

LAND AT MODEL FARM RHOOSE

PARC BUSNES PORTH CYMRU

Transport Assessment

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EXECUTIVE SUMMARY

The site forms part of the wider Cardiff Airport - St. Athan Enterprise Zone, which is allocated within the Vale of Glamorgan Local Development Plan 2011 – 2026 (adopted June 2017). The Zone is allocated for 77.4ha of B1, B2 and B8 employment uses and an extension to Porthkerry Country Park.

The scheme takes access onto the primary road network with the route to the M4 for freight vehicles being provided by Principal and Trunk Roads. The scheme will deliver a sustainable development through walking and cycling infrastructure, a public transport strategy and a strong Framework Travel Plan.

The development will comply with National and Local policies. The site is well located in relation to public transport provision, with future improvements benefiting those accessing the site and the local community. Walking and cycling infrastructure will be an integral part of the development and street design will be implemented at the forefront of the detailed design stage.

The scheme will include measures to promote sustainability, providing walking and cycling links to the existing infrastructure and provision of a spine road that enables buses to penetrate the site. Improvements to bus services, through discussion with the Local Highway Authority and the bus operators, will be explored.

A general outline of the development proposals has been provided. The transport issues for the development such as potential mitigation, and detailed access design will be in line with policy and will be determined at the reserved matters and detailed design stage of the application.

The development will generally follow the guidance set out in TVoGC Parking Standards SPG when determining parking levels for cars and cycles. Car parking is likely to be underprovided as a measure to decrease the number of SOV trips to the development, with cycle parking likely to be overprovided. These are measures to increase the site's sustainability.

The development will provide walking and cycling infrastructure, improve existing public transport infrastructure and has the potential to mitigate existing pedestrian infrastructure. The additions brought forward by this development will benefit by the local community and employees.

Trip generation for the network peak hour, calculated using the TRICS database, estimated that there will be 1023 and 895 two-way vehicle movements generated by the development in the AM and PM network hours respectively.

An assessment of the impact of the traffic generated by the development using the SEWTM VISUM model of 11 junctions has been undertaken by Norman Rourke Pryme. The modelling suggested that operational assessments should be undertaken at three junction to determine the transport impact at these locations. The assessments based on future years of 2026 and 2029 show that the proposed northern site access and the existing A4226/B4265/Tredogan Road/Dragonfly Drive junction will operate within their design capacity. The Waycock Cross roundabout will operate over its design capacity but within its theoretical capacity in the AM network peak hour and over its theoretical capacity in the PM network peak hour. Discussions with TVoGC will be held during the application process to discuss potential mitigation.

The Transport Implementation Strategy for the development is considered to be appropriate with the proposals and compliant with the National and Local policies set out by the Welsh Government and TVoGC.

1 INTRODUCTION

- 1.1 This Transport Assessment has been prepared by RPS on behalf of Legal & General (Strategic Land) Ltd to support an outline planning application for an employment development at Model Farm, Rhoose. The planning submission seeks outline planning permission with all matters reserved except for access. The proposed illustrative masterplan is attached at **Appendix A**.

Background

- 1.2 The site is located to the immediate east of Cardiff International Airport and is bounded by the A4226 to the north, Port Road to the west, agricultural fields and Porthkerry Country Park to the south and agricultural fields to the east. It is located approximately two kilometres north east of Rhoose and four kilometres west of Barry. The site in its wider geographical context is shown at **Figure 1**.
- 1.3 The site forms part of the wider Cardiff Airport - St. Athan Enterprise Zone, which is allocated within the Vale of Glamorgan Local Development Plan (LDP) 2011 – 2026 (adopted June 2017). The Zone is allocated for 77.4ha of B1, B2 and B8 employment uses and an extension to Porthkerry Country Park. The Adopted LDP Proposals Map 2017 is available at **Appendix B**.
- 1.4 The ultimate Council led vision for the wider allocation is to create an 'airport city', taking the form of a business destination for local and international businesses including quality office accommodation, specialist education, training facilities and leisure developments.

Development Proposals

- 1.5 The proposed development is envisaged to be approximately 183,725m², broken down into a mix of B1, B2 and B8 land uses (plus ancillary development). The scheme will deliver a sustainable development through walking and cycling infrastructure, a public transport strategy and a strong Framework Travel Plan (FTP).

Scoping of the Transport Assessment

- 1.6 A Scoping Report was submitted to The Vale of Glamorgan Council (TVoGC) and Transport for Wales (TfW) in November 2018, attached at **Appendix C**, with a further Scoping Report Addendum submitted in March 2019, available at **Appendix D**.
- 1.7 Through the scoping process, agreement was met on the following technical items:
- (i) Vehicle trip rates for B1, B2 and B8 use classes;
 - (ii) Modal shift percentages;
 - (iii) Years of assessment; and
 - (iv) Use of the SEWTM VISUM model.

Content of Transport Assessment Report

- 1.8 This Transport Assessment has been prepared in accordance with TAN18 and addresses the transportation and highways issues associated with the proposed development, incorporating comments made on the Scoping Report and Scoping Report Addendum.
- 1.9 The following transportation and highway issues are addressed in detail in this Transport Assessment:
- (i) Executive Summary;
 - (ii) Relevant National and Local transport policy;
 - (iii) Existing and baseline transport conditions;
 - (iv) Details of the proposed development;
 - (v) Car parking management strategy;
 - (vi) Future year transport situation;
 - (vii) Development travel demand;
 - (viii) Strategic modelling;
 - (ix) Transport Impact on the local highway network;
 - (x) Transport Implementation Strategy; and
 - (xi) Summary and conclusion on the Transport Assessment.

Conclusions

- 1.10 This Transport Assessment concludes that the proposed development has suitable access arrangements that can be accommodated without the detriment to the existing safety or operation of the local highway network. A strong Framework Travel Plan (FTP) will be implemented site-wide which will encourage sustainable travel to and from the development.
- 1.11 It is concluded that there are no transportation reasons why the development proposal should not be allowed.

2 POLICY REVIEW

Introduction

2.1 The development proposals will be considered against the following transport policies and guidance:

- Planning Policy Wales (PPW) Edition 10 (2018);
- Technical Advice Note (TAN) 18: Transport (2007);
- People, Places, Futures – The Wales Spatial Plan (2008);
- Wales Transport Strategy – One Wales – Connecting the Nation (2008);
- Sustainable Development Scheme ‘One Wales: One Planet’ (2009);
- The National Transport Plan (2010);
- Active Travel (Wales) Act (2013);
- Vale of Glamorgan Local Transport Plan (LTP3) 2015 – 2030;
- Vale of Glamorgan Local Development Plan 2011 – 2026 (2017);
- Vale of Glamorgan Supplementary Planning Guidance - Parking Standards (2019); and
- Vale of Glamorgan Draft Supplementary Planning Guidance – Travel Plan (2018).

National Policy

Planning Policy Wales Edition 10 (2018)

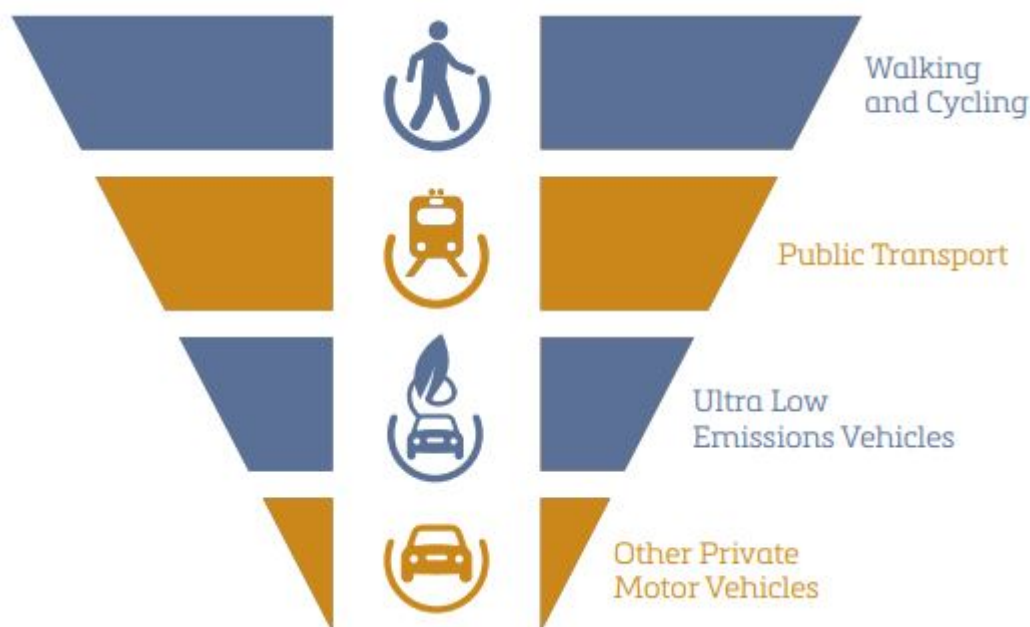
2.2 Planning Policy Wales (PPW) sets out the land use planning policies of the Welsh Government. It is supplemented by a series of Technical Advice Notes (TANs), Welsh Government Circulars and policy clarification letters, which together with PPW provide the national planning policy framework for Wales.

2.3 Chapter 4 of the policy sets out criteria that all future development should incorporate within design. In brief, developments should:

- Enable people to access jobs and services through shorter, more efficient and sustainable journeys;
- Support sustainable development;
- Promote an increase in physical activity, therefore improving health; and
- Help to tackle the causes of climate change.

2.4 This should be achieved through enabling more sustainable travel choices, such as measures to increase walking, cycling, public transport usage, increases to the use of low emission vehicles,

reduction in the dependency on the car for daily travel and methods which aim to reduce single-occupancy private vehicle trips. **Figure 8:** The Sustainable Transport Hierarchy for Planning within the Policy document shows the hierarchical approach to reduce vehicle trips and can be viewed below:



TAN 18 (2007)

- 2.5 This Technical Advice Note details how to integrate land use and transport planning, explaining how transport impacts should be assessed and mitigated. The Assembly Government adopts a sustainable development approach, as stated within paragraph 2.2. This includes:
- “Integration of transport policy with policies for the environment, education, social justice, health, economic development and wealth creation.”
- 2.6 Paragraph 2.3 states that the sustainable policy objectives will be met through the integration of transport and land use by:
- “Ensuring new development is located where there is, or will be, good access by public transport, walking and cycling;
 - Ensuring that new developments include appropriate provision for pedestrians, cycling, public transport, and traffic management and parking;
 - Ensuring that transport infrastructure or service improvements necessary to serve new development allow existing transport networks to continue to perform their identified functions.”
- 2.7 Paragraph 3.7 states:
- “Development plans should seek wherever possible to identify locations ... which offer genuine and easy access by a range of transport modes and therefore:

- allocate major generators of travel demand ... near public transport interchanges, as a means to reduce car dependency and increase social inclusion by ensuring that development is accessible by public transport for those without access to a car;
- consider the potential for changing existing unsustainable travel patterns, for example through a co-ordinated approach to development plan allocations and transport improvements.”

2.8 Within paragraph 6.2 it is stated that developers should:

- ‘Ensure that new development encourages walking as a prime means for local journeys by giving careful consideration to location, access arrangements and design, including the siting of buildings close to the main footway, public transport stops and pedestrian desire lines.’

Wales Transport Strategy - One Wales - Connecting the Nation (2008)

2.9 The One Wales Transport Strategy aims to maximise the positive contribution that transport makes and to promote healthy lifestyles, such as walking and cycling for journeys. It prioritises actions that influence the number of trips, distance travelled, and mode of travel chosen, such as ensuring that new developments take transport implications into account. It links decisions on the location of employment with the impacts they will have on the way people travel.

2.10 The Welsh Government promotes the widespread adoption of Travel Plans by new developments. These assist with the efficient management of the highway network and promote alternative modes of transport. The need for a Travel Plan has been identified as part of the scoping discussions with the Council.

Sustainable Development Scheme ‘One Wales: One Planet’ (2009)

2.11 The Sustainable Development Scheme of the Welsh Assembly Government titled ‘One Wales: One Planet’ (May 2009) has a main outcome of “a low carbon transport network which promotes access rather than mobility, so that we can enjoy facilities with much less need for single occupancy car travel”. Under the heading of ‘What a Sustainable Wales Would Look Like’ is:

- “Walking and cycling are much more commonplace. There is greatly enhanced provision for cyclists and pedestrians... with improved walking and cycling networks, as well as better street design and traffic management measures.
- There is a coherent network of sustainable transport options within rural Wales.
- Travel Plans are part of all new developments. All employers develop and implement Travel Plans.”

Active Travel (Wales) Act (2013)

2.12 This Act makes it a legal requirement for local authorities in Wales to map and plan suitable routes for active travel, and to build and improve their infrastructure for walking and cycling every year. It creates new duties for highway authorities to consider the needs of walkers and cyclists

and make better provision for them. It also requires both the Welsh Government and local authorities to promote walking and cycling as a mode of transport.

2.13 By connecting key sites such as workplaces with active travel routes, the Act will encourage people to rely less on their cars when making journeys. In considering whether it is appropriate for a route to be regarded as an active travel route, a local authority must take into account:

- whether the route facilitates the making by, or by any description of, walkers and cyclists of active travel journeys; and
- whether the location, nature and condition of the route make it suitable for safe use by, or by any description of, walkers and cyclists for the making of such journeys.

2.14 The Act requires Local authorities to produce and publish Existing Routes Maps. These maps show routes within the area that are suitable for active travel and which meet standards set by the Welsh Government. As such the Existing Routes Maps, do not show all available walking and cycling routes within an area. The Welsh Government approved TVoGC's Existing Route Maps in August 2015. The Existing Route Maps for Rhose and Barry are available at **Appendix E**.

TVoGC Local Transport Plan 2015-2030

2.15 The Local Transport Plan (LTP) seeks to identify the sustainable transport measures required to ensure the Vale of Glamorgan Council adheres to current requirements and good practices to allow for a sustainable transport environment for the period 2015 to 2020 as well as looking forward to 2030.

2.16 The LTP seeks ways to secure better conditions for pedestrians, cyclists and public transport users and to encourage a change in travel choices away from the single occupancy car. It also aims to tackle traffic congestion by securing improvements to strategic highway corridors for commuters who may need to travel by car.

2.17 The LTP seeks to do this by:

- Providing new transport capacity to cope with future demand;
- Improving accessibility and connectivity; and
- Improving access to a wider range of job opportunities by increasing the coverage of public transport, particularly for cross-valley journeys.

TVoGC Local Development Plan (2017)

2.18 The Local Development Plan (LDP) contains the Vision and Objectives for TVoGC, including; Strategy, Strategic Policies, Development Management Policies and Policies for Managing Growth. It outlines the requirements for the delivery and implementation of the sites allocated for development and provides a monitoring framework for measuring the effectiveness of the plan.

2.19 A proposals map was created as part of the LDP showing Council proposed areas for residential, employment, education, recreational and infrastructure development which can be seen at **Appendix B**. Within this map the development site is highlighted as a site for Employment Allocation (MG 9) and Strategic Development (MG10).

