7	11	6
Personal Business	1	5	2	9	4	6	8	5	11	5	9	5
Leisure	1	3	1	4	4	5	9	5	11	5	9	5
Total	12	49	14	61	18	24	38	22	45	22	39	21

5.14 The development is anticipated to generate 75 two-way vehicle movements between 08:00 – 08:59 and 67 two-way vehicle movements between 17:00 and 17:59. These movements are considered in the Traffic Effect chapter as Scenario 1.

5.15 A second scenario, Scenario 2 includes a 30% discount to commuting and business trips to account for Welsh Government aspirations for 30% of workers to be able to work from home in the future. Given the site location and mixture of dwelling types, it is anticipated that within the site this percentage could be higher.

5.16 A third scenario, Scenario 3 has been undertaken based on 250 units which reflects the wider site allocation.

5.17 The movements associated with Scenario 2 and Scenario 3 are provided in **Table 5.14** and **Table 5.15** respectively.

Table 5.14 – Vehicle Movements Summary - Scenario 2

Journey Purpose	0700 - 0759		0800 - 0859		0900 - 0959		1600 - 1659		1700 - 1759		1800 - 1859	
	Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart
Commuting & Business	6	25	5	20	4	5	4	3	6	3	7	4
Education	1	3	4	17	1	1	1	0	1	0	1	0
Shopping	0	1	1	3	4	5	14	8	14	7	11	6
Personal Business	1	5	2	9	4	6	8	5	11	5	9	5
Leisure	1	3	1	4	4	5	9	5	11	5	9	5
Total	9	38	12	53	17	22	36	21	43	20	36	19

Table 5.15 – Vehicle Movements Summary - Scenario 3

Journey Purpose	0700 - 0759		0800 - 0859		0900 - 0959		1600 - 1659		1700 - 1759		1800 - 1859	
	Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart
Commuting & Business	11	45	8	36	7	9	8	5	12	6	13	7
Education	1	4	5	21	1	1	1	0	1	1	1	0
Shopping	0	1	1	4	5	7	17	10	17	8	13	7
Personal Business	1	6	3	11	5	7	11	6	13	6	11	6
Leisure	1	4	1	5	5	6	11	7	14	6	11	6
Total	15	61	18	76	23	30	48	28	57	27	49	26

