

TRANSPORT ASSESSMENT

ABP DevCo

The Mole, Barry

May 2023

Transport Assessment V4

Contents

1	Introduction	1
2	Existing Accessibility.....	4
3	Policy Review	23
4	Development Proposals	30
5	Trip Generation.....	37
6	Distribution & Assignment.....	48
7	Traffic Effect	52
8	Transport Implementation Strategy	55
9	Summary and Conclusion.....	57

Figures

Figure 2.1	– Site Location
Figure 2.2	– MSOA The Vale of Glamorgan 015
Figure 2.3	– Selected Local Facilities
Figure 2.4	– Restrictions in the vicinity of the Site
Figure 2.5	– 10, 20 and 30 Minute Indicative Walking Isochrones
Figure 2.6	– 10, 20 and 30 Minute indicative Cycling Isochrones
Figure 2.7	– Local Bus Routes
Figure 2.8	– Local Train Stations
Figure 2.9	– Barry Docks Transport Interchange (south)
Figure 2.10	– Collision Locations
Figure 3.1	– Transport Hierarchy (Active Travel Act Guidance 2021)
Figure 3.2	– Wales Transport Strategy Priorities
Figure 3.3	– Active Travel Guidance Table 4.1
Figure 4.1	– Site Layout
Figure 6.1	– Marina and Office Distribution
Figure 6.2	– Residential Distribution Routes

Appendices

Appendix A	– Transport Assessment Scoping Note
Appendix B	– Barry Docks Station Interchange Layout
Appendix C	– Site Masterplan
Appendix D	– Vectos Drawings
Appendix E	– TRICS Output Reports
Appendix F	– Peak Hour: Traffic Flow Diagrams
Appendix G	– ARCADY and LINSIG Outputs

1 Introduction

Overview

- 1.1 This Transport Assessment (TA) has been prepared by Vectos, part of SLR, on behalf of ABP Dev Co to set out transport and highway matters associated with the proposed redevelopment of land referred to as The Mole, Barry, Vale of Glamorgan, CF62 5BR. The Planning reference is 2023/00051/HYB.
- 1.2 The proposed development relates to a mixed use scheme comprising the following:
 - The creation of a 400-berth marina with floating pontoons, with an associated 520 sqm marina office building which will include facilities for visitors / members and a restaurant.
 - A 2,694 sqm incubator workspace building comprising offices, smart innovation space, break-out space and a café.
 - Residential development comprising 45 x three and four bedroom townhouses and 20 x one and two bedroom apartments with a maximum height of 4 storeys, providing 65 units overall.
 - Access road and car parking.
 - Landscaping and public open space/park.
 - Engineering works to raise the existing ground levels to a minimum of 9.00m AOD in order to mitigate against flood risk.

Site Location

- 1.3 The site comprises circa 7.5 acres of reclaimed land which was constructed as part of the No. 1 Dock in the 19th century, based on 25m foundations. It is bound by the dock on three sides and is connected to Neptune Road and the wider Barry Waterfront development along its western boundary. Part of the site has recently been occupied by the Ocean Water sports Trust (OWT). Access is currently provided from Neptune Road which in turn connects with Ffordd Y Mileniwm and Hood Road via a signal controlled junction.

Site History

- 1.4 The Barry Waterfront area has a significant industrial past following its development as a major coal export centre in the mid-19th Century. In 1884, parliament authorised construction of new docks at Barry as part of a combined dock and railway project that was being promoted by colliery owners from the Rhondda, Ogmore and Llynfi valleys. Construction commenced in November 1884.
- 1.5 The Mole sits within what was known as No.1 Dock, which opened to shipping on 18th July 1889. The Mole peninsula divided the dock into two arms.

Development Background

- 1.6 The Vale of Glamorgan (VoG) Council and Associated British Ports (ABP) have worked together to develop a bid to the Levelling Up Fund (LUF), which would see the creation of a new marina, business incubator, community hub and new homes. The bid has been submitted by VoG with the support of Alun Cairns MP, and also includes the relocation of the Ocean Watersports Trust within the port estate, securing the future of the charity.
- 1.7 The proposals will form a hybrid application. Full planning permission is sought for the engineering works to raise the site levels and outline planning application is sought for associated mixed use development.
- 1.8 The overall vision for the site is to provide a distinctive and high quality mixed use marina. The development will create up to 65 new dwellings with associated public open space. It will provide a choice of housing to meet the growing needs of the area.
- 1.9 A business incubation provision will also form part of the development and may include both office and retail space.
- 1.10 The proposed 400 berth marina and marina services building provide an opportunity to maximise access to the waterfront setting whilst also supporting event space and public open space.

LDP Status

- 1.11 VoG is currently preparing its replacement Local Development Plan (LDP) 2021 – 2036. The current LDP (2011 – 2026) was adopted in June 2017. The site forms part of Policy SP2 – Strategic Site Barry Waterfront which includes the peninsula that extends into the No.1 Dock. The allocation relates to ongoing redevelopment to provide a residential led mixed use community.
- 1.12 The development proposals align with the site allocation in the LDP.

Scoping

- 1.13 This TA has been prepared following pre application engagement with the VoG Council as the highway authority. The Pre App response has been acknowledged where appropriate. A Transport Assessment Scoping Report was issued to VoG on 12/09/2022 and can be found at **Appendix A**.
- 1.14 This TA has been updated to address comments provided by VoG officers and their consultants as part of PAC and the planning application statutory consultation.

Report Structure

1.15 The structure of this TA is as follows:

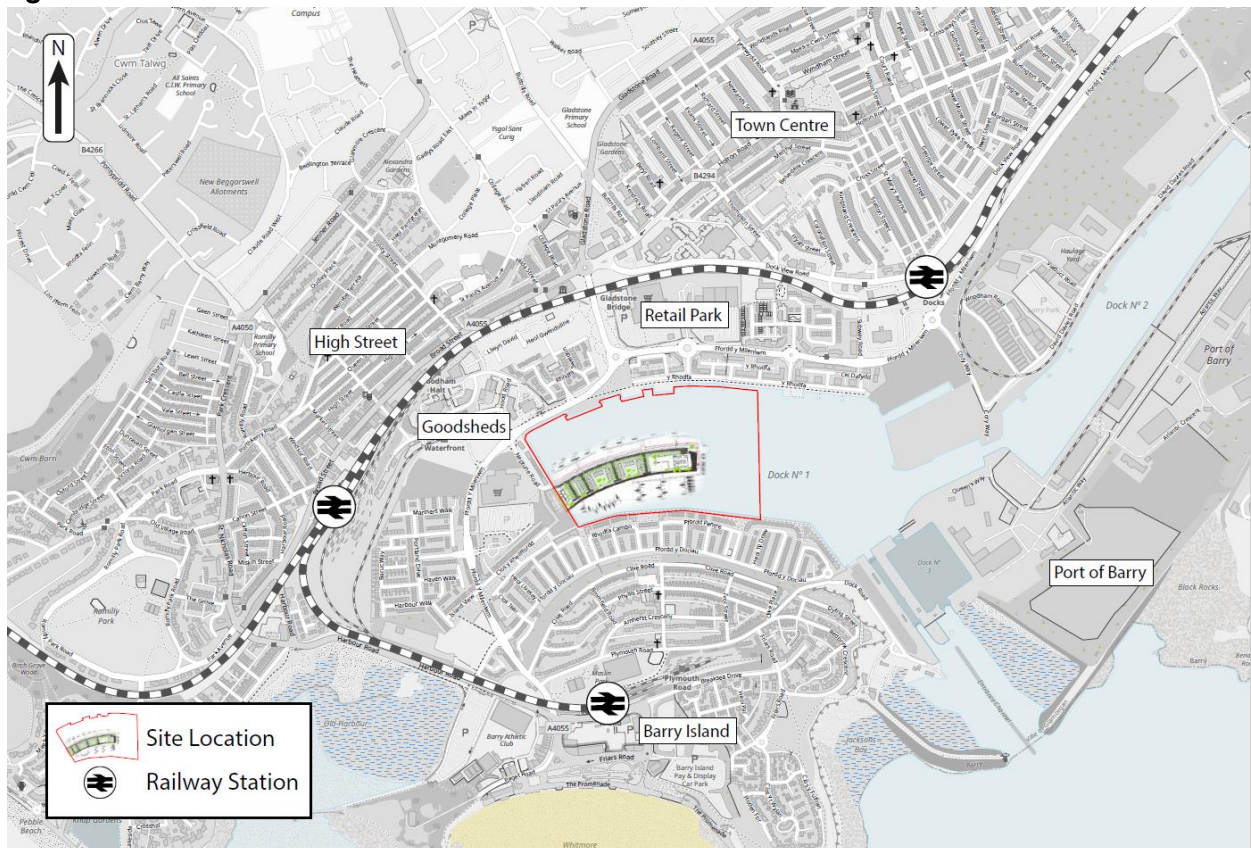
- **Section 2: Existing Accessibility** - examines the current and emerging accessibility of the site;
- **Section 3: Policy Review** - sets out the national and local policy relevant to the development
- **Section 4: Development Proposals** - details the proposals and the anticipated access and operation of the site.
- **Section 5: Trip Generation** – sets out the trip generation methodology for all proposed land uses associated with the development;
- **Section 6: Distribution & Assignment** – sets out the proposed method and scenarios for trips on the highway network;
- **Section 7: Traffic Effect** - sets out the impact of the development on the local highway network
- **Section 8: Transport Implementation Strategy** - sets objectives and targets relating to managing travel demand.
- **Section 9: Summary & Conclusion** – summarises this report.