- 2.20 All new developments are required to:
- Be highly accessible, with a particular emphasis on walking and cycling to reduce the number of short trips taken by car;
 - Give careful consideration to the location, design, access arrangements, travel desire lines, and integration with off-site links;
 - Promote the use of sustainable travel;
 - Provide a safe and accessible environment; and
 - Have no unacceptable impact on highway safety nor cause or exacerbate traffic congestion.
- 2.21 The LDP strategic policy in relation to Transportation (SP7) reads as follows:
- “Sustainable transport improvements that serve the economic, social and environmental needs of the Vale of Glamorgan... will be favoured; and
 - Priority will also be given to schemes that improve highway safety and accessibility, public transport, walking and cycling.”
- 2.22 Within the Councils LDP, strategic policy SP1 seeks to:
- “Improve the living and working environment, promote enjoyment of the countryside and coast and manage important environmental assets.”
- 2.23 In transport terms, it seeks to achieve this by:
- Promoting sustainable transport;
 - To deliver key infrastructure linked to the impact of development;
 - To promote opportunities for sustainable recreation; and
 - Favour development that promotes healthy living.

TVoGC Draft Travel Plan SPG (2018)

- 2.24 A Framework Travel Plan (FTP) will be submitted alongside this application in accordance with the guidance set out within this draft document. The FTP will set out overall site-wide outcomes, targets, measures and marketing techniques to promote a sustainable development to employees and visitors.

Summary

National and Local Policies

- 2.25 National policy is provided by Planning Policy Wales, TAN18, One Wales and the Active Travel Act. These documents aim to promote sustainable travel to and from developments. New developments should be in areas that maximise sustainable transport opportunities, provide for pedestrians and cyclists, manage traffic and parking levels, and incorporate street design and Travel Plans as a major influence for all new developments.

- 2.26 Local policy is provided by the LTP and LDP which identify the sustainable transport measures required to ensure TVoGC adheres to current requirements and good practises for a sustainable transport environment. The site is allocated within the LDP for Employment Allocation and Strategic Development.
- 2.27 The documents include policies that set out that all new developments must be highly accessible with emphasis on walking and cycling to reduce the number of short trips taken by car, promote the use of sustainable travel and have no unacceptable impact on highway safety or have an adverse impact on traffic congestion.

Conclusion

- 2.28 This section has identified relevant national and local transport related policies that are relevant to the proposed development. These policies and principles have been taken into account in the design of the proposed development. It is considered that the proposed development generally accords with these policies.
- 2.29 The site is well located in relation to public transport provision, with future improvements benefiting those accessing the site and the local community. Walking and cycling infrastructure will be an integral part of the development, with street design implemented at the forefront of detailed design. Traffic and parking management schemes will be introduced to reduce the number of single occupancy vehicle trips and a Framework Travel Plan will be implemented site-wide, promoting healthy lifestyles and sustainable transport modes.

3 EXISTING AND BASELINE TRANSPORT CONDITIONS

Site Location

- 3.1 The site is located to the immediate east of Cardiff International Airport (CIA) and is bound by the A4226 to the north, Port Road to the west, agricultural fields and Porthkerry Country Park to the south and agricultural fields to the east. It is located approximately two kilometres north east of Rhoose and four kilometres west of Barry. The site in its wider geographical context can be seen in **Figure 1**.
- 3.2 The site forms part of the wider Cardiff Airport - St. Athan Enterprise Zone, which is allocated within the Vale of Glamorgan Local Development Plan 2011 – 2026 (adopted June 2017). The Zone is allocated in the Local Development Plan for 77.4ha of B1, B2 and B8 employment uses and an extension to the Porthkerry Park. The ultimate Council led vision for the wider allocation is to create an 'airport city' taking the form of a business destination for local and international businesses including quality office accommodation, specialist education, training facilities and leisure developments.

Local Highway Network

- 3.3 The local highway network is illustrated in **Figure 1**. The extent of the adopted highway in the vicinity of the site is included at **Appendix F**.

Port Road

- 3.4 Port Road routes from the north of the site to the south-west of the site along the entirety of the western site boundary. The road is an urban clearway, restricting vehicles from stopping for one and three-quarter miles, has a 50mph speed limit and is street-lit.
- 3.5 The road has three roundabout junctions, one simple priority junction and several private accesses. The simple priority junction serves Blackton Lane, which provides access to a small number of dwellings.
- 3.6 A roundabout junction with three arms connects Port Road and the A4226, at the north-eastern end of the road.
- 3.7 A second roundabout junction is located approximately 170 metres from the south-western end of the road. This junction has four arms which provides access to CIA and Holiday Inn Express.
- 3.8 A third roundabout junction is located at the south-western end of Port Road. This junction has three arms which serve Port Road, Porthkerry Road and an Unnamed Road serving Raven Express Logistics.

A4226

- 3.9 The A4226 routes north-east to south-west from Barry to the north of CIA. The A4226 has four roundabout junctions along its route. There is a speed limit of 50mph from the 'Waycock Cross' roundabout to the A4226 / B4265 roundabout, with street lighting provided.

- 3.10 The first roundabout is in Colcot and has three arms. The roundabout serves the A4226, A4050 and Colcot Road. The A4050 is a continuation of the A4226, heading north-east towards the Culverhouse roundabout junction to the west of Cardiff.
- 3.11 The second roundabout is located north-west of Barry and is known as 'Waycock Cross'. The roundabout has four arms which connect the A4226, Waycock Road (Five Mile Lane) and B4266. The B4266 Pontypridd Road routes into Barry.
- 3.12 The third roundabout is located to the north of the site. This roundabout has three arms which serve the A4226 and Port Road.
- 3.13 The fourth roundabout is located north of CIA. The roundabout has five arms and serves the A4226, B4265, Tredogan Road and Dragonfly Drive. Dragonfly Drive routes south-west to airport hangers.

Five Mile Lane

- 3.14 Five Mile Lane is a highway link improvement along the A4226 (Waycock Road), designed to improve access from the M4 corridor and Cardiff to Cardiff Airport Enterprise Zone, commissioned by the Welsh Government. The aim of Five Mile Lane is to improve journey time and network resilience to Cardiff Airport Enterprise Zone and to overcome congestion on Port Road. The highway improvements scheme is currently under construction and is estimated for completion in summer 2019. Street lighting is proposed on the approach to Waycock Cross roundabout only.
- 3.15 The scheme will upgrade the road to a single lane carriageway of 7.3 metres width. The Waycock Cross roundabout will be upgraded as part of the scheme, undergoing widening to two lanes on the A4226 arm and a length of unsegregated footway / cycleway will be provided to the Waycock Cross roundabout. The improvement for Waycock Cross is included at **Appendix G**.
- 3.16 The 'Sycamore Cross' junction is a staggered crossroad signalised junction accessed when travelling north along Five Mile Lane from the Waycock Cross roundabout, which will also be upgraded as part of the scheme. The work at this junction will increase capacity for turning movements at the junction, allowing for the highway improvement scheme to be maximised. The route will provide access to the A48, an alternative route to the Culverhouse gyratory roundabout. The improvement for Sycamore Cross is attached at **Appendix H**.

Porthkerry Road

- 3.17 Porthkerry Road routes from the south-west of the site. The road begins at the roundabout junction of Port Road / Porthkerry Road / Unnamed Road (serving Raven Express Logistics) and meanders south-west towards Rhoose. The road is street-lit and subject to a 50mph speed limit.
- 3.18 There are four simple priority junctions on this road; two of these junctions serve unnamed roads, one serving a few dwellings and the other serving a leisure park, church and farm. One of the other junctions serves Murlande Way and the other serves Rhoose Way; both roads serve residential areas.
- 3.19 Porthkerry Road also has two roundabouts along its course. The first roundabout has three arms, serving Porthkerry Road and Pentir Y De. The second roundabout is located at the end of

Porthkerry Road and serves Porthkerry Road, Rhoose Road and Readers Way. Rhoose Road routes into the centre of Rhoose and Readers Way provides access to a residential area.

Tredogan Road

- 3.20 Tredogan Road routes from north to south from the village of Penmark to car parking areas for CIA.

B4265

- 3.21 The B4265 is a continuation of the A4226 and is accessed west of the site. The road routes west through Llantwit Major and culminates in Bridgend.

Walking and Cycling

- 3.22 Footways are provided on the southern section of Port Road, south of the Holiday Inn Express roundabout access, and provide access to the Holiday Inn Express bus stops. These footways connect, albeit with the need to cross Port Road twice, to the shared use cycleway on the northern side of Porthkerry Road which provides a continuous link into Rhoose. The footways are well lit.
- 3.23 There are no footways on the northern section of Port Road or on the A4226, to the north of the site.
- 3.24 There are public footpaths which connect the site to Barry as well as the Wales Coastal path, to the south of the site. This can be seen on **Figure 2**. Public Right of Way (PRoW) footpath P4 17/1 provides access from the A4226 to Porthkerry Country Park and routes partially within the site, close to the eastern boundary.
- 3.25 National Cycle Network (NCN) route 88 can be accessed on Porthkerry Road and used to route to Barry and Llantwit Major, together with Ewenny, just to the south of Bridgend. There is also a local cycle link to the NCR from Rhoose which connects the site to the Rhoose (CIA) Railway Station, as shown on **Figure 2**.
- 3.26 Isochrone maps showing the walking distances and times from the centre, eastern and western parts of the development have been created and are available at **Figure 3**, **Figure 4** and **Figure 5**. Distances were calculated based on 80 metres covered per minute on foot. In brief, the maps show that the site is accessible from Rhoose (CIA) Rail Station and residential areas of Rhoose and Barry within 40 minutes walking distance.
- 3.27 A cycle isochrone map has also been created from the centre of the site, available in **Figure 6**. Distances have been calculated based on 320 metres covered per minute whilst cycling. In brief, the isochrone map shows that the development is accessible from six rail stations, the entirety of Rhoose and Barry and further afield within 25 minutes cycle distance.

Public Transport

- 3.28 There are currently three bus stops in the vicinity of the site, providing four services. These provide links to Cardiff International Airport, Rhoose (CIA) Rail Station, Barry, Barry Rail Station, Llantwit Major, Bridgend and Cardiff.

- 3.29 There are six rail stations within 25 minutes cycle time of the station. The two closest, Rhoose (CIA) and Barry Rail Stations, provide services to and from Cardiff Central, Newport, Bridgend, Aberdare and Merthyr Tydfil.

Bus

- 3.30 There are three bus stops in the vicinity of the site. A summary of the frequency of the services is provided in **Table 3.1**.

Wellford Farm Bus Stop (North-Eastern Boundary of Site)

- 3.31 This stop is located on the A4226 Port Road approximately 300 metres walking distance north-east from the A4226 / Port Road roundabout. The stop provides timetable information and services the 303 and X91 bus routes. There are currently no footways or footpaths to access this stop.

Sky Plaza Hotel Bus Stop (North of Site Boundary)

- 3.32 This stop is located on Port Road approximately 200 metres south-west from the A4226 / Port Road roundabout. The stop provides timetable information and services the 303, X91 and TrawsCymru T9 bus routes. There are currently no footways or footpaths to access this stop.

Holiday Inn Express Bus Stop (South-West of the Site)

- 3.33 This stop is also located on Port Road, accessed approximately 150 metres south of the Holiday Inn roundabout. The stop provides shelter, seating and timetable information and services the 303, 905 and X91 bus routes.

Table 3.1: Frequency of Services Available from Nearby Bus Stops

Service	Stop	Route	Weekday Frequency (per hour)			Time	
			AM Peak (0700- 0900)	Inter- Peak	PM Peak (1630- 1830)	First Arrival	Last Departure
303	Wellford Farm, Sky Plaza Hotel, Holiday Inn Express.	Bridgend - Barry	Two per hour	One per hour	Two per hour	07:25	00:55
905	Holiday Inn Express.	Cardiff Airport – Rhoose Railway Station	One per hour	One per hour	One service	06:20	17:20
X91	Wellford Farm, Sky Plaza Hotel, Holiday Inn Express.	Cardiff – Llantwit Major	One service	-	One service	06:34	18:20
TrawsCymru T9	Sky Plaza Hotel.	Cardiff Airport - Cardiff	Two per hour	Two per hour	Two per hour	04:36	23:04

- 3.34 A meeting held with TVoGC's Group Manager Transport Services explored the current public transport provision. He considered that the 905 service would stop operating and be replaced with the 303 service. The 303 would penetrate the development and connect the site with Cardiff International Airport, Barry and Rhoose (CIA) Rail Station (with an improved 30-minute frequency to match the 2022/2023 improved rail service).
- 3.35 He also stated that the T9 bus service could form the basis of a good bus connection with Cardiff (with additional bus stops within Cardiff and possibly the requirement for an additional bus(es)).
- 3.36 A contribution to fund the public transport strategy will be negotiated with TVoGC and will form part of the Section 106 agreement.

Rail

- 3.37 The site is located between the two rail stations of Rhoose (CIA) and Barry. Both stations offer regular arrivals and departures from Cardiff Central, Newport, Bridgend, Aberdare and Merthyr Tydfil.

Rhoose Cardiff International Airport (CIA) Rail Station

- 3.38 Rhoose (CIA) Rail Station is located approximately 3.9 kilometres south-west of the centre of the site. The walking isochrone map for the western part of the site, shown in **Figure 5**, shows the journey time would be 40 minutes on foot. **Figure 6**, the cycle isochrone maps, shows the journey to the Rail Station would take 11-minutes.

- 3.39 The 905 bus service serves the rail station bus stop, approximately 50 metres walking distance from the station.
- 3.40 The 303 and X91 bus services route to and from the Station Road bus stop in Rhoose, approximately 350 metres walking distance from the station. A zebra crossing is accessible within 40 metres west of this stop, providing safe and suitable pedestrian access between the station and bus stop.
- 3.41 The destinations and frequency of services provided from Rhoose (CIA) Rail Station are summarised in **Table 3.2**.

Table 3.2: Arrival and Departure Frequency Rhoose (CIA) Rail Station

Rhoose (CIA) Rail Station - Arrivals			
Origin	Weekday Frequency		
	AM Peak (0700-0900)	Inter- Peak	PM Peak (1630-1830)
Cardiff Central	60 mins	60 mins	60 mins
Newport	60 mins	30 mins	30 mins
Bridgend	60 mins	60 mins	60 mins
Rhoose (CIA) Rail Station - Departures			
Destination	Weekday Frequency		
	AM Peak (0700-0900)	Inter- Peak	PM Peak (1630-1830)
Cardiff Central	60 mins	60 mins	60 mins
Newport	Two per hour	Two per hour	Two per hour
Bridgend	60 mins	60 mins	60 mins
Aberdare	60 mins	60 mins	60 mins

- 3.42 Rail services at Rhoose will increase from one train per hour to two trains per hour in 2022/23 with increased bus frequency to provide access to the site.

Barry Rail Station

- 3.43 Barry Rail Station is located approximately 4.9 kilometres east of the centre of the site by road (bus and cycle). Alternatively, Barry Rail Station can be accessed using Porthkerry Country Park and the walking and cycling routes and trails provided within it. As seen on **Figure 6** the station can be accessed in 14-minutes. NCN route 88 provides a route from the development to the rail station, providing a safe and suitable cycle route via a shared cycleway / footway.
- 3.44 The 303 bus services the Barry Hotel bus stop, approximately 170 metres north of Barry Rail Station. A zebra crossing is provided adjacent to the stations entrance, providing safe and suitable access to and from the bus stop.