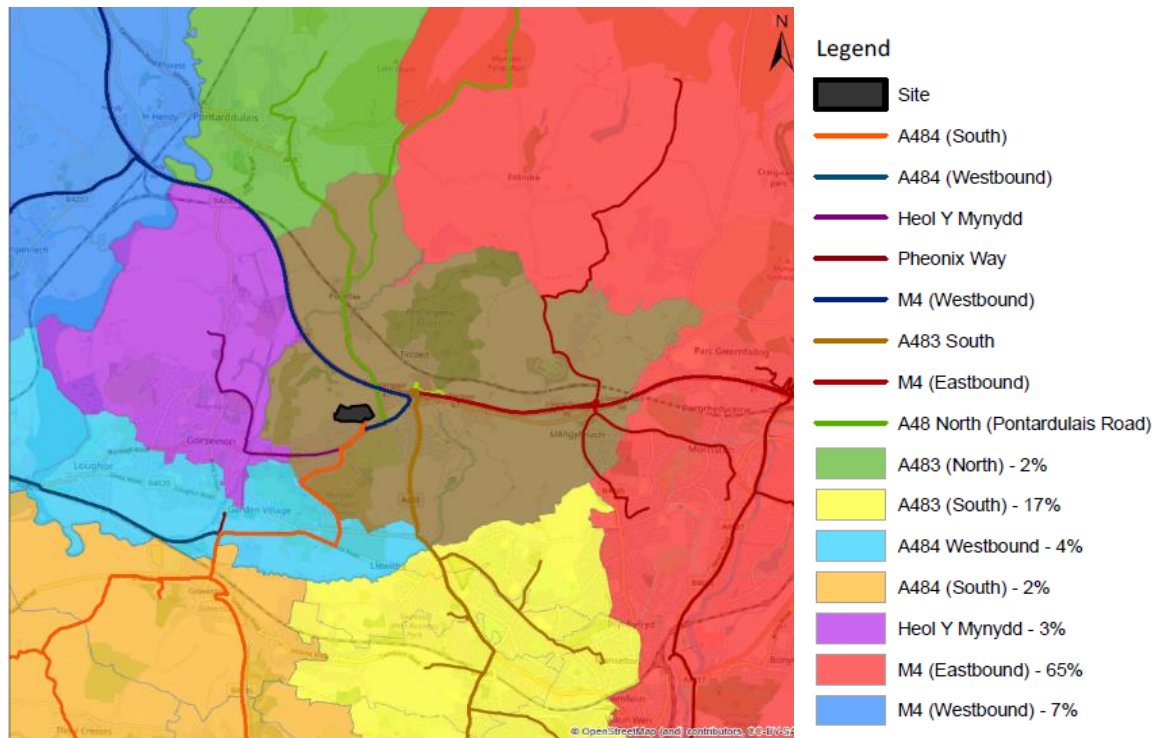
Distribution & Assignment

- 5.18 The distribution of vehicle trips has been undertaken using 2011 Census Journey to Work for the MSOA in which the site is located. This has been based on Location of usual residence and place of work by method of travel to work. The site is located in MSOA ‘Swansea 004’. This area comprehensively covers the residential areas of Penllergaer, Tircoed and Pontlliw.
- 5.19 The distribution for the external trips from the residential element on the site is based on 2011 Census and Working location by main mode of travel to work. Application of this distribution to non-work trips means that the distribution is weighted towards the strategic road network. A proportion of education and leisure trips would likely route more locally. For the purpose of this assessment however this distribution is considered appropriate.
- 5.20 The vehicle routing has been undertaken using ARC GIS routing which is based on a Tomtom dataset (Europe 2020.2. data). This dataset uses historical satellite navigation data to provide anonymously collected aggregated data, providing the ability to predict driving behaviour across the road network. The sample size is not published.
- 5.21 The assignment is based on conditions and journey times on the highway network as an average across the day. There was little variation identified between the AM, PM and Interpeak periods during this time.
- 5.22 The distribution and route choice therefore reflects the existing network congestion and journey times. Routing is determined by the closest destination and therefore there are not multiple routes for each destination. The resulting distribution based on ‘main mode: Driving a Car or Van’ is provided in **Table 5.16**.

Table 5.16 - Residential Journey to Work – Route Assignments

Route	MSOA Sample	Percentage
A483 (North)	62	2%
A483 (South)	509	17%
A484 Westbound	111	4%
A484 South	65	2%
Heol Y Mynydd	97	3%
M4 Eastbound	1,945	65%
M4 Westbound	211	7%
Total	3,000	100%

Figure 5.1 - Vehicle Distribution



5.23 Copies of the distribution figures are also provided in **Appendix H**. The resulting peak period movements by route are provided in **Table 5.17**.

Table 5.17 - Peak Period - Vehicle Movements by Route

Route	%	0700 - 0759		0800 - 0859		0900 - 0959		1600 - 1659		1700 - 1759		1800 - 1859	
		Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart
A483 (North)	2%	0	1	0	1	0	0	1	0	1	0	1	0
A483 (South)	17%	2	8	2	10	3	4	6	4	8	4	7	4
A484 Westbound	4%	0	2	1	2	1	1	1	1	2	1	1	1
A484 South	2%	0	1	0	1	0	1	1	0	1	0	1	0
Heol Y Mynydd	3%	0	2	0	2	1	1	1	1	1	1	1	1
M4 Eastbound	65%	8	32	9	40	12	16	25	14	29	14	25	14
M4 Westbound	7%	1	3	1	4	1	2	3	2	3	2	3	1
Total	100%	12	49	14	61	18	24	38	22	45	22	39	21

- 5.24 The predominate vehicle movements arising from the site are M4 eastbound with 8 arrivals and 37 departures between 08:00 and 09:00 and 27 arrivals and 13 departures between 17:00 – 18:00.

6 Traffic Effect

Overview

6.1 Junction modelling has been undertaken using industry standard junction modelling software (Junctions 9). The following junctions have been modelled due to their proximity to the proposed development and following Pre App discussions with SC. These junctions are as follows:

- **Junction 1** – Mount Crescent / Llewellyn Road / Golwg-Y-Garn;
- **Junction 2** – Llewellyn Road / A4240 Gorseinon Road.