2 Existing Accessibility

Overview

- 2.1 The site is located to the south of Ffordd Y Mileniwm and east of Neptune Way, and is situated at the western end of No 1 Dock, Barry.
- 2.2 The location and context of the site is shown in **Figure 2.1**.

Figure 2.1 – Site Location



- 2.3 The site comprises circa 7.5 acres of reclaimed land which was constructed as part of the No. 1 Dock in the 19th century. An approximate one acre of land on the eastern side of the site was subject to a six year (unprotected) lease from March 2015 to the OWT, together with a right to access the water from the leased area for the duration of the lease term.
- 2.4 The OWT area of the site is shown in **Photograph 2.1**. The OWT will be moving to a temporary position on the opposite side of the dock ahead of a permanent location being established.

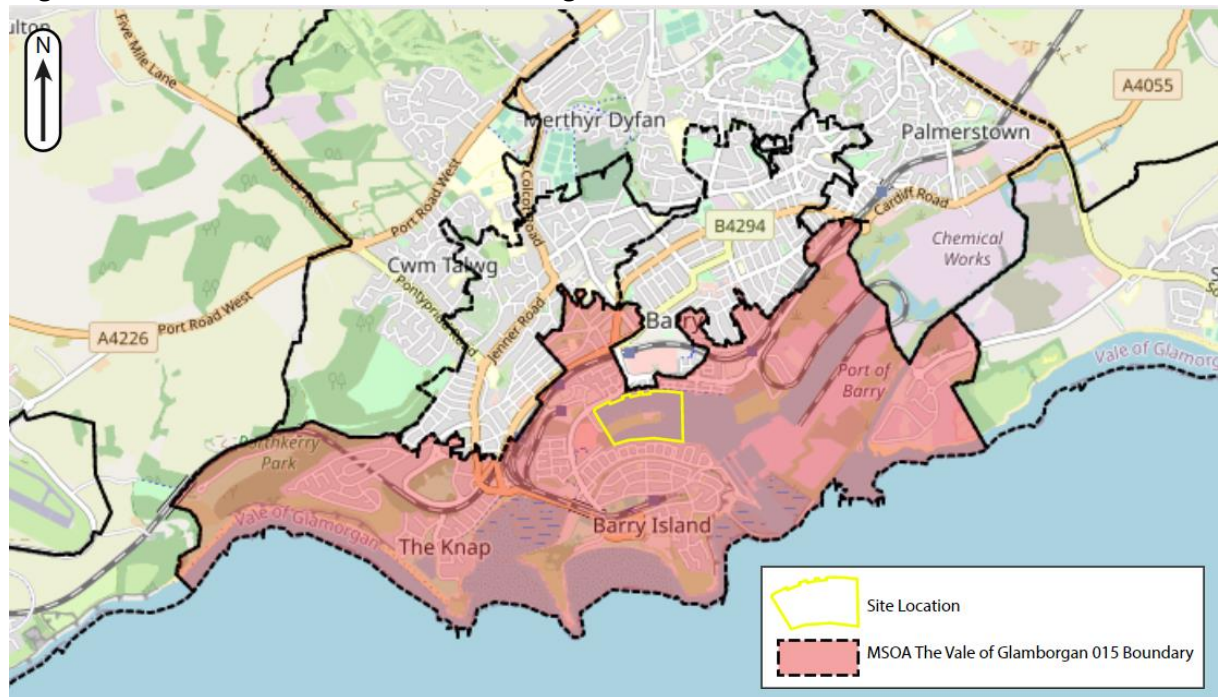
Photograph 2.1- OWT site at The Mole



Existing Travel Behaviour

- 2.5 In the context of existing travel behaviour within the vicinity of the site, the 2011 Census 'method of travel to work' data has been examined in order to determine the current mode-split for residents of the local area. Despite the 2021 Census being completed, the 2011 data is the most recently available travel to work data while the 2021 Census can be used for information such as car availability.
- 2.6 The MSOA in which the site lies (The Vale of Glamorgan 015) is considered appropriate for establishing existing travel patterns and is illustrated within **Figure 2.2**.

Figure 2.2 - MSOA The Vale of Glamorgan 015



(source: www.nomisweb.co.uk)

- 2.7 Discounting the ‘work from home’, ‘underground’ and ‘not in employment’ methods of travel, the mode split for the remaining modes is demonstrated within **Table 2.1**.

Table 2.1 – Mode Split

Mode	MSOA Sample	%
Train	351	9%
Bus, minibus or coach	85	2%
Taxi	20	1%
Motorcycle, scooter or moped	16	0%
Driving a car or van	2,643	70%
Passenger in a car or van	227	6%
Bicycle	54	1%
On foot	342	9%
Other method of travel to work	40	1%
Total	3,778	100%

- 2.8 As shown in **Table 2.1**, there are a good number of residents who, in 2011, journeyed to work by sustainable modes i.e., 9% by foot, 9% by train, 6% as a passenger in a car or van and 3% by bus or bike.
- 2.9 A combination of factors including improvements in infrastructure, changes in attitudes and awareness and other social economic factors as well as planning policy and the climate emergency have contributed to increased levels of active travel and public transport in Barry since the 2011

Census. It is anticipated that travel by sustainable modes will be more prevalent now than is evident from the data contained in **Table 2.1**.

Car Availability

- 2.10 The 2021 Census has been reviewed for Car Availability within the MSOA W02000251: Vale of Glamorgan 015. **Table 2.2** compares the number of households, house type and no. of cars.

Table 2.2 – Car Availability (MSOA W02000251: Vale of Glamorgan 015)

No. of Cars	Number of Households	Whole house or bungalow		Flat, maisonette, apartment	
		No.	%	No.	%
No cars or vans in household	1,124	502	13%	622	42%
1 car or van in household	2,350	1,656	44%	694	47%
2 or more cars or vans in household	1,731	1,570	42%	161	11%
Total	5,205	3,728	100%	1,477	100%

- 2.11 It can be seen from **Table 2.2** that 13% of households in the MSOA do not have a car (House and Bungalow) while this increases to 42% for Flats, Maisonette and apartments.
- 2.12 The number of households with no car or one car in the household is 57% for the Whole house or bungalow category or and 89% for the Flat, maisonette, apartment category.
- 2.13 This analysis of the 2021 Census demonstrates that the majority of households in this central location within Barry either do not have a car or have one car only.