The destinations and frequency of services provided from Barry Rail Station are summarised in **Table 3.3**.

Table 3.3: Arrival and Departure Frequency Barry Rail Station

Barry Rail Stations - Arrivals			
Origin	Weekday Frequency		
	AM Peak (0700-0900)	Inter-Peak	PM Peak (1630-1830)
Cardiff Central	15 – 20 mins	15 – 20 mins	15 – 20 mins
Newport	15 – 20 mins	15 – 20 mins	15 – 20 mins
Barry Island	15 – 30 mins	15 – 30 mins	15 – 30 mins
Bridgend	20 – 40 mins	20 – 40 mins	20 – 40 mins
Aberdare	30 mins	30 mins	30 mins
Merthyr Tydfil	30 mins	30 mins	30 mins
Barry Rail Stations – Departures			
Destination	Weekday Frequency		
	AM Peak (0700-0900)	Inter-Peak	PM Peak (1630-1830)
Cardiff Central	15 mins	15 mins	15 mins
Newport	15 mins	15 mins	15 mins
Barry Island	15 mins	15 mins	15 mins
Bridgend	15 – 30 mins	15 – 45 mins	15 – 30 mins
Aberdare	30 mins	15 – 45 mins	30 – 60 mins
Merthyr Tydfil	30 mins	30 mins	30 mins

Key Origin Locations

- 3.45 The key origin destinations of the site are Rhoose, Barry, Llantwit Major, Bridgend and Cardiff. It is assumed that the majority of employees will travel to and from these destinations. Existing bus and train services provide the opportunity to travel to the development from these origin locations, along with walking and cycling for residents of Rhoose and Barry. A key element will be to ensure suitable bus service is provided to link the site with the Railway Stations.

Site Accessibility by Non-Car Modes

- 3.46 The proposed development is accessible by four bus services, a National Cycle Network route and has two rail stations within 4.9 kilometres of the site, allowing for combined journeys and linked trips to be made.
- 3.47 Existing walking and cycling infrastructure in the vicinity of the site can be seen in **Figure 2**. Walking isochrone maps from the central, eastern and western points of the proposed development are available at **Figure 3, 4 and 5** respectively, and a cycle isochrone map is provided at **Figure 6**. Brief summaries of the distances that can be covered within certain times have previously been covered above.

Personal Injury Collision Data

- 3.48 Personal Injury Accident (PIA) data for the previous five-year period (01/01/14 - 31/12/18) has been requested and provided by the Welsh Government on a confidential basis with strict controls over its reporting, hence the below analysis reflects this.

- 3.49 Locations considered to be affected by the development have been selected to give an overview of the existing safety of the local highway networks. The network for which the PIA data search was requested is shown in **Appendix I**. Analysis of the results has been undertaken and is summarised as follows.

Vicinity of the Site

Port Road

- 3.50 There were six PIAs recorded on Port Road. One of the injury accidents involved a single car and a pedestrian, one injury accident involved two cars, another involved two cars and a goods vehicle, one included a car and two goods vehicles, one included a car and a minibus and the other involved a car and a motorcycle. There was one serious injury and six slight injuries.

A4226 / Port Road roundabout

- 3.51 One injury accident between two cars occurred at this junction. There was one slight injury caused.

Porthkerry Road

- 3.52 One injury accident occurred on this road involving a single vehicle. There was one slight injury caused.

A4226 (between B4265/A4226 roundabout and B4266/A4226 roundabout)

- 3.53 Four PIAs were recorded on this stretch of the A4226. One injury accident involved a private hire car and a car, one involved two motorcycles, another involved a car and two motorcycles and the other involved a car and a minibus. There were three slight injuries and two serious injuries.

A4226 / Cwm-Ciddy Lane Junction

- 3.54 There was one injury accident at this junction involving a motorcycle and a car. This resulted in one slight injury.

Waycock Cross roundabout

- 3.55 Two injury accidents occurred at this roundabout. Both accidents involved two cars each, with 2 slight injuries.

A4226 / B4265 / Tredogan Road / Dragonfly Drive roundabout

- 3.56 Four injury accidents were recorded at this roundabout. One injury accident involved a pedal cycle and a motorcycle, another involved one motorcycle, one involved a motorcycle and a car and the other involved a pedal cycle and a taxi/ private hire vehicle. The injury accidents resulted in three slight and one serious injury.

Summary

- 3.57 The local highway network to the site is considered to have an atypical number of injury accidents for roads of their category, length, traffic flows and the five-year period of analysis.

Wider Highway Network

A4226 / B4266 roundabout to A4050 / A4231 roundabout

- 3.58 Analysis of the PIAs over this 3.9 kilometre stretch of carriageway shows that 26 accidents occurred over the five-year period. From these injury accidents, 43 slight and nine serious injuries were caused. There were no clusters and no injury accidents were identified to be due to highway deficiencies.
- 3.59 From the data, there is an average of 6 injury accidents per year.

A48 Culverhouse roundabout

- 3.60 Analysis of PIAs at the A48 / A4050 / A4232 roundabout has also been undertaken. There was a total of 24 injury accidents (an average of five per year) with a mixture of vehicles involved, including pedal cycles, motorcycles, cars, goods vehicles and buses/ coaches. Of these injury accidents, there were no fatalities, with six serious injuries and 23 slight injuries sustained. It is considered that the injury accidents are not a result of the highway design, with all injury accidents due to human error.

Summary

- 3.61 There were 32 injury accidents recorded within the wider highway network over the previous five-year period, an average of six injury accidents per year. It is not considered that there are highway safety reasons as to the causation of these injury accidents, with no clusters, accident patterns or problems recorded.

Personal Injury Accident Data Conclusions

- 3.62 The analysis of the PIA data indicates that there are no common contributory factors of injury accidents which would highlight any potential deficiency in the design of the highway network. Therefore, there are no prevailing highway safety issues that need to be addressed within the area of the scope. It is therefore concluded that analysis has shown that there are no existing highway safety issues along the highway network selected for analysis.

Conclusion

- 3.63 It is concluded that the site is well located, close to existing infrastructure and that the site location has the potential to encourage trips by non-car modes. Analysis of PIA's indicates that there are no highway safety issues that need to be addressed.

4 DEVELOPMENT PROPOSALS

Development Proposals

- 4.1 The development site comprises of approximately 40Ha of allocated land to the east of Cardiff International Airport (CIA) in Rhoose, Wales. The site is bound to the north by the A4226, Porthkerry Country Park to the east, agricultural fields to the south and Port Road to the west. The outline proposal is for 183,725m² Gross Floor Area (GFA) comprising of the following mix:
- B1 Office – 75,890m²;
 - B2 General Industrial – 37,945m²; and
 - B8 Storage and Distribution - 75,890m².
- 4.2 A copy of the illustrative concept masterplan is attached at **Appendix A**.

Vehicular Access Strategy

- 4.3 It is proposed that the development is accessed from two points from the existing highway network. There will be one access in the north of the development, served by the addition of a fourth arm to the existing Port Road and A4226 three arm roundabout. The second access will be in the south of the site, from the unnamed road serving the Holiday Inn Express which is accessed from the Port Road, CIA access and unnamed road roundabout.

Northern Site Access Junction

- 4.4 The Port Road and A4226 roundabout will be repositioned and enlarged with a fourth arm added to optimise the capacity for vehicle movements accessing the site. Design work for this junction will be submitted at the detailed design stage of the application. The preliminary access proposal is available in **Appendix J**.

Southern Site Access Junction

- 4.5 The southern access will be a simple priority junction which connects to the unnamed road that serves the Holiday Inn Express. Appropriate visibility splays will be provided for the junction. The preliminary access proposal available at **Appendix K**.

Servicing

- 4.6 Suitable servicing, including adequate turning space, will be provided for HGVs. Designated areas for waste collection will also be provided. Internal carriageway design and servicing will be finalised in the reserved matters applications.

Site Layout

- 4.7 As shown on the masterplan, one side of the spine road is proposed to be a footway, with the other side proposed as a shared cycleway / footway.

- 4.8 The internal walking and cycling routes will include dropped kerbs, pedestrian refuges (if and where required) and lighting. This will establish a safe environment for pedestrians and cyclists.
- 4.9 Pedestrian and cycle links will be provided to the existing PRow footpath P4 17/1 and NCN 88 route within the vicinity of the site. This PRow and cycle route form the basis of links to and from key origin destinations and public transport hubs.
- 4.10 The footway and cycleways will link onto routes within Porthkerry Country Park to the east of the site. Access to Barry is provided through this Park, with footpaths and NCN 88 maintained by TVoGC and Welsh Government respectively
- 4.11 Bus penetration is proposed for the site, with bus stops to be strategically placed in the detailed design stage. This will increase accessibility to the maximum number of users, in order for full advantage of bus penetration to be taken. Raised kerbs will also be provided at the stops, making the service accessible to all users.
- 4.12 The speed limit of vehicles within the site will be set at 20mph. This will have road safety benefits, as well as encouraging more physical activity, such as walking and cycling, by contributing towards a safer environment.
- 4.13 Traffic calming measures, such as raised zebra crossings across speed tables, will also be considered. The money that goes into these schemes could also improve the character of the area and quality of life of the employees.
- 4.14 Traffic Regulation Orders (TRO) of double yellow lines will be implemented along the internal spine road and the access roads to buildings. This will prevent overspill parking and limit the number of vehicles accessing the site.
- 4.15 The potential transport infrastructure (not including changes that may come forward with this development) within the vicinity of the site by 2023 are shown in **Figure 7**.

Sustainable Access Strategy

- 4.16 The development will be designed to maximise the level of sustainable transport capability to the site. This will be achieved through the creation of walking and cycling links onto the existing highway network and pedestrian and cycling infrastructure, bus penetration and internal bus stops and appropriate walking and cycling facilities.

Walking

- 4.17 The internal walking routes of the development will have dropped kerbs, be well lit and include four connecting routes along predicted desire lines to link onto existing pedestrian infrastructure (one pedestrian only link and three shared pedestrian / cycle links). Links to the existing bus stops and NCN 88's shared footway / cycleway will also be provided. PRow P4 17/1 will be maintained, providing a link between the development and Porthkerry Country Park and the walking routes within.
- 4.18 Off-site mitigation will be discussed with TVoGC to improve the existing walking routes into Rhoose and Barry.

- 4.19 Walking distances and times are shown in the isochrone maps provided in **Figure 3**, **Figure 4** and **Figure 5**. Showering and changing facilities will also be provided by businesses to their employees.

Cycling

- 4.20 A shared cycleway / footway is to be provided as part of the development. This will route along the internal spine road of the site and connect to the existing highway network at three different cycle accesses. One access will link directly onto NCN 88, providing a link to Rhoose and through to Barry, and another will link onto the A4226 which is proposed to come forward as a cycle route by TVoGC by 2023.
- 4.21 Cycling distances and times are shown in the isochrone map provided in **Figure 6**. Secure, covered cycle parking spaces, showering and changing facilities will also be provided by businesses to their employees.

Public Transport

Bus Access Strategy

- 4.22 TVoGC are receiving developer contributions from developers for the improvement of public transport services and therefore, will separately confirm the final public transport strategy associated with the Model Farm development.
- 4.23 The 905 service may be retired and incorporated into the 303 route with its proposed increased frequency of two per hour to meet the improved train frequency service. The 303 is expected to route between Rhoose (CIA) Rail Station, Cardiff International Airport and the development.
- 4.24 A potential increase to the TrawsCymru T9 service and additional bus stops will also allow for greater accessibility. These improvements are tailored toward improvements of the Sustainable Transport Hierarchy for the development and will provide access to the site from the Welsh capital and surrounding areas at a high service frequency.

Rail Service

- 4.25 The inbound and outbound service to and from Rhoose (CIA) Rail Station will benefit from an increased frequency. TfW have committed to increasing the service from one train per hour to two trains per hour (half-hourly) in 2022/23. This increase will be accompanied by an increasing the service of the 303 bus service, providing a higher frequency of service between the station, Cardiff International Airport and the development.

Mitigation

- 4.26 Improvements to accessing public transport, the frequency of services and bus infrastructure has been discussed with TVoGC. An increase to the frequency of the 303 service to every 30 minutes, route diversion to penetrate the site. Additional stops on the TrawsCymru T9 service will allow for wider accessibility.
- 4.27 Walking and cycling routes will be provided from the site to the existing public transport links. Shelters and seating will also be provided at selected bus stops on Port Road. Footways that

connect the site with the bus stops on Port Road and raised kerbs for suitable access will also be considered.

4.28 A route inspection of the off-site pedestrian infrastructure identified shortfalls and the following mitigation should be considered for the scheme:

- Tactile Paving at the Porthkerry Road / Murlands Way junction south-west of the site, for pedestrian use when using Rhoose (CIA) Rail Station;
- Tactile Paving at the Porthkerry Road / Murlands Way junction which serves house numbers 4, 5 and 6 south-west of the site, for pedestrian use when using Rhoose (CIA) Rail Station;
- Tactile Paving at the Rhoose Road / Romilly Road junction south-west of the site, for pedestrian use when using Rhoose (CIA) Rail Station; and
- A footpath access for Porthkerry Country Park at the Park Road / Coed Yr Odyn junction east of the site, for pedestrians using the Porthkerry Country Park footpath connections.

Key Origin Locations

4.29 Sustainable travel will be provided from the key origin destinations of Rhoose, Barry, Llantwit Major, Bridgend and Cardiff. Existing public transport links provide access to the site, with the proposed improvements set to provide increased frequencies and improved service facilities, targeting sustainable access to the development from the outset.

4.30 Walking and cycling links will be provided to Rhoose and Barry by existing infrastructure, as well as proposed mitigation which will bring improvements.

Benefits to the Local Area

4.31 The shared footway / cycleway that route along the internal spine road will provide a safe route that pedestrians and cyclists can use, with potential to link to the proposed cycle route for the A4226 and further afield to Five Mile Lane. Potential for improvements to be made through the suggested pedestrian infrastructure mitigation will benefit the community of Rhoose and Barry, with better pedestrian crossing opportunities and access to Porthkerry Country Park provided.

4.32 The increase to the frequencies of bus and train services will provide the opportunity for local residents to travel to and from Barry, Rhoose, Llantwit Major and Cardiff at an increased frequency.

Summary

4.33 The development proposals will follow the guidance set out within the relevant supporting National and Local policy documents. Full details of the development will be determined in the reserved matter and detailed design stage of the application.

5 CAR PARKING MANAGEMENT

- 5.1 This Chapter details draft measures for a Car Parking Management Plan (CPMP) which can be drawn upon when creating a full CPMP for the reserved matters applications. The Framework Travel Plan is to be submitted alongside this application and a Transport Implementation Strategy, further details of which are provided in **Chapter 10**, should also be drawn upon.

Suggested Vehicle Parking Standards

- 5.2 The development site is located within Parking Designation Zone E – Deep Rural of TVoGC Parking Standards SPG. Therefore, the suggested parking standards in **Table 5.1** apply to the site. These will form the basis for maximum car parking numbers.