6.2 The assessment has been undertaken for the following peak hours:

- **AM weekday peak hour** (08:00 – 09:00);and
- **PM weekday Peak hour** (17:00 – 18:00).

6.3 Copies of the Junctions 9 modelling output reports are provided in **Appendix I**.

Committed Developments

6.4 Within the local area, the Parc Mawr committed development has been taken into consideration as part of the assessment.

6.5 A review of the Park Mawr application documents has identified traffic flow diagrams which show the route of vehicle traffic through the local highway network (A4240 Gorseinon Road).

Assessment Scenarios

6.6 The following assessment scenarios have been considered:

- **Baseline** – 2020 AM & PM;
- **Future Baseline** – 2028 AM & PM;
- **Future Baseline** + Development (Scenario 1 – 200 units);
- **Future Baseline** + Development (Scenario 2 – 200 units, 30% Working from Home applied);
- **Future Baseline** + Development (Scenario 3 – 250 units).

Junction 1 – Mount Crescent / Llewellyn Road / Golwg-Y-Garn

6.7 The assessment of Junction 1 for the existing operation and future year scenarios is provided in **Table 6.1**.

Table 6.1 – Junction 1 Assessment Scenarios

Arm	AM (08:00 – 09:00)									
	Baseline – 2020		Future Baseline – 2028		Future Baseline + Development (Scenario 1)		Future Baseline + Development (Scenario 2)		Future Baseline + Development (Scenario 3)	
	Q (Veh)	RFC	Q (Veh)	RFC	Q (Veh)	RFC	Q (Veh)	RFC	Q (Veh)	RFC
Llewellyn Road (E)	0.0	0.0	0.0	0.0	0.0	0.02	0.0	0.02	0.0	0.03
Golwg-Y-Garn	0.0	0.04	0.0	0.04	0.0	0.04	0.0	0.04	0.0	0.04
Llewellyn Road (W)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mount Crescent	0.0	0.0	0.0	0.0	0.1	0.11	0.0	0.10	0.2	0.14
Arm	PM (17:00 – 18:00)									
	Baseline – 2020		Future Baseline – 2028		Future Baseline + Development (Scenario 1)		Future Baseline + Development (Scenario 2)		Future Baseline + Development (Scenario 3)	
	Q (Veh)	RFC	Q (Veh)	RFC	Q (Veh)	RFC	Q (Veh)	RFC		
Llewellyn Road (E)	0.0	0.0	0.0	0.0	0.1	0.07	0.1	0.07	0.1	0.09
Golwg-Y-Garn	0.0	0.02	0.0	0.02	0.0	0.02	0.0	0.02	0.0	0.02
Llewellyn Road (W)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mount Crescent	0.0	0.0	0.0	0.0	0.0	0.04	0.0	0.04	0.1	0.05

6.8 It can be seen from **Table 6.1** that the junction continues to operate well within its theoretical operating capacity during each of the assessed scenarios.

Junction 2 – Llewellyn Road / A4240 Gorseinon Road

6.9 The assessment of Junction 2 for the existing operation, future year and future year with the proposed development is provided in **Table 6.2**.

Table 6.2 – Junction 2 Assessment Scenarios

Arm	AM (08:00 – 09:00)									
	Baseline – 2020		Future Baseline – 2028		Future Baseline + Development (Scenario 1)		Future Baseline + Development (Scenario 2)		Future Baseline + Development (Scenario 3)	
	Q (Veh)	RFC	Q (Veh)	RFC	Q (Veh)	RFC	Q (Veh)	RFC	Q (Veh)	RFC
1 – Gorseinon Road (E)	1.2	0.55	1.6	0.61	1.7	0.63	1.6	0.62	1.7	0.63
2 – Gorseinon Road (W)	1.1	0.53	1.5	0.60	1.5	0.60	1.5	0.60	1.5	0.60
3 – Llewellyn Road	0.3	0.2	0.3	0.23	0.6	0.36	0.5	0.34	0.6	0.39
Arm	PM (17:00 – 18:00)									
	Baseline – 2020		Future Baseline – 2028		Future Baseline + Development (Scenario 1)		Future Baseline + Development (Scenario 2)		Future Baseline + Development (Scenario 3)	
	Q (Veh)	RFC	Q (Veh)	RFC	Q (Veh)	RFC	Q (Veh)	RFC	Q (Veh)	RFC
1 – Gorseinon Road (E)	1.8	0.65	2.0	0.67	2.3	0.70	2.2	0.69	2.3	0.70
2 – Gorseinon Road (W)	2.0	0.67	2.1	0.68	2.3	0.70	2.2	0.69	2.3	0.70
3 – Llewellyn Road	0.2	0.17	0.2	0.18	0.3	0.23	0.3	0.23	0.3	0.24

6.10 It can be seen from **Table 6.2** that the maximum Ratio of Flow to Capacity (RFC) is 0.70 which occurs on both Gorseinon Road East and West during the PM peak hour during Scenario 2. Accounting for the development the junction continues to operate well within its theoretical capacity.