20-Minute Neighbourhoods

- 2.14 It is generally accepted that walking and cycling provide important alternatives to the private car and should also be encouraged to form part of longer journeys via public transport. For example, research undertaken by the Chartered Institution of Highways and Transportation (CIHT) outlines that most people would walk to a destination within one mile or cycle for a journey within five miles.
- 2.15 Moreover, Manual for Streets (MfS) identifies ‘walkable neighbourhoods’ as being:
 “characterised by having a range of facilities within 10 minutes (up to about 800m) walking distance of residential areas which residents may access comfortably on foot.”
- 2.16 However, it is important to recognise that MfS does not consider 800 metres to be a maximum walking distance. Indeed, MfS contends that walking can be used to access a variety of destinations within a range of up to 2 kilometres.
- 2.17 More recently, there has been an emergence of ‘20-minute neighbourhoods’, based on a design ethos of creating complete, compact and connected neighbourhoods, where people can meet their

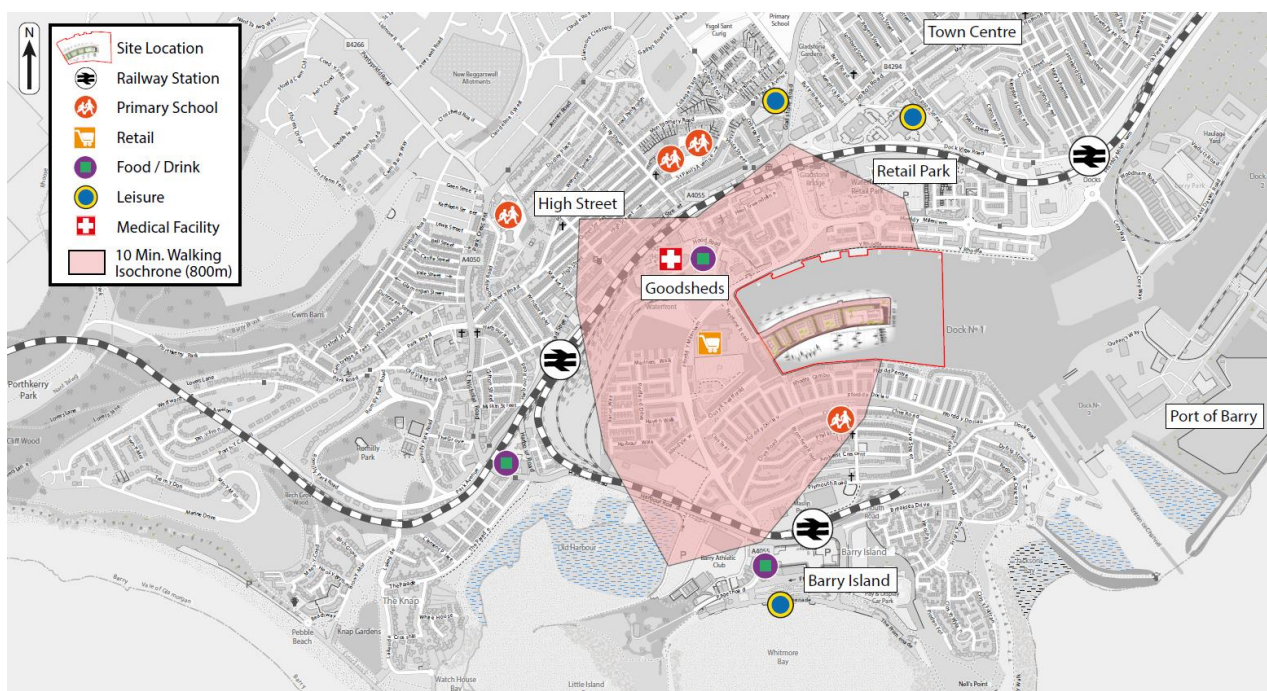
everyday needs within a short walk or cycle. This concept builds upon the notion of walkable neighbourhoods and places designed at pedestrian scale and is supported by a 20-minute neighbourhood guide published by the Town and Country Planning Association in March 2021.

- 2.18 The concept of walkable neighbourhoods is further captured within Placemaking Wales' Placemaking Guide (2020). Within the guide it is noted that walkable neighbourhoods provide opportunities for reducing car travel to tackle climate change whilst simultaneously improving mental wellbeing and boosting local economies.
- 2.19 The existing characteristics of Barry Waterfront are conducive to the 20-Minute Neighbourhood principles and the mixed use development proposed will further contribute towards this and complement the existing Barry Waterfront development.

Local Facilities

- 2.20 There are a plethora of local facilities and amenities within a comfortable walking and cycling distance of the site. A breakdown of these facilities is shown in **Table 2.2** and displayed in **Figure 2.3**.

Figure 2.3 – Selected Local Facilities



- 2.21 The distance of these facilities from the site, plus the estimated walking and cycling times, are set out in **Table 2.2**.