Table 5.1: Suggested Vehicle Parking Standards

Use Class	Size / Type	Parking Ratio	
		Operational	Non-operational
B1 Office	< 1000m ²	1 space per 25m ²	
	> 1000m ²	1 space per 40m ²	
B2 Industry	< 100m ²	1 van space	1 space
	< 235m ²	1 van space	2 spaces
	> 235m ²	10% of GFA	1 space per 80m ²
	High Tech Industry	10% of GFA	1 space per 20m ²
B8 Warehousing / Distribution	Industrial	10% of GFA	1 space per 140m ²
	Storage	1 space per 500m ²	Nil
	Distribution <1000m ²	35% of GFA	1 space per 80m ²
	Distribution >1000m ²	25% of GFA	1 space per 80m ²

- 5.3 For car parks associated with new employment developments 5% of the total car parking capacity should be designated to disabled parking spaces.
- 5.4 It is stated within PPW Edition 10 that:
- “Parking standards should be applied flexibly and allow for the provision of lower levels of parking.”

- 5.5 Parking will be suppressed to encourage alternative travel modes as part of the measures set out in the FTP. For example, car parking for B1 Office land use could be reduced to 1 space per 55m².

Space Dimensions

- 5.6 The 'standard' car parking spaces will be demarcated with white lines have dimensions in accordance with TVoGC Parking Standards document. A width of 2.4m x 4.8m will be provided for car spaces and disabled drivers vehicles will be provided at 3.6m x 6.0m. Disabled spaces will be located in proximity to building accesses.

Heavy Goods Vehicle (HGV) Policy

- 5.7 Sufficient HGV parking will be provided to meet the need of the occupiers. The following suggested dimensions will be used for the following vehicle type:

- Articulated Vehicles – 16.5m x 2.55m; and
- Rigid Vehicles – 12.0m x 2.55m.

Suggested Cycle and Motorcycle Policy

- 5.8 The suggested cycle parking standards set out within TVoGC Parking Standards SPG are set out in **Table 5.2**.

Table 5.2: Suggested Cycle Parking Standards

Use Class	Parking Ratio	
	Long Stay	Short Stay
B1 Office	1 stand per 200m ²	1 stand per 1000m ²
B2 Industry	1 stand per 500m ²	1 stand per 1000m ²
B8 Warehousing / Distribution	1 stand per 500m ²	No requirement

- 5.9 Cycle parking will be determined with TVoGC at the reserved matters stage of the application, with excess cycle parking likely to be provided to increase the sustainable travel modes available to the development.
- 5.10 Suggested motorcycle parking provision for the development is 5% of total car parking provision and is to be determined with TVoGC at the reserved matters stage.

Car Parking Management Plan Measures

- 5.11 Employees will be advised prior to their start date of the limited number of car parking spaces that are available. Information such as links to car sharing websites, information on public transport and walking and cycling routes will be provided.

- 5.12 The site will consider operating a parking permit policy. The policy may include restricting employees with residency within a set distance, for example five kilometres, from obtaining a permit. Disabled users would take priority.
- 5.13 A car park control gate / barrier could be installed for each car park, with key cards or fobs provided for access if the employee has been granted a permit. This would prevent employees without a permit or with a permit for a different area from parking in spaces designated to each business.
- 5.14 Electric Vehicle Charging Points (EVCP) will feasibly be provided for spaces closest to the entrance of buildings. The level of active and passive EVCP passes will be reviewed so as not to lead to unutilised spaces and a loss space.
- 5.15 Car-share spaces, available to vehicles with two or more passengers, will be provided in preferential locations.
- 5.16 TROs will be put into force throughout the site, preventing parking on the internal roads via double yellow lines. Enforcement action will be applied to those that violate the order.
- 5.17 An enforcement process will be applied to the activities listed below:
- Vehicles not authorised to park (without a permit for the development);
 - Vehicles parking inappropriately or causing an obstruction; and
 - Vehicles not parked in the correct space (disabled space or non-electric vehicle parked in an EVCP space).
- 5.18 The precise measures to be set out in CPMP's that will be adopted will be agreed with TVoGC at the reserved matters stage.

Summary

- 5.19 The development will generally follow the guidance set out in TVoGC Parking Standards SPG. Car parking is likely to be below the maximum standards as a measure to decrease the number of SOV trips to the development and increase the site's sustainability.

6 FUTURE YEAR TRANSPORT SITUATION

- 6.1 The committed and emerging transport schemes and proposals that are set to come forward in future years are referenced in this Chapter.

Highway Proposals

Five Mile Lane

- 6.2 The Five Mile Lane improvement works, including improvements to the Waycock Cross and Sycamore Cross junctions are set to be completed in summer 2019. This scheme has been included in the 2026 and 2029 assessment years.

The 'Pendoylan Link'

- 6.3 The Pendoylan Link is a proposed scheme (yet to be defined but could come forward by 2029) which would connect junction 34 of the M4 with the A48 at the Sycamore Cross junction. This road would be a continuation north from the Five Mile Lane scheme. Due to its position in the WeITAG process this scheme has not been included in the 2026 and 2029 assessment years. However, the scheme offers benefits to the wider highway network and will provide an alternative quality route from the M4 to the site and the CIA.

Pedestrian Proposals

Walking

- 6.4 Walking routes to the development from Rhoose and Barry are proposed to be mitigated, improving the existing infrastructure. The section of NCN 88 that routes within the vicinity of the site is a shared footway / cycleway, so this can also be utilised by employees.
- 6.5 Pedestrian accesses to bus stops on Port Road provided as part of the development will allow for a safe alternative to walking along Port Road (as footways are not provided throughout its entirety).

Cycling

- 6.6 There are cycleways that will come forward within the next five years that will route along the A4226 and within Barry, routing along Broad Street, which serves Barry Rail Station.
- 6.7 NCN route 88 is set to be completed, with extensions proposed. When completed the route will connect Bridgend with Cardiff and Newport, routing alongside the development. Cycle access links will be provided onto NCN 88 from the site.
- 6.8 The Five Mile Lane will provide cycleways at the northern and southern ends of the scheme which will link into the old road. The old road, with lower traffic flows due to the presence of only local traffic, will provide a suitable cycle route between the two links.
- 6.9 The internal cycleway of the site will benefit the local communities as it will provide a safe and suitable link onto the proposed cycle route for the A4226 and Port Road.

Public Transport Proposals

Bus

- 6.10 Discussions with TVoGC have concluded that the 905 service has the possibility of being retired, with the 303 bus service to benefit from an increased frequency and an alteration to its route. The proposal will lead to the 303 service routing to Rhose (CIA) Rail Station, Cardiff International Airport and penetrating the development.
- 6.11 The TrawsCymru T9 service also has the potential for an increased frequency and additional stops within Cardiff.
- 6.12 The development will negotiate a commensurate financial sum to be paid towards the proposed public transport strategy.
- 6.13 Chosen existing bus stops on Port Road will also be upgraded through mitigation to include raised kerbs, shelter, seating and timetable information.

Rail

- 6.14 The frequency of services to and from Rhose (CIA) Rail Station is proposed to increase from one train per hour to two trains per hour. This increased frequency will benefit from the increased 303 bus service frequency and new route.

Committed Development

- 6.15 Committed development is as included within the SEWTA VISUM model.

Summary

- 6.16 The development will provide walking and cycling infrastructure, improve existing public transport infrastructure and has the potential to mitigate existing pedestrian infrastructure. The additions brought forward by this development will benefit the local community and employees.
- 6.17 The potential transport infrastructure proposed in the vicinity of the site is shown in **Figure 7**.

7 DEVELOPMENT TRAVEL DEMAND

Introduction

- 7.1 An overview of the anticipated travel demand of the proposed development by all modes of travel is provided within this chapter. The predicted number of trips has been generated and the modal share has been considered. The methodology within this chapter has been agreed with TVoGC and TfW as set out in the Scoping Note Addendum submitted in April 2019.
- 7.2 The network peak hours were not known at the time of submission of the Scoping Note Addendum and trip rates and vehicle trips for the assumed peak hours of 08:00-09:00 and 17:00-18:00 were utilised within it.
- 7.3 The network peak hours within the SEWTM VISUM model are 07:45-08:45 and 16:30-17:30. Whilst individual junctions may have different peak hours, the development traffic has been considered across the whole network and therefore the model peak hours are considered to be the correct peak hours for modelling the impact of the development on the highway network.
- 7.4 Therefore, the development trip rates and vehicle trips have been calculated for the same hourly periods as the SEWTM VISUM model to ensure an accurate analysis is undertaken.

Vehicle Trip Generation

- 7.5 Further to discussion with TVoGC and TfW, trip attraction for the development on a weekday morning and evening peak hour was requested. The TRICS online database was interrogated for trip rate information observed at similar use class sites throughout the United Kingdom. The following criteria has been used during the site selection process to obtain trip data representative of the proposed development:
 - Employment Business Park; Employment Industrial Estate and Employment Warehousing (Commercial);
 - Vehicle surveys (inclusive of those containing multi-modal surveys);
 - Sites in England, Scotland and Wales excluding Greater London;
 - Survey dates: 01/01/2008 onwards;
 - GFA of 5,000m² and above;
 - Town Centre, Edge of Town Centre and Suburban sites excluded;
 - GFA not in use excluded from trip rate calculations;
 - Sites with Travel Plans excluded; and
 - Site with a Public Transport frequency of 10 or above services per hour were excluded.
- 7.6 Using the criteria above, the estimated initial vehicle trip rates and numbers, produced from the TRICS database for the B1, B2 and B8 Use Classes, are shown in **Table 7.1**. The numbers shown have been calculated to the modelled peak hours. The TRICS output reports are available at **Appendix L**.

Table 7.1: Initial Vehicle Trip Rates and Vehicle Trips (Modelled Peak Hours)

Time	Arrivals		Departures		Two-way	
B1 Office (75,890m²)						
	Trip Rate	Trips	Trip Rate	Trips	Trip Rate	Trips
AM Peak (07:45-08:45)	1.134	860	0.185	140	1.319	1,001
PM Peak (16:30-17:30)	0.166	126	0.928	704	1.094	830
12 Hour (07:00 – 19:00)	4.697	3,565	4.698	3,565	9.395	7,130
B2 General Industrial (37,945m²)						
	Trip Rate	Trips	Trip Rate	Trips	Trip Rate	Trips
AM Peak (07:45-08:45)	0.270	103	0.113	43	0.384	146
PM Peak (16:30-17:30)	0.121	46	0.285	108	0.406	154
12 Hour (07:00 – 19:00)	1.695	643	1.801	683	3.496	1,327
B8 Storage & Distribution (75,890m²)						
	Trip Rate	Trips	Trip Rate	Trips	Trip Rate	Trips
AM Peak (07:45-08:45)	0.096	73	0.056	42	0.152	115
PM Peak (16:30-17:30)	0.052	39	0.106	80	0.158	120
12 Hour (07:00 – 19:00)	0.906	688	1.006	763	1.912	1,451
TOTAL						
	Trips		Trips		Trips	
AM Peak (07:45-08:45)	1,035		226		1,261	
PM Peak (16:30-17:30)	211		892		1,103	

Time	Arrivals	Departures	Two-way
12 Hour (07:00 – 19:00)	4,896	5,011	9,908

- 7.7 The proposed development is to be supported by a Travel Plan that will reduce single occupancy vehicle (SOV) trip generation to the site. Targets to move modal share away from private car use will be implemented.
- 7.8 Additionally, measures will be put in place from the outset of the development, such as Car Parking Management Schemes, to reduce the number of parking spaces available at the site, therefore promoting the use of alternative, sustainable modes of travel other than the private vehicle. The FTP will also be operational from the outset.

Modal Share

- 7.9 A baseline modal share for the development has been estimated using the MSOA 'Glamorgan 014'. This area borders the development and includes Cardiff International Airport, Rhoose and the surrounding area. The development, in actuality, falls with the MSOA Glamorgan 003. However, this covers a sparsely populated area with low levels of development. Within the response to the Scoping Note submitted to TVoGC (Ref: P/DC/2018/00134/PRE) the Council stated that using the MSOA Glamorgan 014 is preferred due to the similarities that are shared with the development. The modal share is considered to best represent the future baseline mode share of the development.
- 7.10 The modal share for the MSOA Glamorgan 014 and the adjusted modal share for the development are shown in **Table 7.2**.
- 7.11 The adjusted modal share has been determined by the measures set out in the strong FTP that will accompany the development and the proposed improvements to pedestrian, cyclist and public transport infrastructure. The adjusted modal share has been discussed and agreed with TVoGC and TfW.

Table 7.2: Initial & Proposed Modal Share

Method of Travel to Work	2011 Census Data	Travel Plan Adjusted
On foot	14.4%	5.0%
Bicycle	3.9%	10.0%
Rail (with bus connections)	1.4%	2.5%
Bus	1.9%	12.5%
Motorcycle	1.2%	2.5%
Passenger in a car or van	5.0%	10.0%
Driving a car or van	70.9%	57.5%
Other	1.4%	0%
Total	100%	100%

- 7.12 Using the forecast modal share (that reflects an 18.9% reduction in SOV use through the implementation of a robust Travel Plan) and applying this to **Table 7.1** results in the trip rates and vehicle trips shown in **Table 7.3**.

7.3: Proposed Adjusted Vehicle Trip Rates and Vehicle Trips

Time	Arrivals		Departures		Two-way	
B1 Office (75,890m²)						
	Trip Rate	Trips	Trip Rate	Trips	Trip Rate	Trips
AM Peak (07:45-08:45)	0.919	698	0.150	114	1.069	811
PM Peak (16:30-17:30)	0.134	102	0.753	571	0.887	673
12 Hour (07:00 – 19:00)	3.809	2,891	3.810	2,891	7.619	5,782
B2 General Industrial (37,945m²)						
	Trip Rate	Trips	Trip Rate	Trips	Trip Rate	Trips
AM Peak (07:45-08:45)	0.219	83	0.092	35	0.311	118
PM Peak (16:30-17:30)	0.098	37	0.231	88	0.329	125
12 Hour (07:00 – 19:00)	1.375	522	1.461	554	2.835	1,076
B8 Storage & Distribution (75,890m²)						
	Trip Rate	Trips	Trip Rate	Trips	Trip Rate	Trips
AM Peak (07:45-08:45)	0.078	59	0.045	34	0.123	93
PM Peak (16:30-17:30)	0.042	32	0.086	65	0.128	97
12 Hour (07:00 – 19:00)	0.735	558	0.816	619	1.550	1,177
TOTAL						
	Trips		Trips		Trips	
AM Peak (07:45-08:45)	840		183		1,023	

Time	Arrivals	Departures	Two-way
PM Peak (16:30-17:30)	171	724	895
12 Hour (07:00 – 19:00)	3,970	4,065	8,035

- 7.13 Using the agreed modal share the trips associated with other modes of travel have been calculated are shown in **Table 7.4**.

Table 7.4: Proposed Modal Share Trips

	AM (07:45-08:45)		PM (16:30-17:30)		12 Hour (07:00–19:00)	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Rail	37	8	7	31	173	177
Bus	183	40	37	157	863	884
Motorcycle	37	8	7	31	173	177
Car Passenger	146	32	30	126	690	707
Bicycle	146	32	30	126	690	707
On Foot	73	16	15	63	345	353

Development Traffic Distribution and Assignment

- 7.14 The proposed development traffic flows have been distributed using the SEWTM model. Further details of this methodology are provided in **Chapter 8**, with the transport impact detailed in **Chapter 9**.