Junction 47

- 6.11 M4 Junction 47 has not been considered formally within this assessment, though it should be acknowledged that given the status of the proposed development site in the LDP, the vehicle movements associated with the site should have been considered as growth or committed development within the Park Mawr assessment scenarios.
- 6.12 To provide an indication of the potential impact at Junction 47, the 2028 Park Mawr assessment flows have been compared with the development traffic routing through Junction 47.

Table 6.3 – M4 Junction 47 Summary

Time Period	Vehicle Movements			% Increase
	2028 including Park Mawr	Proposed Development	Total	
AM Peak hour	5,888	84	5,972	1.4%
PM Peak Hour	5,750	74	5,824	1.3%

- 6.13 It can be seen in **Table 6.3** that the proposed development has little change on the vehicle movements routing through Junction 47. The maximum increase of 1.4% during the AM peak hour is not considered discernible within the daily variation in traffic flow.

7 Transport Implementation Strategy

Overview

7.1 The Welsh Government’s Planning Policy Wales Technical Advice Note 18: Transport states that:

7.2 *‘The transport assessment process should include the production of a ‘Transport Implementation Strategy’ (TIS) for the development. This should set objectives and targets relating to managing travel demand for the development and set out the infrastructure, demand management measures and financial contributions necessary to achieve them. The TIS should set a framework for monitoring the objectives and targets, including the future modal split of transport to development sites’.*

7.3 This section considers how future residents will travel to and from the site and what measures will be put in place to monitor mode split targets.

Access Arrangements

7.4 The development will be supported by:

- New site access through extension of the existing Mount Crescent;
- Opportunity for a secondary pedestrian and cycle access with Talbot Road.

Residential Trip Generation

7.5 The trip generation based on the 200 units is provided in **Table 7.1**.

Table 7.1 – Summary of Trip Generation (Peak Periods)

Mode	0700 - 0759		0800 - 0859		0900 - 0959		1600 - 1659		1700 - 1759		1800 - 1859	
	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep
Walk	3	13	9	41	8	11	17	10	20	10	16	9
Bicycle	0	1	0	2	1	1	1	1	1	1	1	1
Car / van driver	12	49	14	61	18	24	38	22	45	22	39	21
Car / van passenger	3	12	7	29	9	11	19	11	22	11	18	10
Motorcycle	0	0	0	0	0	0	0	0	0	0	0	0
Other private transport	0	1	0	2	0	0	1	0	1	0	1	0
Bus	1	4	2	9	2	3	4	3	5	2	4	2
Rail	0	1	0	2	1	1	1	1	2	1	1	1
Taxi / minicab	0	1	0	1	0	1	1	1	1	1	1	1
Other public transport	0	0	0	0	0	0	0	0	0	0	0	0
Total	19	80	34	147	39	51	84	49	98	47	82	44

7.6 The existing (based on journey to work) and proposed mode split are shown below in **Table 7.2**. The implementation of the transport strategy including Travel Plan is designed to reduce the mode share for single occupancy car and increase the mode share for car sharing and cycling.