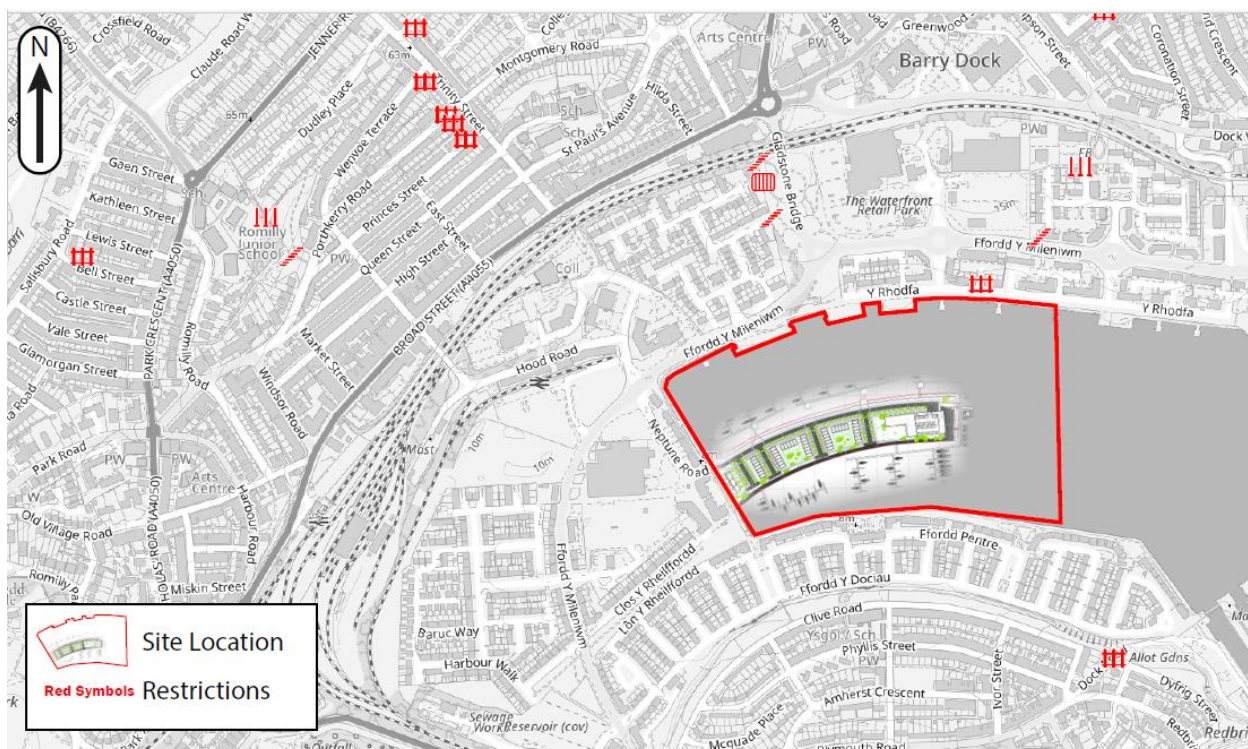
Table 2.2 – Local Facilities

	From Centre of Site		
Local Facility	Distance (m)	Walk (mins)	Cycle (mins)
Transport			
Barry Asda Bus Stop	450	6	2
Brewers Fayre Bus Stop	500	6	1
Barry Train Station	1,200	15	5
Barry Docks Train Station	1,800	23	7
Barry Island Train Station	1,100	13	4
Education			
Barry Island Primary School	450	6	6*
Ysgol Gymraeg Sant Baruc	500	6	2
High Street Primary School	1,200	16	8
Romilly Primary School	1,400	20	10
Health Centres			
West Quay Dental Practice	600	8	3
West Quay Medical Centre	600	8	3
Aneurin Evans Pharmacy	600	8	3
Food and Drink			
Goodsheds (and associated food / drink / retail outlets	500	6	2
Academy Espresso Bar	500	6	2
Alium (restaurant)	500	6	2
Leisure			
Barry Island	1,000	12	4
Barry Leisure Centre	1,300	16	5
Barry High Street	850	12	6
Memo Arts Centre	1,100	14	5
Employment / Retail			
ASDA	150	2	1
Waterfront Retail Park	1,000	12	4
King Square, Town Centre	1,600	21	9

*This route avoids steps

- 2.22 The proximity of the site to these facilities is essential in encouraging a shift towards active travel for users of the site, who may otherwise lean towards the utilisation of private vehicle to make these trips. The proximity to a supermarket and to local medical facilities are considered excellent for this location, as well Barry High Street which offers amenities such as pubs, restaurants, retail and healthcare facilities.
- 2.23 The restrictions layer for DataMapWales has been consulted. This layer highlights restrictions along active travel routes, such as steps, gates and bollards. The mapping demonstrates that there are no restrictions along key routes between the proposed development and significant facilities, such as the local railway stations, retail park and town centre. An extract of this map is displayed below on **Figure 2.4**.

Figure 2.4 – Restrictions in the vicinity of the Site



- 2.24 There will also be an element of internalisation within the site between the various land uses.

Walking

- 2.25 Walking sits at the top of the travel mode hierarchy and is a key theme of Planning Policy Wales (PPW 11) and the Active Travel (Wales) Act. New development, such as this one, should be designed to promote and encourage walking at the top of this hierarchy.
- 2.26 The site is within walking distance of a number of local facilities, accessed via the good pedestrian infrastructure in the locality. The site is a 13 minute walk from Barry Island railway station and a 15 minute walk from Barry railway station. The nearest bus stops are within 500m of the centre of the site. There are pedestrian crossing points, footways and street lighting on routes to all the local facilities.

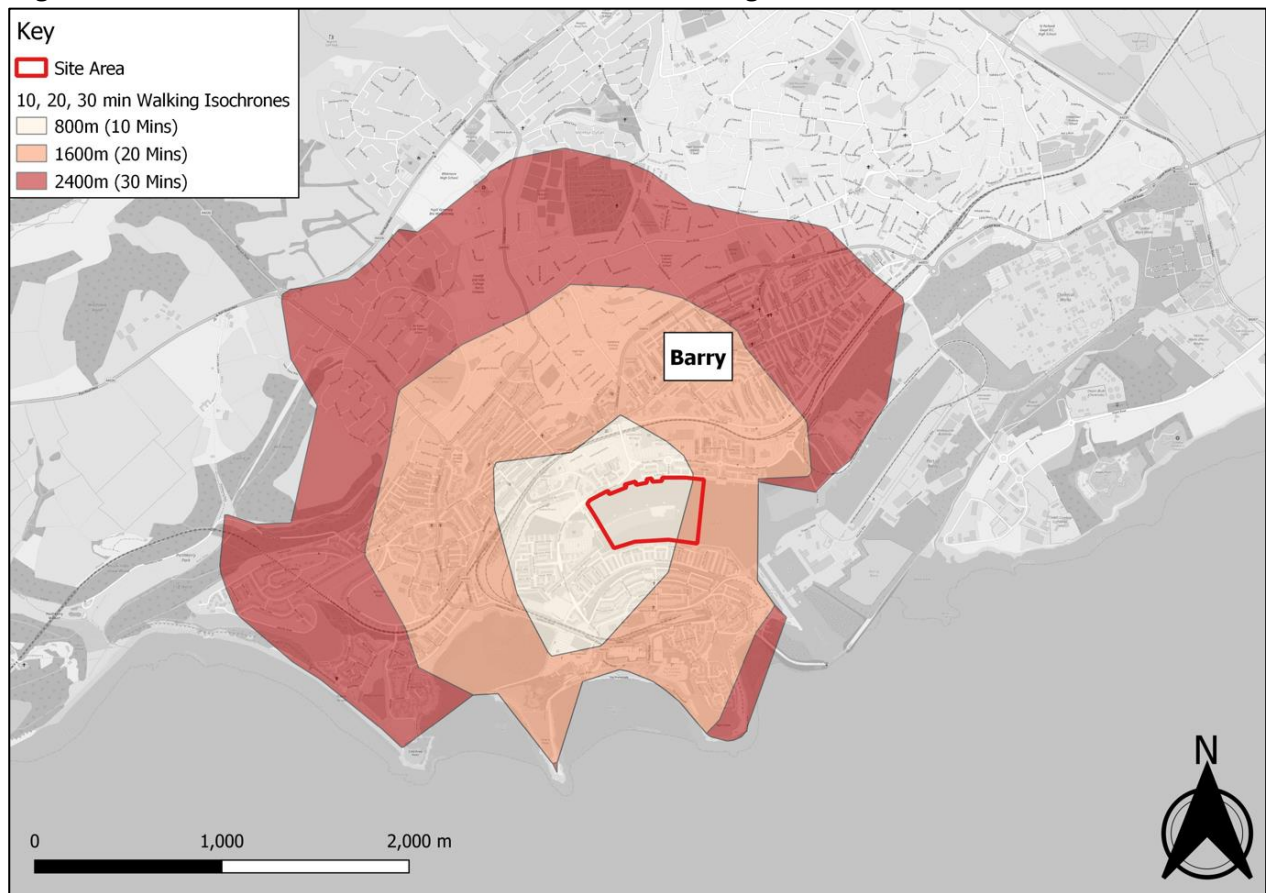
- 2.27 There are no Public Rights of Way (PRoW) within the immediate vicinity of the site, though this is negated by the excellent existing provision of footways and lighting in the area surrounding the site. Pedestrian connections exist towards the town centre, Barry train station and towards Barry Island also.
- 2.28 There is a good existing pedestrian crossing across Ffordd y Mileniwm in the form of puffin crossings providing onward access to Hood Road and Broad Street where local services including shops, pubs and employment areas are located. The junction on Ffordd y Mileniwm is shown in **Photograph 2.2**.

Photograph 2.2 – Ffordd y Mileniwm / Neptune Road / Hood Road junction



- 2.29 There are also good pedestrian links to Barry Island and Whitmore Bay, a popular leisure destination to the south. Connections to local leisure destinations will reduce the need of local residents to travel by private vehicle to locations further away for leisure purposes and support travel choices.
- 2.30 In practice, the distance that any individual is likely to choose to walk depends on that individual and their circumstances. Given current policies to promote health, wellbeing and active travel, there is an expectation that walking levels will increase.
- 2.31 **Figure 2.5** shows the indicative 10, 20 and 30 minute walking isochrones from the centre of the site.