Traffic Flow Figures

- 7.15 The 2026 and 2029 assessment years (as agreed with TVoGC and TfW) traffic flow figures are available in **Chapter 9**.

Summary

- 7.16 The trip generation capabilities of the site have been modelled and adjusted according to the proposed modal share for the development, taking the transport implementation strategy and FTP into consideration. There are 1,023 total vehicle movements predicted in the AM network peak hour and 895 total vehicle trips predicted in the PM network peak hour.

8 STRATEGIC MODELLING

- 8.1 Norman Rourke Pryme have utilised the South East Wales Transport Model (SEWTM) VISUM model. Eleven junctions were selected to be interrogated to assess the percentage impact of the development traffic. **Figure 8** shows the location of the junctions selected.
- 8.2 The SEWTM, commissioned by the Welsh Government in 2015, is a multi-modal disaggregate demand model focused on South East Wales, covering the eleven authority areas of Blaenau Gwent, Bridgend, Caerphilly, Cardiff, Merthyr Tydfil, Monmouthshire, Neath Port Talbot, Newport, Rhondda Cynon Taff, Torfaen and The Vale of Glamorgan as shown in **Plate 9.1**. The development lies within the Area of Detailed Modelling. The model comprises separate highway and public transport assignment models linked together with a demand model. It was agreed with TVoGC and TFW that the assessment for this proposal would utilise only the highway component of SEWTM.



Plate 1: Area of SEWTM

- 8.3 The SEWTM has been designed to:
- Understand the current travel patterns in South East Wales and the performance of the transport system;
 - Monitor changes in travel patterns over time;
 - Predict future travel patterns and conditions on the transport network;

- Assess the impacts of possible interventions in the transport system in a consistent manner;
 - Assess the impacts of land use changes such as new housing developments and employment locations in a consistent manner; and
 - Provide inputs required for transport appraisals and business cases.
- 8.4 The SEWTM base year is 2015, with forecast years of 2026 and 2036 available. However, the 2036 model has not been developed in sync with the 2026 model and therefore, it has been agreed that the 2036 model should not be used.
- 8.5 The modelling has been conducted in accordance with the agreed Strategic Transport Modelling Methodology Report, which is appended to the Scoping Note Addendum attached at **Appendix D** (Appendix A of the Scoping Note Addendum).
- 8.6 A 2029 model has been developed by applying growth rates from TEMPRO software to the 2026 model. The Strategic Modelling Result reports are attached at **Appendix M**.
- 8.7 A 2029 model has been developed by apply vehicle ownership growth rates from TEMPRO software to the 2026 model. The Strategic Modelling Result reports are attached at **Appendix M**.

9 TRANSPORT IMPACT

9.1 This Chapter should be read in conjunction with **Figure 8**, so an overview of the junction locations can be gained.

Link Assessment

- 9.2 A request for the capacity of the Port Road (A4226) link between the site access roundabout and Waycock Cross roundabout was requested by TVoGC during pre-application discussions.
- 9.3 Using the information detailed in the DMRB Technical Advice (TA) 79/99 the road has been classified as an Urban All-Purpose 1 (UAP1) road type. This conclusion has been drawn due to the road meeting the following criteria from 'Table 1: Types of Urban roads' of the document:
- a high standard carriageway carrying predominantly through traffic with limited access;
 - speed limit varies from 50mph to 40mph;
 - 0 to 2 side roads per km;
 - limited access to roadside development;
 - parking and loading are restricted; and
 - bus stops and truck stops are provided in lay-bys.
- 9.4 Table 2 of TA79/99 states that a carriageway of 7.3m width (Port Road (A4226) carriageway width is measured to be 7.5 metres) has a one-way hourly flow in the busiest direction capacity of 1,590 vehicles. Using this figure, a two-way vehicle flow has been calculated of 2,650 vehicles.
- 9.5 The capacity for Port Road West in the years 2026 and 2029, including development , are shown in **Table 9.1** below:

Table 9.1: Port Road (A4226) Traffic Flows

Year	Eastbound	Westbound	Total
2026			
2026 Base AM	933	806	1,739
2026 + Dev AM	1,055	1,448	2,503
2026 Base PM	877	990	1,877
2026 + Dev PM	1,359	1,071	2,430
2029			
2029 Base AM	941	820	1,761

2029 + Dev AM	1,062	1,457	2,519
2029 Base PM	871	1,002	1,873
2029 + Dev PM	1,367	1,081	2,448

- 9.6 As can be seen in the table above, Port Road West will operate under the 2,650 vehicle capacity in all future year situations. It is therefore concluded that this link will operate with adequate capacity.

Junction Models

- 9.7 The SEWTM VISUM model (a simulation model for traffic) was interrogated by Norman Rourke Pryme (NRP) to model the traffic generated by the development in the future years of 2026 and 2029. Junctions were selected to assess percentage impacts. Percentage impact at the eleven junctions have been calculated.
- 9.8 The AM network peak hour in the SEWTM model is 0745 – 0845 and the PM network peak hour is 16:30 – 17:30.

Percentage Impact at Junctions

- 9.9 The percentage change and increases or decreases to vehicle movements at the modelled junctions in the future year of 2026 are summarised in **Table 9.2**, with 2029 summarised in **Table 9.3**.

Table 9.2: Modelled Junctions 2026 AM & PM Peak Percentage Impacts

Junction		Network Peak Hour	Vehicle Movements			% Change (- / +)
			2026 Base	2026 Base + Dev	Increase / Decrease	
1	Northern Site Access roundabout	AM	1,737	2,676	939	54%
		PM	1,870	2,583	713	38%
2	Holiday Inn Express Roundabout	AM	921	885	-36	-4%
		PM	945	889	-56	-6%
3	Port Road, Porthkerry Road, unnamed road roundabout	AM	799	771	-28	-4%
		PM	820	777	-43	-5%
4		AM	905	1,015	110	12%

Junction		Network Peak Hour	Vehicle Movements			% Change (- / +)
			2026 Base	2026 Base + Dev	Increase / Decrease	
	A4226 Port Road, B4265, Tredogan Road, Dragonfly Drive roundabout	PM	1,037	1,059	22	2%
5	Waycock Cross roundabout	AM	2,869	3,501	632	22%
		PM	3,018	3,446	428	14%
6	Sycamore Cross	AM	2,711	2,975	264	10%
		PM	2,920	3,016	96	3%
7	M4 Junction 34 AM Peak	AM	11,525	11,543	18	0%
		PM	11,825	11,844	19	0%
8	M4 Junction 33	AM	13,216	13,295	79	1%
		PM	13,859	13,894	35	0%
9	Culverhouse gyratory roundabout	AM	9,213	9,501	288	3%
		PM	9,904	10,045	141	1%
10	A4050 Port Road, Barry Docks Link Road roundabout	AM	3,128	3,221	93	3%
		PM	3,317	3,326	189	6%
11	B4265, Cowbridge Road roundabout	AM	1,777	1,835	58	3%
		PM	1,826	1,897	71	4%

Table 9.3: Modelled Junctions 2029 AM & PM Peak Percentage Impacts

Junction		Network Peak Hour	Vehicle Movements			% Change (- / +)
			2029 Base	2029 Base + Dev	Increase / Decrease	
1	Northern Site Access roundabout	AM	1,761	2,694	933	53%
		PM	1,875	2,602	727	39%

Junction		Network Peak Hour	Vehicle Movements			% Change (- / +)
			2029 Base	2029 Base + Dev	Increase / Decrease	
2	Holiday Inn Express Roundabout	AM	935	898	-37	-4%
		PM	955	903	-52	-5%
3	Port Road, Porthkerry Road, unnamed road roundabout	AM	811	781	-30	-4%
		PM	828	788	-40	-5%
4	A4226 Port Road, B4265, Tredogan Road, Dragonfly Drive roundabout	AM	947	1,022	75	8%
		PM	1,037	1,070	33	3%
5	Waycock Cross roundabout	AM	2,899	3,532	633	22%
		PM	3,055	3,490	435	14%
6	Sycamore Cross	AM	2,747	2,998	251	9%
		PM	2,959	3,041	82	3%
7	M4 Junction 34 AM Peak	AM	11,704	11,723	19	0%
		PM	12,003	11,998	-5	0%
8	M4 Junction 33	AM	13,442	13,520	78	1%
		PM	14,077	14,114	37	0%
9	Culverhouse gyratory roundabout	AM	9,374	9,658	284	3%
		PM	10,080	10,224	144	1%
10	A4050 Port Road, Barry Docks Link Road roundabout	AM	3,164	3,267	103	3%
		PM	3,168	3,361	193	6%
11	B4265, Cowbridge Road roundabout	AM	1,804	1,856	52	3%
		PM	1,880	1,943	63	3%

9.10 It is general industry knowledge and professional knowledge and judgement that daily vehicle flows can fluctuate by + / - 10% (Guidelines for the Environmental Assessment of Road Traffic,

IEMA 1993). As can be seen from **Table 9.2** and **Table 9.3** the following junctions have a percentage increase greater than 10%:

- Northern Site Access roundabout;
- A4226 Port Road, B4265, Tredogan Road & Dragonfly Drive roundabout; and
- Waycock Cross roundabout.

Therefore, these junctions are considered to have a percentage impact above the fluctuation in the daily average flow and operational modelling has been undertaken.

- 9.11 No further action is proposed for the other eight junctions that were modelled as they are below the daily flow's average fluctuation. However, due to its importance to the highway network the Culverhouse gyratory roundabout has been discussed in further detail.
- 9.12 Additionally, the SEWTM VISUM model predicts that the development will generate no additional vehicles on the link between Sycamore Cross and J34 of the M4 in the AM and PM network peak hours respectively. The number of vehicles using this route may increase if the Pendoylan Link scheme is constructed.

Northern Site Access Roundabout

- 9.13 The northern access for the site will naturally experience the largest percentage increase with the addition of a fourth arm to the roundabout to provide access for the site. In 2026, there will be an increase of 939 vehicle movements in the AM network peak hour, an increase of 54%. An overall increase of 713 vehicle movements in the PM network peak hour is reported, equating to a 38% increase.
- 9.14 In 2029, the AM network peak hour will increase to 933 vehicle movements, an increase of 53%, and an overall increase of 727 vehicle movements in the PM network peak hour is reported, equating to a 39% increase.
- 9.15 The site access is proposed to be refined with a larger roundabout with an Inscribed Circle Diameter (ICD) of 60 metres and increased deflection on the A4226 east and west arm which slow vehicle approach speeds and improve highway safety. A preliminary design of this junction is available at **Appendix J**. Full details of the proposal will be submitted for technical approval at a later stage.
- 9.16 Junction testing at the proposed site access junction was undertaken using the TRL software Junctions 9 ARCADY. An assessment of the 2026 future year with the proposed development has been undertaken. A summary of the results is shown in **Table 9.4**. The full results are attached at **Appendix N**.

Table 9.4: Northern Site Access Roundabout Junction 2026 ARCADY Results

2026 Base						
Arm	AM Peak Hour 07:45 – 08:45			PM Peak Hour 16:30 – 17:30		
	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC
A4226	0.4	2.95	0.28	0.4	2.88	0.28
Port Road West (A4226)	0.7	4.55	0.40	0.6	4.47	0.37
Port Road	0.4	1.74	0.29	0.6	1.88	0.36
Site Access	0.0	0.00	0.00	0.0	0.00	0.00
2026 plus Development						
Arm	AM Peak Hour 07:45 – 08:45			PM Peak Hour 16:30 – 17:30		
	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC
A4226	0.6	3.50	0.36	0.4	3.87	0.31
Port Road West (A4226)	0.7	4.88	0.41	0.9	7.42	0.47
Port Road	1.1	2.63	0.53	0.6	1.97	0.39
Site Access	0.2	3.65	0.18	3.0	13.84	0.75

- 9.17 An ARCADY assessment of the 2029 future year was also undertaken, with a summary of the results provided in **Table 9.5**, with the full results available at **Appendix O**.

Table 9.5: Northern Site Access Roundabout Junction 2029 ARCADY Results

2029 Base						
Arm	AM Peak Hour 07:45 – 08:45			PM Peak Hour 16:30 – 17:30		
	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC
A4226	0.4	3.05	0.29	0.4	2.9	0.28
Port Road West (A4226)	0.7	4.76	0.42	0.6	4.6	0.38
Port Road	0.4	1.79	0.31	0.6	1.9	0.37

2029 Base						
Arm	AM Peak Hour 07:45 – 08:45			PM Peak Hour 16:30 – 17:30		
	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC
Site Access	0.0	0.00	0.00	0.0	0.00	0.00
2029 plus Development						
Arm	AM Peak Hour 07:45 – 08:45			PM Peak Hour 16:30 – 17:30		
	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC
A4226	0.6	3.78	0.38	0.5	3.97	0.32
Port Road West (A4226)	0.8	5.19	0.44	1	7.85	0.49
Port Road	1.3	2.88	0.56	0.7	2.01	0.4
Site Access	0.3	4.24	0.22	3.3	15.12	0.77

- 9.18 The results above show that the proposed junction will operate within capacity during the network peak hours in both future years.
- 9.19 It should be noted, that the SEWTM VISUM model predicted that almost 100% of the development traffic will enter and exit the development site via this access in the network peak hours respectively. A sensitivity test where 50% of the development traffic is assigned to the site access and Port Road has been undertaken and the results for 2029 are shown in **Table 9.6**.

Table 9.6: Northern Site Access Roundabout Junction 2029 ARCADY Results

2029 plus Development (Sensitivity Test)						
Arm	AM Peak Hour 07:45 – 08:45			PM Peak Hour 16:30 – 17:30		
	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC
A4226	0.6	3.69	0.38	0.5	3.96	0.32
Port Road West (A4226)	1.0	5.65	0.51	3.3	14.26	0.77
Port Road	1.3	2.90	0.56	0.7	2.01	0.40
Site Access	0.2	4.66	0.13	0.7	6.0	0.40

- 9.20 The results indicate that the proposed junction will operate within capacity in 2029 with a 50% split of development traffic between Port Road and the site access arms.

Southern Site Access Roundabout

- 9.21 This existing roundabout, which currently serves the Holiday Inn Express, will provide a secondary access to the development. On-site observations indicate that the junction is operating well within its design capacity with no sustained queuing. The SEWTM model has assigned only a small amount of development traffic to this junction; however, even if a larger percentage of the development traffic were to enter and exit the site via this junction, the junction would continue to operate within capacity.

A4226 Port Road, B4265, Tredogan Road & Dragonfly Drive roundabout

- 9.22 It is reported that there will be an increase of 110 vehicle movements in the 2026 AM network peak which equates to a 12% increase. **Table 9.7** details the results of the ARCADY assessment for this junction. The full results are at **Appendix P**.