Table 7.2 – Mode Share Summary

Mode	Existing Mode Split	Proposed Mode Split	Net Change
Car (single Occupancy)	85.5%	79.5%	-6.0%
On Foot	4.4%	4.4%	0.0%
Public Transport	3.8%	3.8%	0.0%
Bicycle	0.4%	3.4%	+3.0%
Passenger in a car or in a van	5.7%	8.7%	+3.0%
Other	0.002	0.2%	0.0%
Total	100.0%	100.0%	

Package of Measures

7.7 The site will be supported by a range of measures to support accessibility as follows:

- Proposed Raised Table / Plateau at the junction of Mount Crescent, Llewellyn Road, Golwg-Y-Garn to provide a traffic calming feature on Llewellyn Road and enhanced environment for pedestrians and cyclists;
- Access into the site via a priority narrowing feature including an off-carriageway cycle route on the eastern side of Mount Crescent;
- The opportunity for a secondary pedestrian and cycle access to the local area through the provision of a pedestrian & cycle link up to the site boundary with Talbot Road.
- The provision of a Travel Plan (TP) which will underpin the development including monitoring of mode share over the course of a 5-year period. The TP will also seek to promote SC's developing Integrated Network which is being delivered to the south of the site on A4240 Gorseinon Road. It will also consider potential incentivisation for car sharing.

Summary

7.8 This section has set out the Transport Implementation Strategy for the site. It has detailed the access arrangements and the multimodal trip generation for peak periods. The existing and target mode share has been identified and the package of measures to support this has been outlined at this stage.

8 Summary and Conclusion

Summary

- 8.1 This Transport Assessment has been prepared by Vectos on behalf of Barratt Homes to set out transport and highway matters associated with a residential development at the site referred to as land north of Llewellyn Road, Penllergaer.
- 8.2 The proposed development comprises 180 residential dwellings with a new access provided via Mount Crescent to the south of the site.
- 8.3 This site is allocated as a committed housing site in the SC LDP (2019). A planning application for a residential development of 200 dwellings was previously consented subject to the signing of a Section 106 agreement although it is understood that this never took place.
- 8.4 The scope of this TA has been discussed and agreed with the officers at SC as part of a pre app scoping exercise. Engagement has also been undertaken with officers at SC to discuss emerging sustainable transport improvements including the provision of a segregated cycle route adjacent to the A4240 between Gorseinon and Penllergaer Interchange. From the site access, this route will be located approximately 400 m away, accessed via Llewellyn Road and upon delivery will provide enhanced connectivity along this corridor.
- 8.5 The site is located within the settlement of Penllergaer, adjacent to an existing residential area. Penllergaer includes a range of local facilities including retail and leisure opportunities, while local education in the form of Penllergaer Primary School is located a reasonable walking distance from the site. Bus route 42 serves Llewellyn Road at several bus stops. This will facilitate access to the local bus network from the site.

Conclusion

- 8.6 The proposed development has been developed in accordance with both national and local policy with respect to promoting active travel and transport choice. It accords with the principles of placemaking as set out within the Future Wales Act. The site includes a range of leisure routes including around the periphery of the site which will support movements by active travel for all ages.
- 8.7 The site is located in an area with a range of facilities within walking distance. It is also located within 400m of an emerging segregated cycle route which is being delivered in phases by SC and will provide improved connectivity between Penllergaer to Gorseinon.
- 8.8 The location of the site will positively integrate with the settlement of Penllergaer and existing transport infrastructure such as bus stops and SC's evolving Integrated Network Map. The site is located in an area with a broad range of local facilities including opportunities for local employment.
- 8.9 Site access is provided via a new access with Mount Crescent to the south of the site. Access to A4240 Gorseinon Road is facilitated via several routes using Llewellyn Road and Heol-Y-Gelli.

- 8.10 A review of Personal Injury Collision data has been undertaken for the local highway network surrounding the site. This has not identified any existing highway safety issue that could be exacerbated by the proposed development.
- 8.11 A detailed assessment of trip generation has been undertaken for the site with the approach discussed with SC as part of the Pre-App scoping. This has been based on the site commitment of 200 units. Trip generation has been undertaken using Person Trip Rates, 2011 Census Journey to Work data and the National Travel Survey. This has enabled multimodal trip generation to be undertaken reflecting the travel characteristics for a residential scheme.
- 8.12 The development is anticipated to generate 75 two way vehicle movements between 08:00 – 08:59 and 67 two way vehicle movements between 17:00 and 17:59. In reality it will likely be less than this as only 180 dwellings are currently proposed.
- 8.13 Two local junctions have been assessed using industry standard junction modelling software. The results of this assessment show that accounting for committed development, both junctions continue to operate well within their theoretical capacity.
- 8.14 The proposed development accords with national and local transport policy objectives, is well positioned to take advantage of existing and emerging sustainable/active travel infrastructure and has minimal traffic effect on the local highway network. Therefore the development should be encouraged by SC.