Figure 2.5 – 10, 20 and 30 Minute Indicative Walking Isochrones



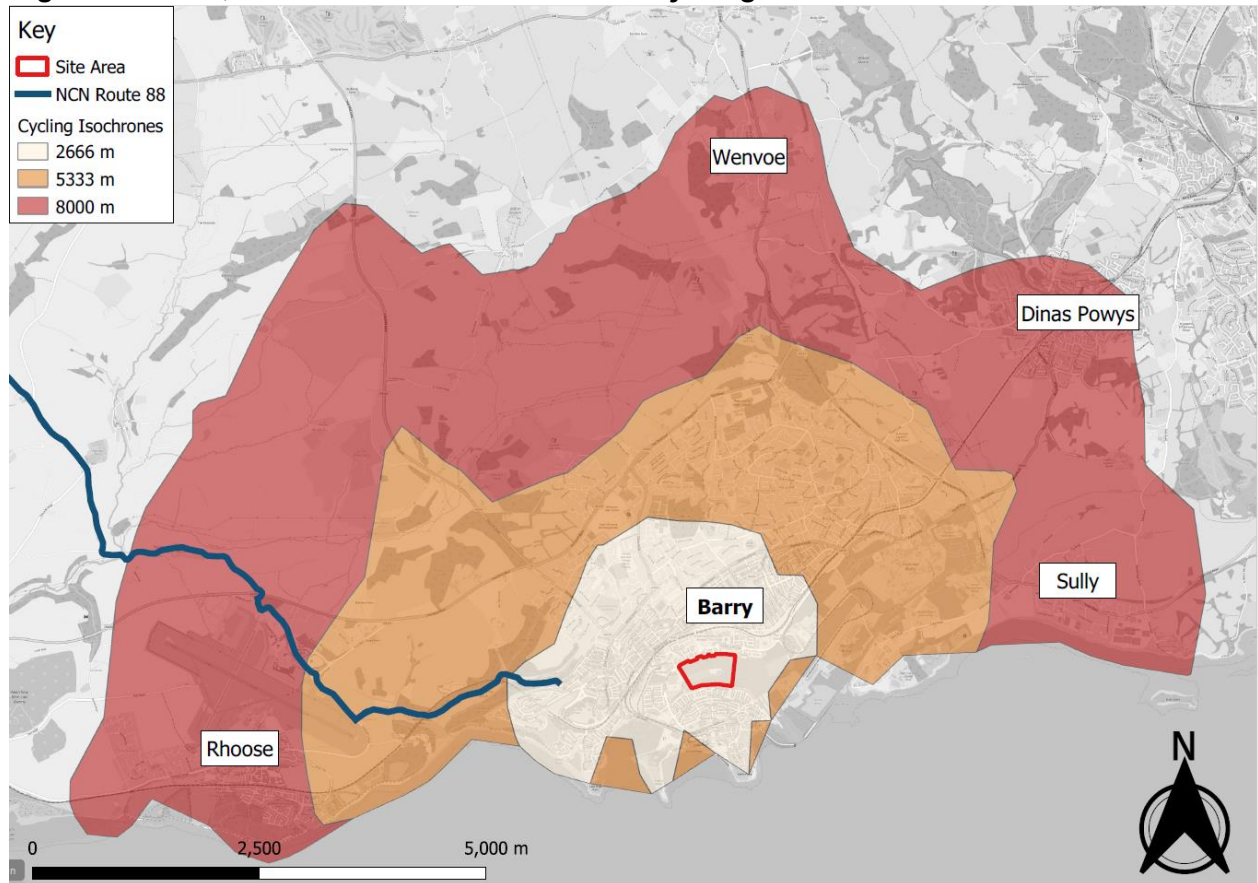
Cycling

- 2.32 The Active Travel Network Map illustrates the location of current and future walking and cycling routes. The main route in the vicinity of the site is the Ffordd Y Mileniwm (S) route, suitable for cyclists, pedestrians and wheelchair users. This provides access towards Barry Island beach to the south and The Waterford Retail Park and Barry Docks train station to the east.
- 2.33 Hood Road to the northwest of the site off Ffordd Y Mileniwm has lower vehicle flows than Ffordd Y Mileniwm, making it an attractive route for active travel users, providing access to Barry town centre. The Active Travel Network Maps indicates that this route will be improved in the short-term for both cyclist and pedestrian use.
- 2.34 There is cycle parking at Barry railway station and the route from the site to the station consists of mostly cycle-friendly roads (Hood Road and Broad Street). Routes between the site and local facilities such as this are important in encouraging multi-modal forms of travel for commutes or journeys undertaken by train.
- 2.35 The National Cycle Network Route 88 (NCN 88) is located approximately 1.5km northwest of the site and provides a leisure route which connects with Porthkerry Country Park. It routes between Barry and the south of Bridgend via Llantwit Major and St Donat's.

2.36 Additionally, there are bicycle repair stations for public use at Barry Leisure Centre and Barry Island car park.

2.37 **Figure 2.6** shows the indicative 10, 20 and 30 minute cycling distances from the centre of the site.

Figure 2.6 – 10, 20 and 30 Minute indicative Cycling Isochrones



Public Transport

Bus

2.38 There are good bus links within Barry for both local areas and for connections to the centre of Barry, Dinas Powys and Cardiff. The nearest bus stops to the site are the 'Brewer's Fayre' and 'Barry Asda' stops from which the bus times in **Table 2.2** have been taken. The 'Brewer's Fayre' bus stops benefits from a sheltered waiting facility, timetable information on display and a bench for passengers and is located approximately 500 metres to the north of the site along "Ffordd y Mileniwm".