Table 9.7: A4226 Port Road, B4265, Tredogan Road & Dragonfly Drive Roundabout Junction 2026 ARCADY Results

2026 Base						
Arm	AM Peak Hour 07:45 – 08:45			PM Peak Hour 16:30 – 17:30		
	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC
A4226	0.3	2.59	0.24	0.4	2.71	0.30
Tredogan Road (S) / Airport	0.0	2.44	0.01	0.0	2.59	0.03
Dragonfly Drive	0.0	0.00	0.00	0.0	0.00	0.00
B4265	0.3	2.64	0.24	0.3	2.55	0.23
Tredogan Road (N)	0.0	2.29	0.04	0.1	2.28	0.05
2026 plus Development						
Arm	AM Peak Hour 07:45 – 08:45			PM Peak Hour 16:30 – 17:30		
	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC

2026 Base						
Arm	AM Peak Hour 07:45 – 08:45			PM Peak Hour 16:30 – 17:30		
	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC
A4226	0.3	2.49	0.23	0.5	2.88	0.34
Tredogan Road (S) / Airport	0.0	2.70	0.02	0.0	2.67	0.03
Dragonfly Drive	0.0	0.00	0.00	0.0	0.00	0.00
B4265	0.4	2.79	0.30	0.3	2.44	0.20
Tredogan Road (N)	0.0	2.34	0.04	0.0	2.23	0.04

9.23 An ARCADY assessment of the 2029 future year was also undertaken, with a summary of the results provided in **Table 9.8**, with the full results available at **Appendix Q**.

Table 9.8: A4226 Port Road, B4265, Tredogan Road & Dragonfly Drive Roundabout Junction 2029 ARCADY Results

2029 Base						
Arm	AM Peak Hour 07:45 – 08:45			PM Peak Hour 16:30 – 17:30		
	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC
A4226	0.4	2.69	0.26	0.4	2.75	0.31
Tredogan Road (S) / Airport	0.0	2.87	0.02	0.0	2.62	0.04
Dragonfly Drive	0.0	0.00	0.00	0.0	0.00	0.00
B4265	0.3	2.65	0.26	0.3	2.55	0.23
Tredogan Road (N)	0.0	2.33	0.04	0.1	2.28	0.05
2029 plus Development						
Arm	AM Peak Hour 07:45 – 08:45			PM Peak Hour 16:30 – 17:30		

2029 Base						
Arm	AM Peak Hour 07:45 – 08:45			PM Peak Hour 16:30 – 17:30		
	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC
	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC
A4226	0.3	2.55	0.24	0.5	2.92	0.35
Tredogan Road (S) / Airport	0.0	2.74	0.02	0.0	2.69	0.04
Dragonfly Drive	0.0	0.00	0.00	0.0	0.00	0.00
B4265	0.5	2.89	0.32	0.3	2.47	0.21
Tredogan Road (N)	0.0	2.41	0.04	0.0	2.23	0.04

- 9.24 As can be seen this junction will continue to operate within capacity during the network peak hours in the future assessment years of 2026 and 2029.

Waycock Cross roundabout

- 9.25 The Waycock Cross roundabout will also have an increase to the vehicle flow in the AM and PM network peak hours. In 2026, there will be an increase of 632 vehicle movements in the AM network peak hour, an increase of 22%. The PM network peak hour will have a 14% increase, with an increase of 428 vehicle movements reported.
- 9.26 In 2029 the vehicle flows remain similar to those in 2026. There will be an increase of 633 vehicle movements in the AM network peak hour, an increase of 22%. The PM network peak hour will have a 14% increase, with an increase of 435 vehicle movements reported.

Table 9.9 shows the 2017 ARCADY results taken from the Five Mile Lane Transport Assessment for the existing roundabout and the proposed improvement scheme.

Table 9.9: Five Mile Lane Transport Assessment ARCADY Results

TA Base – Using Existing Geometries						
Arm	AM Peak Hour 07:45 – 08:45			PM Peak Hour 16:30 – 17:30		
	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC
A4226 Waycock Road	2.16	16.88	0.69	3.28	20.76	0.78
A4226 Port Road West (E)	2.22	9.09	0.69	1.97	8.28	0.67
Pontypridd Road	1.08	5.60	0.52	1.20	5.93	0.55
A4226 Port Road West (W)	71.87	201.43	1.12	3.74	15.01	0.80
TA 2017 Base (Do Something) – Using the Proposed Geometry Improvement from TA						
Arm	AM Peak Hour 07:45 – 08:45			PM Peak Hour 16:30 – 17:30		
	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC
A4226 Waycock Road	1.06	5.50	0.52	0.97	4.50	0.49
A4226 Port Road West (E)	1.92	9.69	0.66	1.82	8.98	0.65
Pontypridd Road	1.22	6.12	0.55	1.51	7.02	0.60
A4226 Port Road West (W)	31.56	93.67	1.02	2.69	10.71	0.73

9.27 **RPS have undertaken geometry measurements of the improvement scheme and input the 2017 flows. The following differences between the Five Mile Lane Transport Assessment and the RPS results are noted:**

- AM Peak

- A4226 Waycock Road (Five Mile Lane) Max RFC decreases by 0.07 with the RPS measurements;
 - A4226 Port Road West (E) Max RFC decreases by 0.30 with the RPS measurements; and
 - A4226 Port Road West (W) Max Queue increases by 47.14 vehicles, with the Max Delay increasing by 127.69 seconds.
- PM Peak
 - A4226 Port Road West (E) Max RFC decreases by 0.26 with the RPS measurements; and
 - A4226 Port Road West (W) increases by 0.08 with the RPS measurements.

9.28 **Table 9.10** details the results of the ARCADY assessment for this junction which is undertaken for the improved junction associated with the Five Mile Lane scheme using RPS geometry. The full results are at **Appendix R**.

Table 9.10: Waycock Cross Roundabout Junction 2026 ARCADY Results

2026 Base						
Arm	AM Peak Hour 07:45 – 08:45			PM Peak Hour 16:30 – 17:30		
	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC
Port Road West	24.6	85.41	1.01	8.0	31.88	0.90
Waycock Road (Five Mile Lane)	1.8	8.01	0.65	4.0	13.85	0.81
Port Road West (e)	0.6	5.18	0.38	0.7	5.49	0.40
Pontypridd Road	1.7	7.07	0.63	1.7	7.43	0.64
2026 Base plus Development						
Arm	AM Peak Hour 07:45 – 08:45			PM Peak Hour 16:30 – 17:30		
	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC
Port Road West	67.0	188.65	1.11	229.0	682.02	1.34
Waycock Road (Five Mile Lane)	4.8	16.61	0.84	4.2	15.11	0.81

Port Road West (e)	2.2	11.85	0.70	0.8	5.77	0.44
Pontypridd Road	7.0	29.41	0.89	1.5	6.94	0.60

- 9.29 In the 2026 base situation (including SEWTM committed development) the improved roundabout will operate with a maximum RFC of 1.01 in the AM network peak hour and 0.90 in the PM network peak hour on the Port Road West arm. All other arms operate within capacity.
- 9.30 In 2026 with the development traffic added the RFCs on the Port Road West arm increase to 1.11 and 1.34 in the AM and PM network peak hours respectively. All other arms continue to operate within capacity.
- 9.31 An assessment of the 2029 future year was also undertaken, with a summary of the results provided in **Table 9.11**, with the full results available at **Appendix S**.

Table 9.11: Waycock Cross Roundabout Junction 2029 ARCADY Results

2029 Base						
Arm	AM Peak Hour 07:45 – 08:45			PM Peak Hour 16:30 – 17:30		
	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC
Port Road West	71.4	226.24	1.01	8.0	31.88	0.90
Waycock Road (Five Mile Lane)	1.8	7.95	0.65	4.4	14.99	0.82
Port Road West (e)	0.6	5.19	0.38	0.7	5.72	0.41
Pontypridd Road	3.7	12.65	0.79	1.9	8.02	0.66
2029 Base plus Development						
Arm	AM Peak Hour 07:45 – 08:45			PM Peak Hour 16:30 – 17:30		
	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC	Max Queue (Vehicles)	Max Delay (Seconds)	Max RFC
Port Road West	74.7	209.08	1.13	240.7	715.54	1.35
Waycock Road (Five Mile Lane)	5.1	17.43	0.84	4.4	15.68	0.82

Port Road West (e)	2.4	12.56	0.71	0.8	5.94	0.46
Pontypridd Road	8.2	34.29	0.91	1.6	7.18	0.61

- 9.32 In the 2029 base situation (including SEWTM committed development) the improved roundabout will operate with a maximum RFC of 1.01 in the AM network peak hour and 0.90 in the PM network peak hour on the Port Road West arm. All other arms operate within capacity.
- 9.33 In 2029 with the development traffic added the RFCs on the Port Road West arm increase to 1.13 and 1.35 in the AM and PM network peak hours respectively. All other arms continue to operate within capacity. Discussions with TVoGC, in respect of suitable mitigation, will be undertaken.

Culverhouse Gytratory Roundabout

- 9.34 There is an overall increase of 284 movements through the junction during the AM network peak hour, which equates to an increase of 3%. The overall increase of vehicle movements during the PM network peak hour is modelled to be 140 vehicle movements, equating to only a 1% increase.
- 9.35 Increases are shown for the A48 west arm, which is considered commensurate as this is the expected route to and from the site. The increase of movements for this arm is 10%. Therefore, as the increase is within the expected daily flow fluctuation no operational capacity modelling has been undertaken.

Sycamore Cross Signalised Staggered Junction

- 9.36 There is an overall increase of 264 movements through the junction during the AM network peak hour, which equates to an increase of 10%. The overall increase of vehicle movements during the PM network peak hour is modelled to be 96 vehicle movements, equating to only a 3% increase. As the increase of movements at the junction is 10% and within the expected daily flow fluctuation no operational capacity modelling has been undertaken.
- 9.37 Increases from the A48 East and A48 West to the A4226 (Five Mile Lane) are reported at 65% and 30% respectively.

Construction

- 9.38 The development has been estimated to generate 478 two-way HGV movements on a weekday when operational. Given that the majority of the development is for large employment units it is not envisaged that the weekday HGV numbers will be higher than those estimated for the operational phase of the development. Therefore, no impact assessment has been undertaken for the construction phase.

Summary

- 9.39 Three junctions which have been reported to have an increase in daily average traffic increases greater than 10% have been assessed. The assessments based on future years of 2026 and 2029 show that the proposed northern site access and the existing A4226/B4265/Tredogan

Road/Dragonfly Drive junction will operate within their design capacity. The Waycock Cross roundabout will operate over its design capacity but within its theoretical capacity in the AM network peak hour and over its theoretical capacity in the PM network peak hour. Discussions with TVoGC will be held during the application process to discuss potential mitigation.

10 TRANSPORT IMPLEMENTATION STRATEGY

Site Access and Sustainable Transport Proposals

10.1 Transport proposals have been developed to maximise the potential of sustainable travel modes other than private car journeys, limiting the potential traffic impacts that may arise from the development. The proposals consist of the following measures:

- Framework Travel Plan (FTP);
- Walking and Cycling Strategy;
- Public Transport Strategy;
- Vehicular Access Strategy; and
- Car Parking Management Plan (CPMP).

Draft Framework Travel Plan

10.2 An FTP for the scheme has been developed in accordance with the appropriate National and Local policy guidance. The FTP has been written in accordance with a Scoping Report submitted to TVoGC and TfW in November 2018 and April 2019. The plan will be implemented site-wide prior to occupation.

10.3 Aims and objectives set out within the FTP will be achieved through the implementation of measures, initiatives and marketing that are aimed at decreasing single occupancy vehicle use and increasing use of sustainable travel modes. The FTP should be read in conjunction with this Transport Assessment.

Walking and Cycling Strategy

10.4 High priority has been given to walking and cycling within the design of the proposed illustrative masterplan. This is evidenced by the proposed footway links, cycle links onto Port Road, a cycle link onto NCN 88 and the shared footway / cycleway. Facilities will also be provided within the development to encourage walking and cycling such as showers and changing rooms.

10.5 Assessment of the walking and cycling routes has been undertaken and suggested mitigation is to be discussed with TVoGC.

Cycle Parking

10.6 Cycle parking will be provided in accordance with TVoGC Parking Standards SPG, with the relevant standards available to view in **Table 4.2**. Cycle parking is expected to be provided above the suggested levels in order to maximise the number of employees that may cycle to work.

Public Transport Strategy

Bus Services

- 10.7 As set out in **Chapter 3** the site is currently accessible via a number of bus services from key destinations of Rhoose, Barry, Llantwit Major, Bridgend and Cardiff. The nearest existing bus stops to the site are within reasonable walking distance and the two nearest rails stations are within average distance for commuting by cycle.
- 10.8 The 303 bus service is operated by New Adventure Travel and has a frequency of one service inbound and outbound per hour between Bridgend and Barry. The existing journey time from Bridgend to the site is 78 minutes, with the journey time from Barry to the site 18 minutes. As previously proposed in **Chapter 4**, improvements are to be made to this service to improve frequency and accessibility to the site.
- 10.9 The 905 service is also operated by New Adventure Travel and operates a looped route between Rhoose (CIA) Rail Station and Cardiff Airport, with an hourly frequency. The journey time between the rail station and the site is approximately five minutes. However, we have been advised that the 905 service could be retired, with the travel load picked up by the 303 service.
- 10.10 Cardiff Bus operate the X91 service between Cardiff and Llantwit Major. The route has a frequency of one service inbound and outbound every two hours. The current journey time between Cardiff and the site is 35 minutes, with Llantwit Major to the site taking 27 minutes.
- 10.11 The T9 service is operated by TransCymru, with a frequency of every 20 minutes throughout the day. The journey time from the Cardiff to the site is 25 minutes, with the return journey 40 minutes.
- 10.12 Chosen external bus stops within the vicinity of the development will be upgraded to provide shelter, seating, raised kerbs and timetable information. Pedestrian and cycle access will also be provided to these stops from the site.

Train Services

- 10.13 Barry Rail Station benefits from frequent train services from key origin destinations. The suggested pedestrian infrastructure mitigation would provide improved routes to and from the station and the development for those walking and cycling.
- 10.14 Rhoose (CIA) Rail Station currently has a frequency of one arrival and departure per hour. This is set to increase to two departures per hour, with the potential for further increased frequency in the AM and PM peak hours.
- 10.15 Walking and cycling routes will be provided from the development that connect onto existing walking and cycling infrastructure. It is also proposed that mitigation is provided for walking routes used to access train services at Rhoose (CIA) and Barry rail stations, which will upgrade existing infrastructure to and from the site.

Vehicular Parking Strategy

- 10.16 Vehicle parking will be provided generally in line with TVoGC Parking Standards SPG document. However, parking will be suppressed to encourage travel by alternative, sustainable modes. The

exact number of parking spaces will be agreed with TVoGC at the reserved matters stage of the application.

- 10.17 Parking Management plans will be introduced to restrict parking levels. Schemes such as prioritising parking spaces for those that car-share and electric vehicles will be implemented.
- 10.18 Traffic Regulation Orders (TROs), such as double yellow lines, will be implemented along the internal spine and access roads to prevent overspill parking.

Development Compliance

- 10.19 The development will comply with the policies, plans, notes and acts set out within **Chapter 2**. The site is allocated for Employment Allocation and Strategic Development, is well located in relation to public transport opportunities (two rail stations, existing bus services) and can serve the economic needs of the Vale of Glamorgan whilst creating a strong, happy working environment.
- 10.20 The development has been planned with street design as a key element. The importance of pedestrian and cycling infrastructure will be incorporated within the detailed design, with a shared footway / cycleway routing along the internal spine road linking onto the existing infrastructure providing access to Rhooose and Barry.
- 10.21 Improvements to existing transport infrastructure and provision of future infrastructure, such as crossing locations and new walking and cycling routes are suggested to be provided as part of mitigation for the scheme. Bus penetration will be provided through diversion of an existing service, with bus stops internal to the site located at appropriate walking distances.
- 10.22 Public transport provision will be increased with more frequent services for both bus and train services. Increases to the services will be beneficial not only to the development but to local communities. This will also be beneficial to local communities.
- 10.23 Traffic management and parking restrictions will be implemented to reduce the number of single occupancy vehicle trips made to and from the site. Electric charging points will be provided with emphasis on tackling the causes of climate change. Developers will be encouraged to have electric fleet vehicles, reducing the need for private car journeys and further encouraging the reduction of carbon production.
- 10.24 A Framework Travel Plan (FTP) will be implemented site-wide, with a Site-Wide Travel Plan Co-ordinator (SWTPC) and Travel Plan Co-ordinators (TPCs) for the individual businesses within the development compulsory. The FTP will be written in line with TVoGC's Draft Travel Plan guidance document and will inform future employees of the sustainable travel choices available to access the development, measures for healthier living that are to be provided and accessibility, timetables and discounts for public transport. Monitoring reports of the FTP will be submitted to TVoGC and TfW by the SWTPC annually. Changes to the way the FTP is marketed, and the measures promoted within it will then be examined and alterations could be made if needed.

Summary

- 10.25 The development complies with the National and Local policies and provides a suitable Transport Implementation Strategy.

11 SUMMARY AND CONCLUSIONS

Summary

- 11.1 This Transport Assessment has been prepared by RPS on behalf of Legal & General (Strategic Land) Ltd to support the outline planning application to be submitted for the employment development at land east of Cardiff International Airport, Rhooose. This TA has been written subject to two Scoping Notes submitted to TVoGC and TfW and the planning submission seeks outline planning permission with all matters reserved except for access.
- 11.2 The site forms part of the wider Cardiff Airport - St. Athan Enterprise Zone, which is allocated within the Vale of Glamorgan Local Development Plan 2011 – 2026 (adopted June 2017). The Zone is allocated for 77.4ha of B1, B2 and B8 employment uses and an extension to Porthkerry Country Park.
- 11.3 The proposed development is envisaged to be a mix of B1, B2 and B8 land uses (plus ancillary development). The scheme will deliver a sustainable development through walking and cycling infrastructure, a public transport strategy and a strong Framework Travel Plan.
- 11.4 The development will comply with National and Local policies. The site is well located in relation to public transport provision, with future improvements benefiting those accessing the site and the local community. Walking and cycling infrastructure will be an integral part of the development and street design will be implemented at the forefront of the detailed design stage.
- 11.5 The scheme will include measures to promote sustainability, providing walking and cycling links to the existing infrastructure and provision of a spine road that enables buses to penetrate the site. Improvements to bus services, through discussion with the Local Highway Authority and the bus operators, will be explored.
- 11.6 A general outline of the development proposals has been provided. The transport issues for the development such as potential mitigation, and detailed access design will be in line with policy and will be determined at the reserved matters and detailed design stage of the application.
- 11.7 The development will generally follow the guidance set out in TVoGC Parking Standards SPG when determining parking levels for cars and cycles. Car parking is likely to be underprovided as a measure to decrease the number of SOV trips to the development, with cycle parking likely to be overprovided. These are measures to increase the site's sustainability.
- 11.8 The development will provide walking and cycling infrastructure, improve existing public transport infrastructure and has the potential to mitigate existing pedestrian infrastructure. The additions brought forward by this development will benefit by the local community and employees.
- 11.9 Trip generation for the network peak hour, calculated using the TRICS database, estimated that there will be 1023 and 895 two-way vehicle movements generated by the development in the AM and PM network hours respectively.
- 11.10 An assessment of the impact of the traffic generated by the development using the SEWTM VISUM model of 11 junctions has been undertaken by Norman Rourke Pryme. The modelling suggested that operational assessments should be undertaken at three junctions to determine the transport impact at these locations. The assessments based on future years of 2026 and 2029 show that the proposed northern site access and the existing A4226/B4265/Tredogan

Road/Dragonfly Drive junction will operate within their design capacity. The Waycock Cross roundabout will operate over its design capacity but within its theoretical capacity in the AM network peak hour and over its theoretical capacity in the PM network peak hour. Discussions with TVoGC will be held during the application process to discuss potential mitigation.

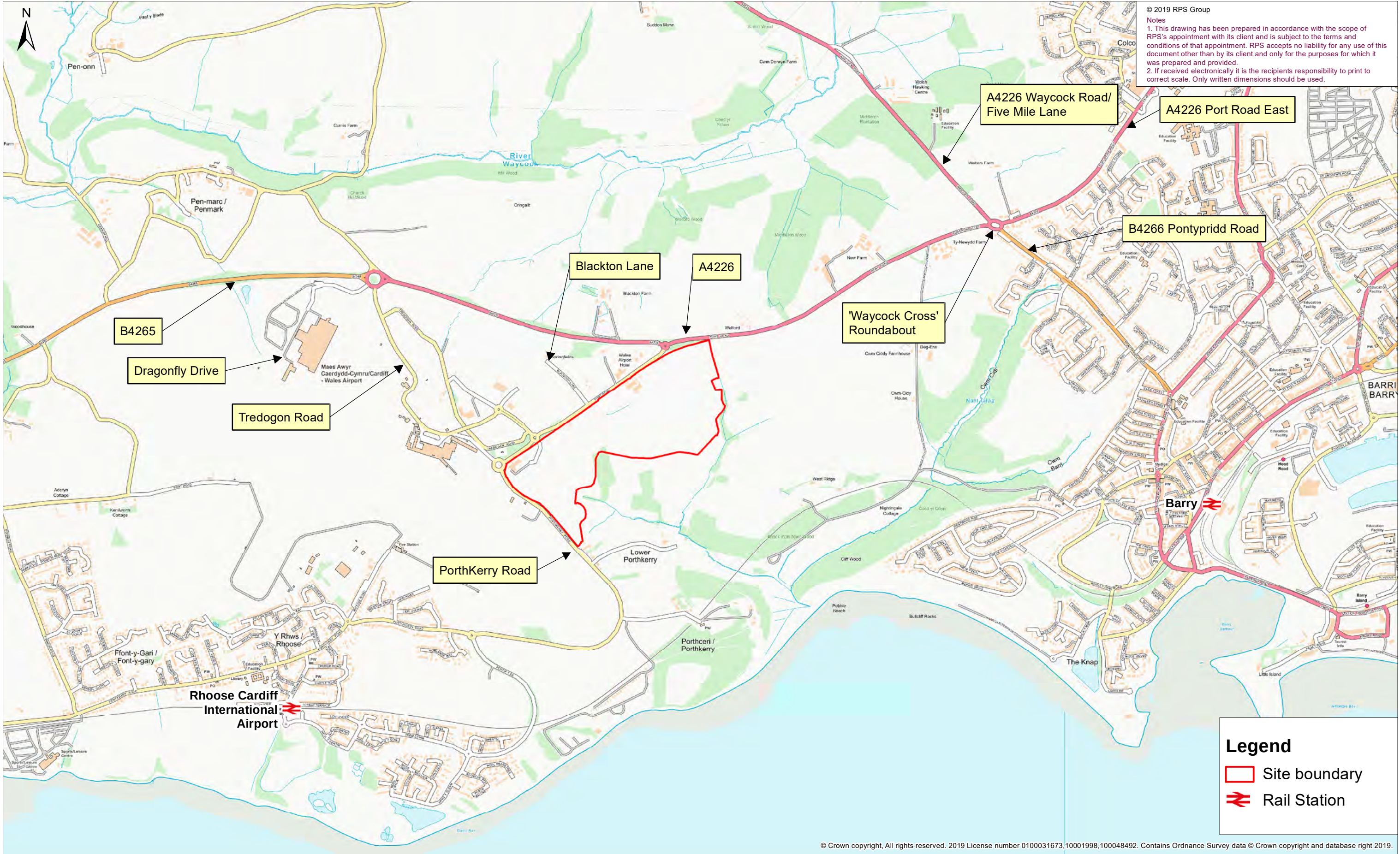
- 11.11 The Transport Implementation Strategy for the development is considered to be appropriate with the proposals and compliant with the National and Local policies set out by the Welsh Government and TVoGC.

Conclusions

- 11.12 This Transport Assessment concludes that the proposed development has suitable access arrangements that can be accommodated without the detriment to the existing highway safety or the operation of the local highway network. A strong Framework Travel Plan will be implemented site-wide which will allow for sustainable travel to and from the development.
- 11.13 It is concluded that there are no transportation reasons why the development proposal should not be allowed.

Figures

Figure 1 – Site Location Plan



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Figure Number				Rev
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Project	Model Farm
Title	Site Location Plan

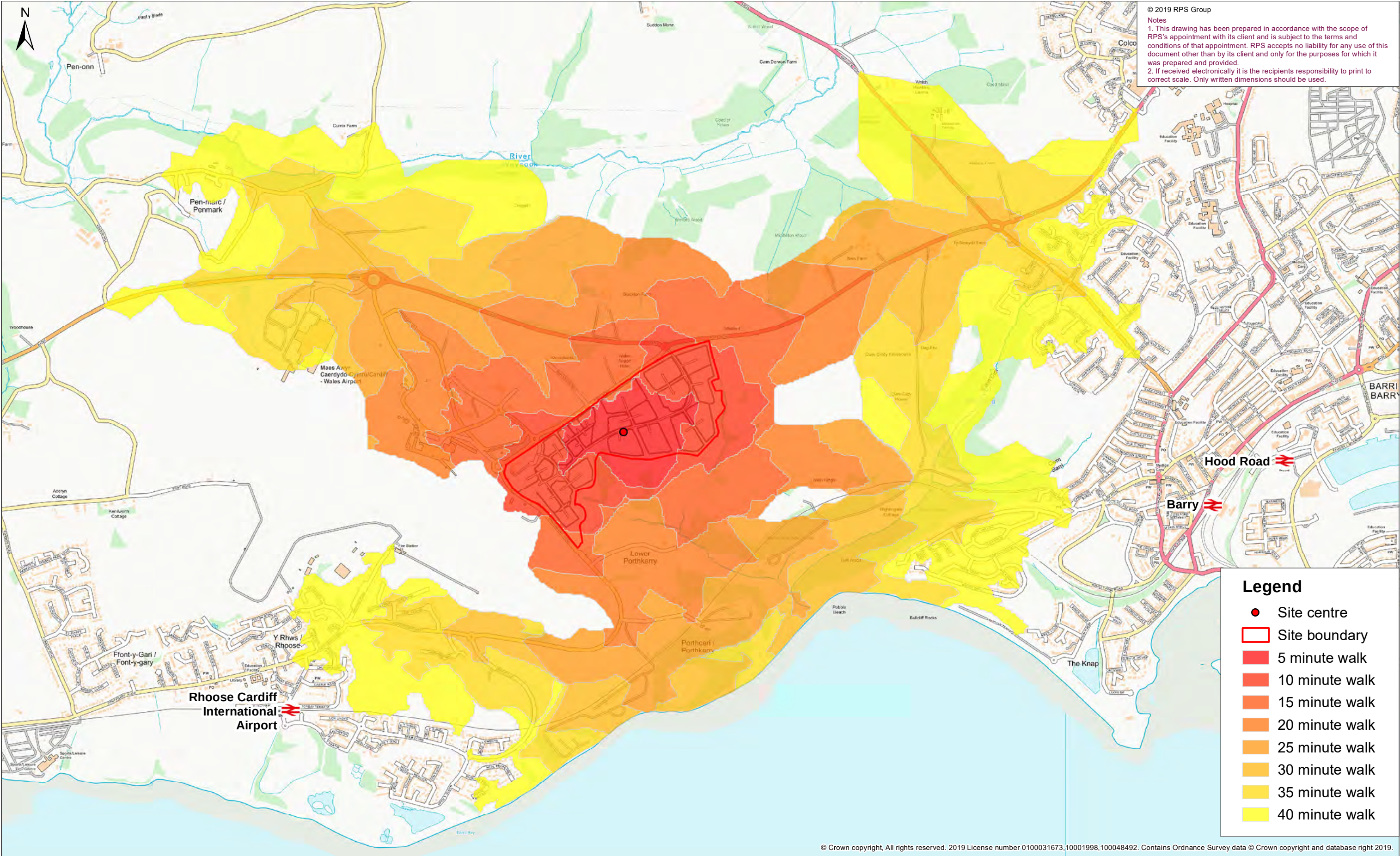
Status	Drawn By	PM/Checked By
DRAFT	BG	CM
Project Number	Scale @ A3	Date Created
JNY9624	NTS	MAY 2019

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Figure 2 – Existing Walking and Cycling Infrastructure

Figure 3 – Central Walk Isochrone



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- Legend**
- Site centre
 - Site boundary
 - 5 minute walk
 - 10 minute walk
 - 15 minute walk
 - 20 minute walk
 - 25 minute walk
 - 30 minute walk
 - 35 minute walk
 - 40 minute walk

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Project Model Farm

Title Central Walk Isochrone

0 265 530 m

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Project Number
JNY9624

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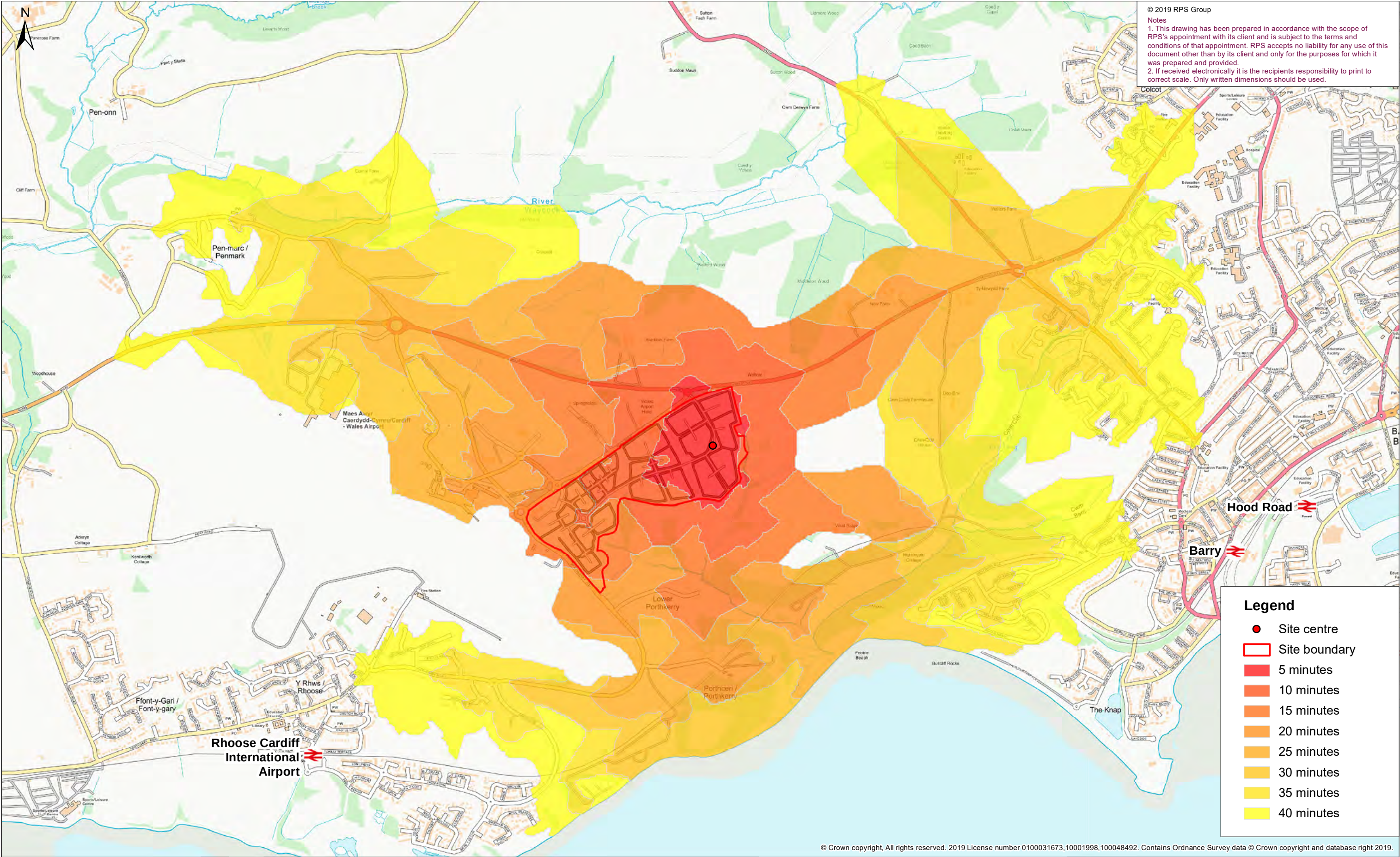
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Figure 4 – Eastern Walk Isochrone