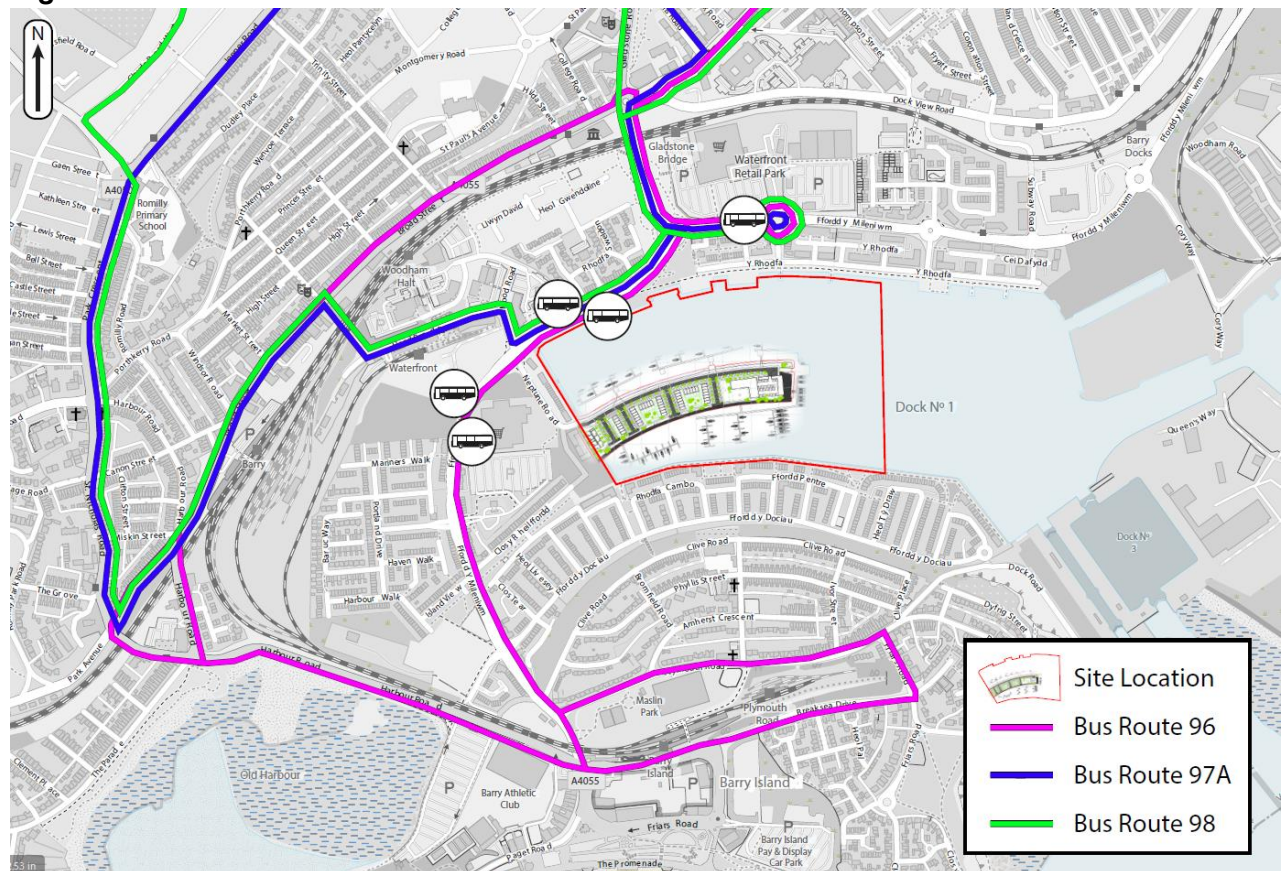
Table 2.3 – Local Bus Services

Service	Route	Time		Frequency (mins)			Service Provider
		First Bus	Last Bus	Mon-Fri	Sat	Sun	
95	Heath Hospital – Barry Island	07:36	22:04	60	60	60	Cardiff Bus
	Barry Island – Heath Hospital	06:36	21:19	60	60	60	
97A	Barry Circular (from Brewer's Fayre)	07:44	17:29	30	30	N/A	Cardiff Bus
98	Highlight Park – Barry	08:34	14:40	60	N/A	N/A	Cardiff Bus

2.39 As shown in **Table 2.3** there are several services from bus stops surrounding the site which link to local facilities as well as destinations further afield such as Cardiff. There are also onwards connections from bus stops in Barry town centre to Cardiff via Penarth and to Cardiff via Wenvoe from the 94 and 96 routes respectively. The site is served by a minimum of one bus every 30 minutes.

2.40 A map of the local bus services is shown in **Figure 2.7**. Bus route service 95 is also to be extended within the 'West Pond' area of the 'Barry Waterfront Development'. The West Pond Area is located to the immediate west of the site adjacent to 'Ffordd y Mileniwm'.

Figure 2.7 – Local Bus Routes



Rail

- 2.41 Rail provision in Barry is excellent. There are services running to Cardiff every 15 minutes as well as an hourly service to Bridgend which stops at Rhoose Cardiff International Airport. Barry Station, the most convenient station for The Mole site, is served by the Vale of Glamorgan Line. It benefits from regular services, 10 bicycle parking spaces, 110 free car parking spaces with 3 accessible spaces, a ticket office, ticket machines, departure / arrival screens and other facilities for users such as refreshment facilities and waiting rooms.
- 2.42 The Barry-Cardiff route is regularly used by commuters with a typical journey time of 25mins. It is expected that this service will be a viable and attractive option for travel to and from The Mole site.

Table 2.4 – Summary of Rail Services from Barry Railway Station

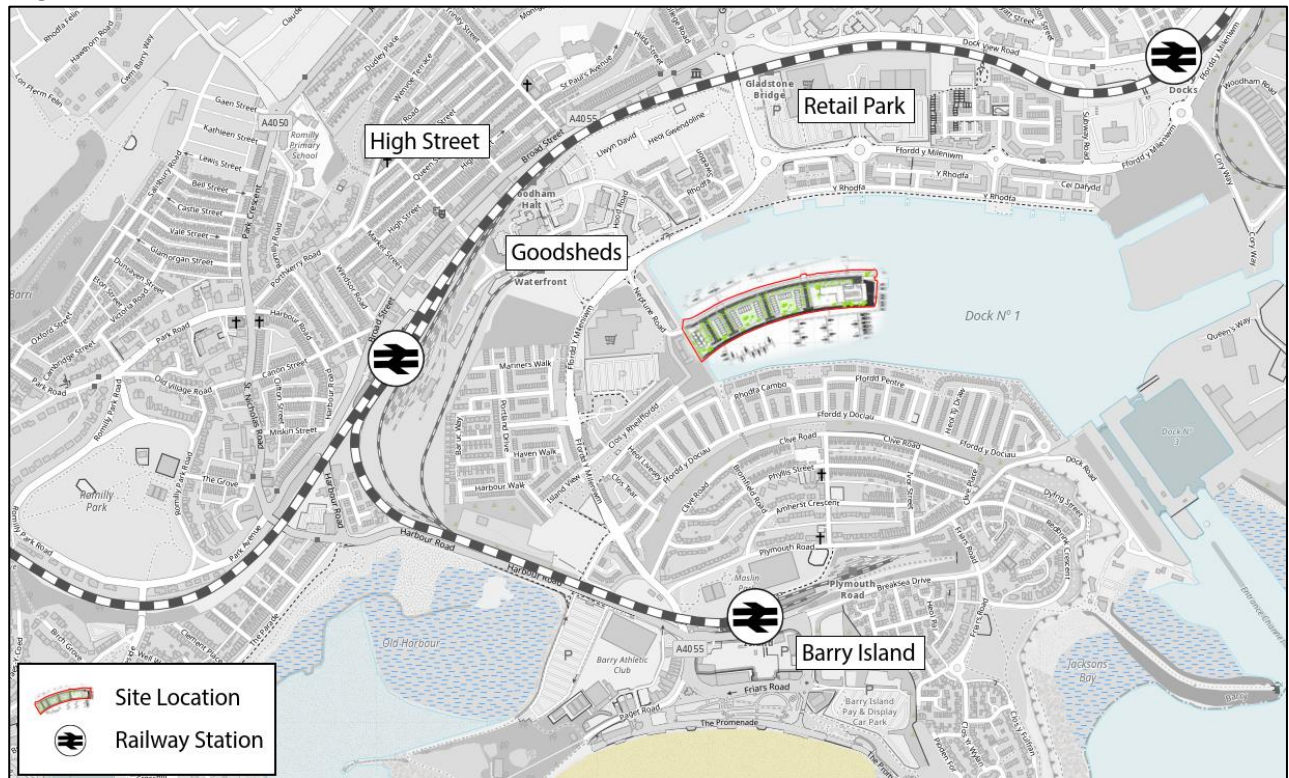
Destination	Frequency (mins)	Journey Time
Merthyr Tydfil, via Cardiff Central	15	25 mins (to Cardiff)
Bridgend via Rhoose	60	34 mins (to Bridgend)

- 2.43 The service to Merthyr Tydfil via Cardiff also calls at Dinas Powys, Cogan, and Pontypridd as well as other stops along the Vale of Glamorgan line. The proximity of this station to the proposed

development is beneficial in that it provides a regular service to a variety of destinations. The availability of car parking and cycle parking spaces also encourage multi-modal travel.

2.44 The location of the local train stations are shown in **Figure 2.8**.

Figure 2.8 – Local Train Stations



Public Transport Improvements

Barry Docks Transport Interchange

2.45 In August 2022, the VoG Council approved plans for a transport interchange at Barry Docks railway station.

2.46 The interchange will establish a bus and taxi interchange to the south of the station platforms. It will also lay the foundations to provide an additional Park & Ride car park, accessed from Dock View Road, to the north of the Station platforms and Residential and possibly Commercial Uses to the north west of the station, as future development phases.