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- Legend**
- Site centre
 - Site boundary
 - 5 minutes
 - 10 minutes
 - 15 minutes
 - 20 minutes
 - 25 minutes
 - 30 minutes
 - 35 minutes
 - 40 minutes

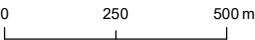
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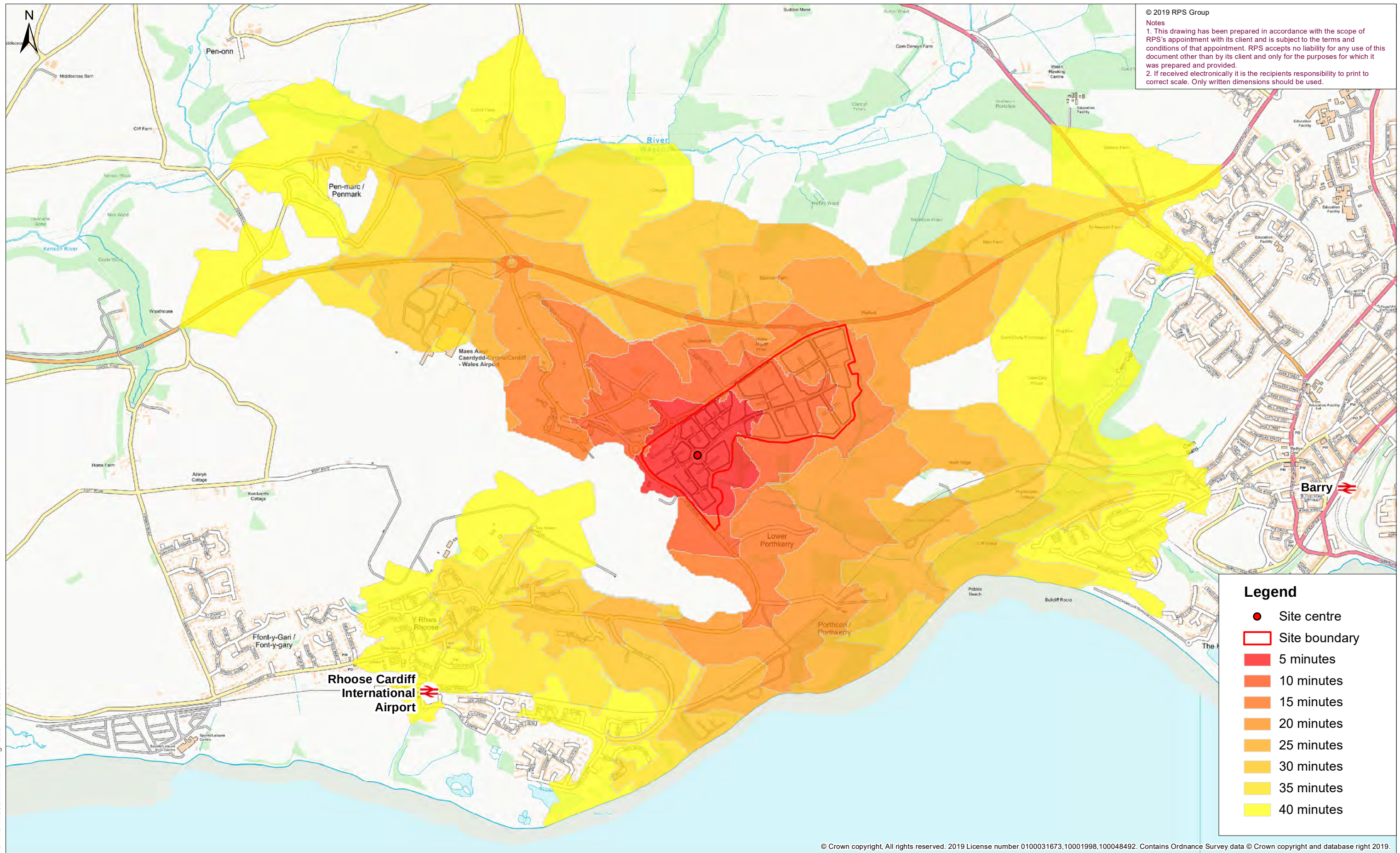
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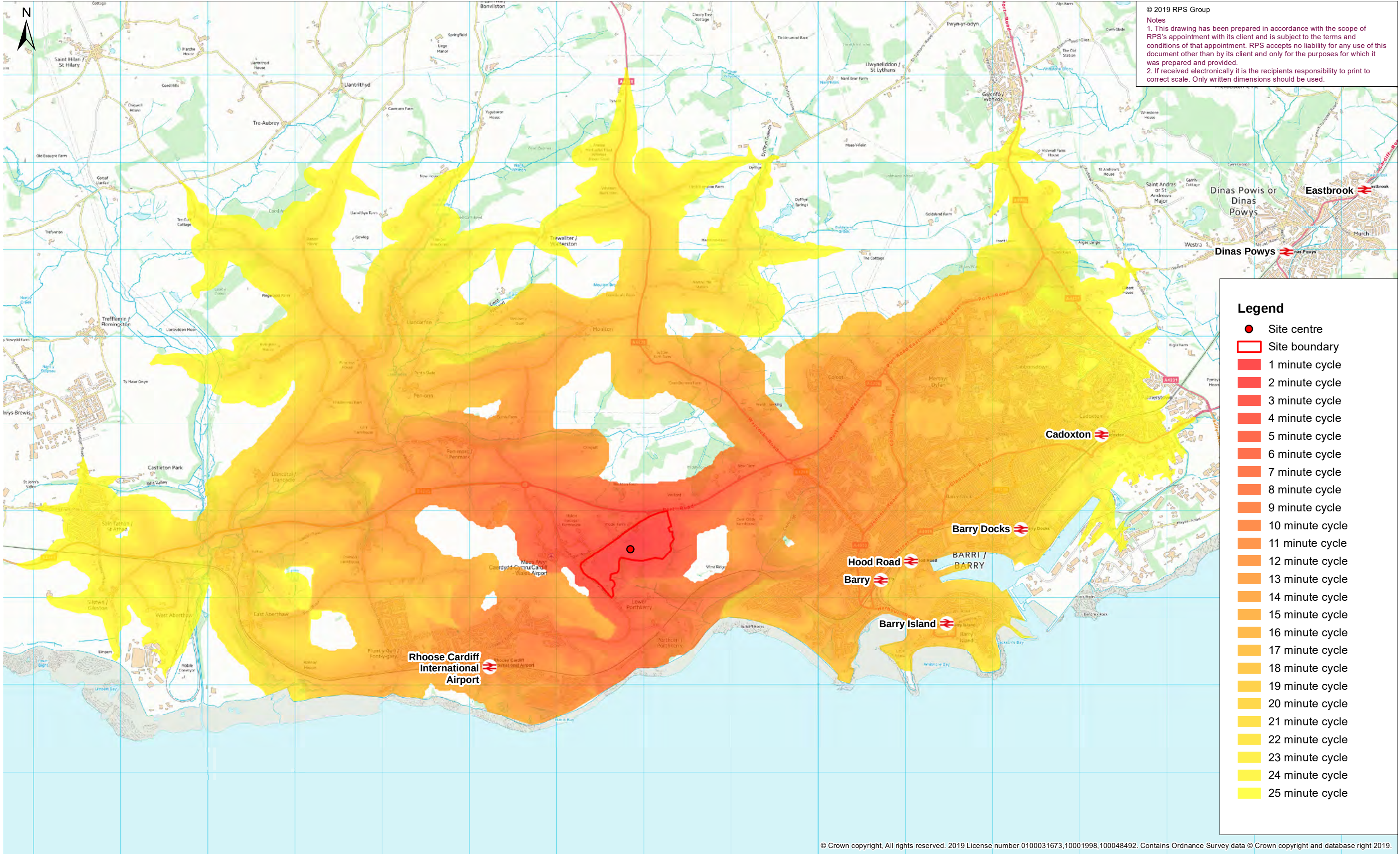


Figure 5 – Western Walk Isochrone



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Figure 6 – Cycle Isochrone



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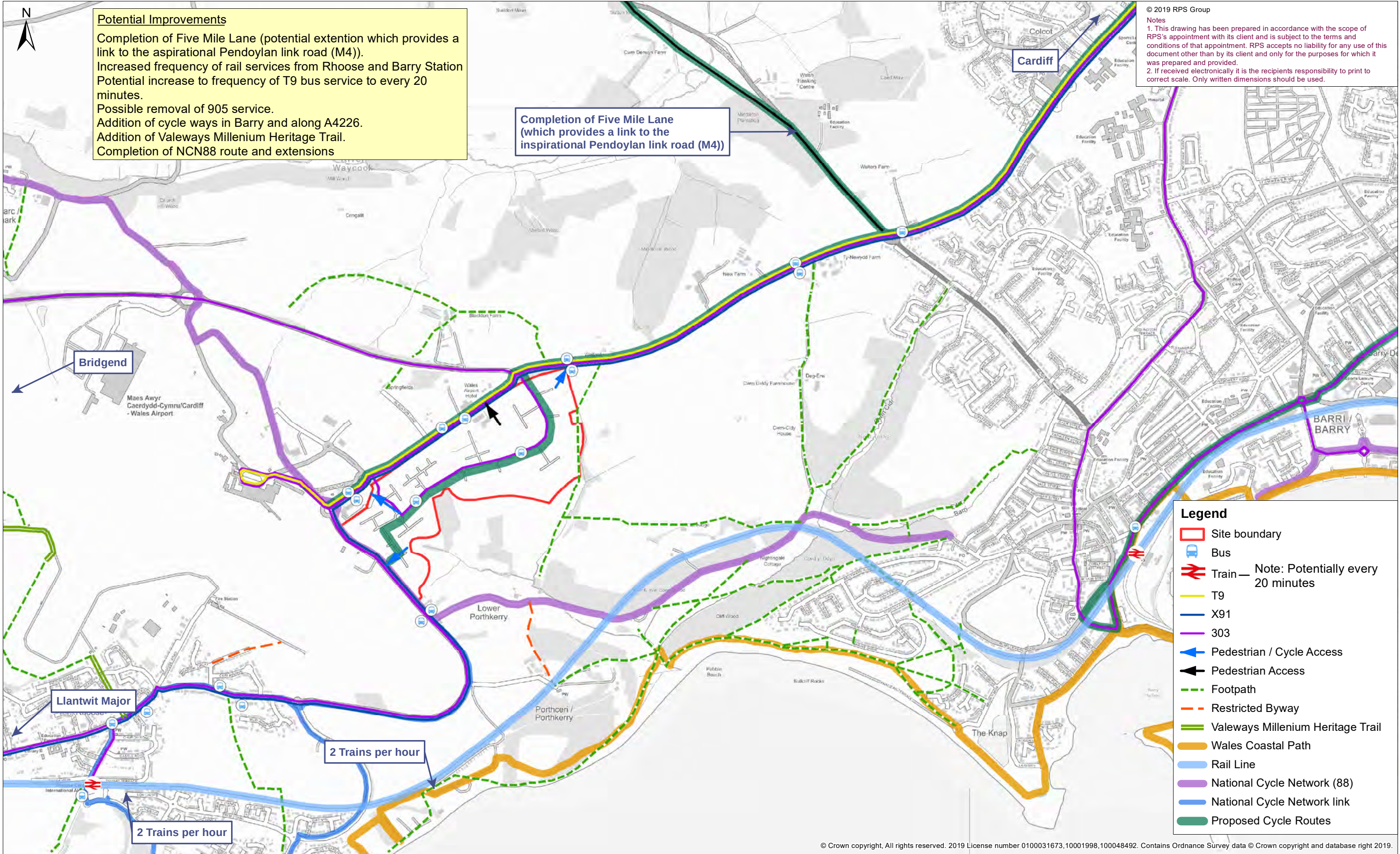
Legend

- Site centre
- Site boundary
- 1 minute cycle
- 2 minute cycle
- 3 minute cycle
- 4 minute cycle
- 5 minute cycle
- 6 minute cycle
- 7 minute cycle
- 8 minute cycle
- 9 minute cycle
- 10 minute cycle
- 11 minute cycle
- 12 minute cycle
- 13 minute cycle
- 14 minute cycle
- 15 minute cycle
- 16 minute cycle
- 17 minute cycle
- 18 minute cycle
- 19 minute cycle
- 20 minute cycle
- 21 minute cycle
- 22 minute cycle
- 23 minute cycle
- 24 minute cycle
- 25 minute cycle

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					Client Legal and General Capital Project Model Farm Title Cycle Isochrone	05001,000 m	Status DRAFT Project Number JNY9624	Drawn By CR Scale @ A3 NTS	PM/Checked By CM Date Created MAY 2019	20 Western Avenue, Milton Park, Abingdon, Oxfordshire, OX14 4SH T: +44(0)1235 821 888 E: rps@rpsgroup.com MAKING COMPLEX EASY	
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Figure 7 – Potential Transport Infrastructure



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- Legend**
- Site boundary
 - Bus
 - Train — Note: Potentially every 20 minutes
 - T9
 - X91
 - 303
 - Pedestrian / Cycle Access
 - Pedestrian Access
 - Footpath
 - Restricted Byway
 - Valeways Millenium Heritage Trail
 - Wales Coastal Path
 - Rail Line
 - National Cycle Network (88)
 - National Cycle Network link
 - Proposed Cycle Routes

1	Text updated to potential differences	BG	AS 05/19
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Project Model Farm

Title Potential Transport Infrastructure

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Figure 8 – Strategic Modelling Junction Locations