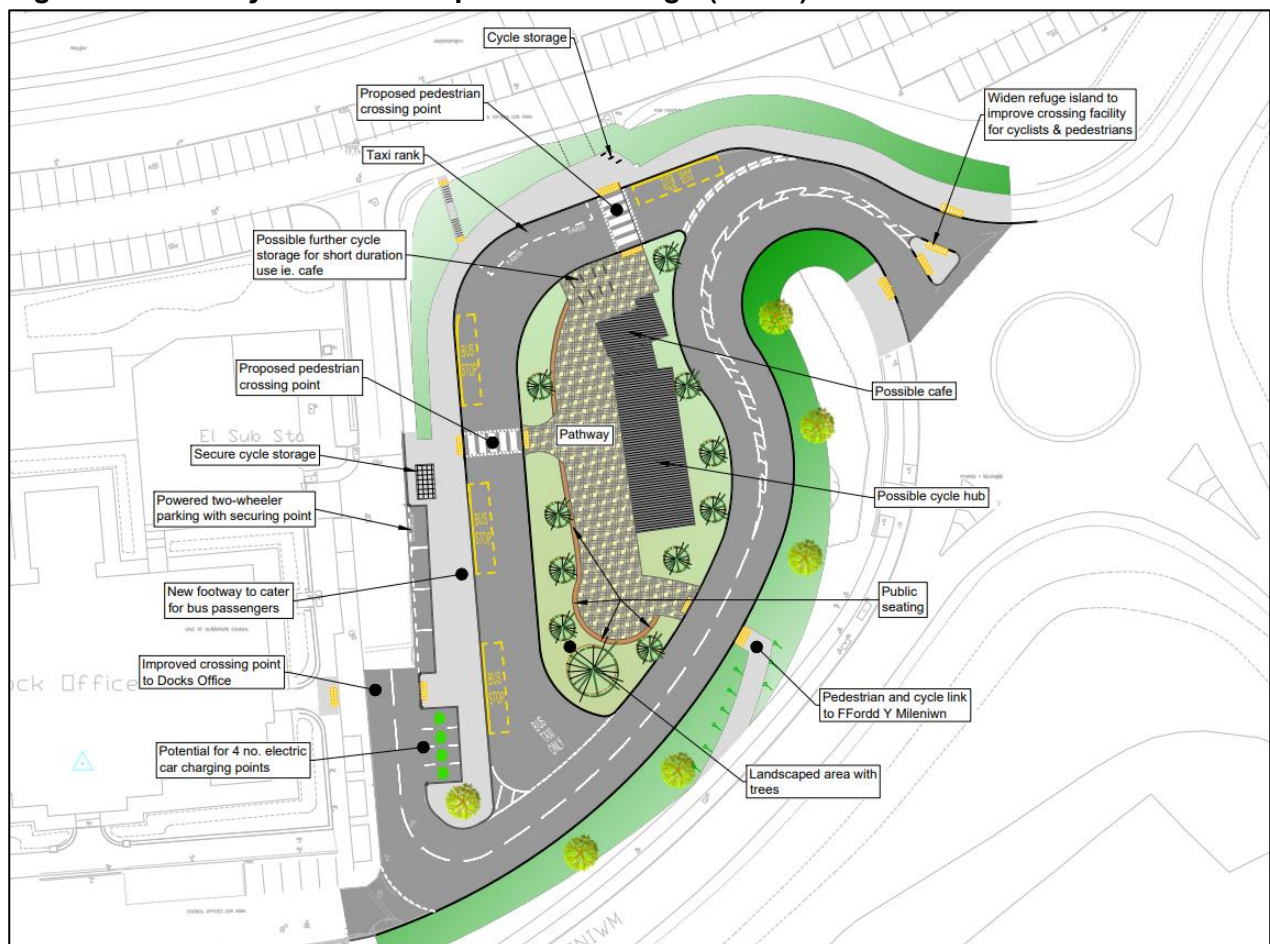
2.47 The Transport Interchange will include:

- Capacity to accommodate a small number of business, retail and/or community hubs in its central area.
- Electric vehicle charging infrastructure will be provided in car park areas that can be used by both station users or local residents
- Improvements to existing pedestrian and cycle route to the Station from Dock View Road

- Designated cycle and pedestrian route (and crossings) provided north/south across the site
- Existing pedestrian subway leading to the station platforms will be refurbished
- Additional cycle parking (Sheffield stands and cycle lockers) will be provided
- Signage, lighting and seating in the station vicinity will be improved.

2.48 The approved layout is included at **Figure 2.9** and in full in **Appendix B**.

Figure 2.9 – Barry Docks Transport Interchange (south)



South Wales Metro

2.49 As a part of the South Wales Metro plans, Transport for Wales (TfW) have committed to retaining the link from Penarth, Barry and Bridgend to destinations north of Cardiff Central using new tri-mode trains (overhead electric, battery and diesel) from December 2023.

Barry Accessible Station Improvements

2.50 The improvements at Barry station are funded by the Department for Transport and Welsh Government through the Access for All programme.

- 2.51 The £3.3m project ensure that platforms 2 and 3 at Barry are fully accessible for the first time. Increased accessibility can promote the use of the rail network and provide better interchange options and ease of use.

Photograph 2.3 – Barry Railway Station Accessible Overbridge & Lifts



E-bikes

- 2.52 The rise in popularity of e-bikes has led to a broader range of people cycling either using an e-bike or conventional cycle. E-bikes attract users that otherwise may not consider using a bike as well as enabling people to travel further and for longer periods of time with less physical effort compared to conventional cycles. In the U.K, you must be 14 or over to ride an e-bike.
- 2.53 Research published in July 2021 by the academics Melia and Bartle¹ found that e-bikes have potential, which has not yet been realised, to fulfil a wide range of transport needs. They support people with physical constraints to continue cycling; they enable people to cover longer distances, carry cargo and children, overcome hills and cope more easily with bad weather.
- 2.54 E-bikes therefore provide a greater opportunity to attract users out of cars, particularly for regular shorter journeys. In replacing car trips for shorter (or medium) length journeys though they pose challenges that vary from conventional cycles. Specific challenges include access to secure parking and charging infrastructure. New development such as this should seek to address these challenges where practical.

¹ Who uses e-bikes in the UK and why? (July 2021) Steve Melia and Caroline Bartle

- 2.55 The closest e-bike hire scheme is the Cardiff NextBike scheme, with the closest docking station to the site at Sully Sports and Social Club, approximately 7km east of the site.

Local Highway Network

Neptune Road

- 2.56 Neptune Road runs in a north-south direction to the immediate west of the site. The road is currently unadopted and is a part of the Persimmon development at Barry Waterfront. It connects the site with Ffordd y Mileniwm, a main route through Barry. It is a two-way single carriageway residential estate road with footways and street lighting. The road is subject to a 30mph speed limit. There is a signalised crossing to the north of Neptune Road at its junction with Ffordd y Mileniwm forming part of the signal controlled junction.

Ffordd y Mileniwm

- 2.57 Ffordd y Mileniwm is one of the main through-routes within Barry, linking Barry Island in the west to the A4055 Cardiff Road in the east. Within the vicinity of the site it is a two-way single carriage way subject to a 30mph speed limit, with footways and street lighting. There are several bus stops along the road as well as multiple crossing points for pedestrians where necessary.

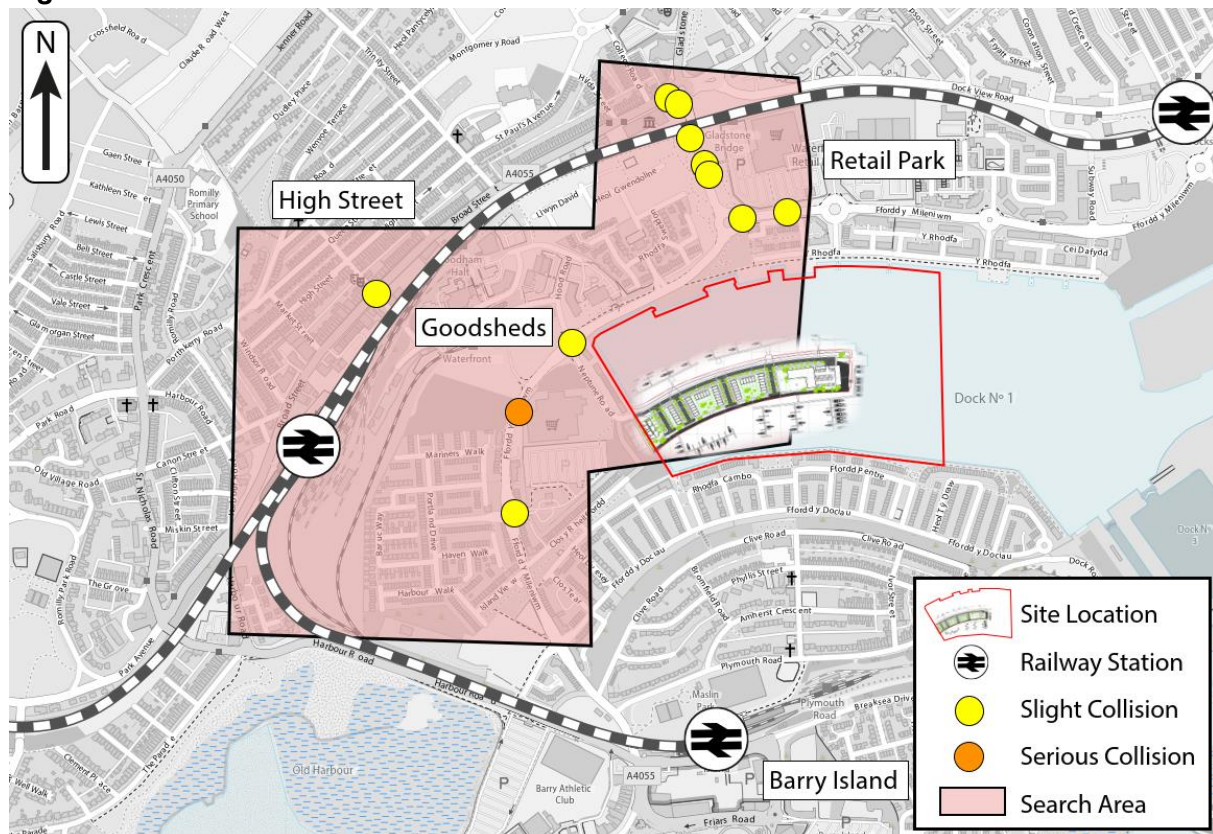
Further Highway Network

- 2.58 While the local highway network is typical of that of most towns, there are also onward connections via the A4050 and the A4226 to key local destinations. The A4050 leads north from Barry towards Culverhouse Cross and the A4232, which in turn connects to M4 (J33). The A4226 leads west towards Cardiff Airport and the settlements of Rhoose and Llantwit Major. The A4226 known locally as Five Mile Lane has recently been improved and provides access to the A48 and onward destinations such as Bridgend to the west and Cardiff to the east.

Personal Injury Collision Review

- 2.59 An investigation into the number and location of Personal Injury Collisions (PIC) has been undertaken by reviewing data obtained from the Welsh Government. The available data is between February 2017 and January 2022, the findings are summarised below.
- 2.60 Between 2017 and 2021, there were 11 PIC recorded on the highway network within the vicinity of the site. Of these collisions, 10 were classified as 'slight', with one 'serious' and no 'fatal' collisions recorded. The locations of the collisions are shown in **Figure 2.10**.

Figure 2.10 – Collision Locations



Slight Collisions

- **20/02/2017**
Ffordd Y Mileniwm (south of ASDA)
This collision involved two vehicles, a car and a pedal cycle, and one casualty, the rider of the pedal cycle. The cyclist rode into the carriageway into the path of the car. The casualty was 13 years of age indicating some inexperience with cycling on-road, with the secondary causation factor referencing a learner or inexperienced driver / rider.
- **21/08/2017**
Broad Street / Island Road crossroads
This collision involved one vehicle, a car, and one casualty, the driver. The cause is given as “driver has felt unwell at traffic signals, and has pulled off and lost control of vehicle and veered to nearside and collided with a wall.”
- **16/04/2018**
Ffordd Y Mileniwm / Gladstone Road Roundabout
This collision involved two vehicles, both cars, and one casualty, a driver. The first vehicle collided with the rear of the second as it was waiting to enter the roundabout. The contributory factor is given as failure to look properly.
- **24/06/2018**
Gladstone Bridge

This collision involved two vehicles, a car and a pedal cycle, and one casualty, the rider of the pedal cycle. The vehicle collided with the pedal cycle as the cyclist was turning right to re-join the cycle path. The car did not stay at the scene of the collision and as such further information is not available.

- **05/02/2019**

Gladstone Bridge / Broad Street Roundabout

This collision involved two vehicles, a car and a pedal cycle, and one casualty, the rider of the pedal cycle. The car entered the roundabout intending to go straight ahead and collided with the rear wheel of the pedal cycle, causing the rider to fall to the ground and sustain a broken wrist. The contributory factors are given as a slippery road (due to weather), and failure to judge other person's path or speed.

- **19/02/2019**

Gladstone Bridge / Broad Street Roundabout

This collision involved two vehicles, a van and a pedal cycle, and one casualty, the rider of the pedal cycle. The rider of the pedal cycle entered the roundabout with intention of proceeding across when the transit van failed to see the cyclist, and the cyclist has collided with the offside of the van. The van failed to stop at the scene. The contributory factors are given as failure to look properly, failure to judge other person's path or speed, and disobeyed Give Way or Stop sign or markings.

- **03/05/2019**

Gladstone Bridge

This collision involved two vehicles, both cars, and four casualties. Vehicle One stopped at the pedestrian crossing, and Vehicle Two travelling behind did not stop in time and collided with the rear of Vehicle One. The first casualty was the driver of Vehicle One, with the other three casualties being the driver and passengers of Vehicle Two. The contributory factors are given as sudden braking and failure to judge other person's path or speed.

- **27/02/2021**

ASDA / Ffordd Y Mileniwm Junction

This collision involved two vehicles, both cars, and one casualty. Vehicle One exited the ASDA petrol station and collided with Vehicle Two which was travelling along the main carriageway. The causation factor is given as failure to look properly.

- **02/05/2021**

Neptune Road

This collision involved one vehicle, a taxi, and one casualty, the passenger. The casualty alighted from the taxi, and as the taxi moved off the casualty, who was in close proximity, came into contact with the vehicle as it has moved off.

- **04/08/2021**

Gladstone Bridge

nearside of Vehicle Two whilst Vehicle Two was performing a U-turn. The first casualty was the driver of Vehicle One, with the other three casualties being the driver and passengers of Vehicle

Two. The contributory factors are given as being impaired by alcohol, and being careless, reckless or in a hurry.

- **20/01/2022**

Ffordd Y Mileniwm by Retail Park bus stop

This collision involved two vehicles, both cars, and one casualty. The vehicles were in slow moving traffic when Vehicle One collided with the rear of Vehicle Two when it came to a stop, causing minor damage.

Serious Collisions

- **20/02/2019**

Neptune Road

This collision involved one vehicle, a motorcycle, and one casualty, the rider. The motorcycle was being ridden along Ffordd Y Mileniwm when, due to slippery conditions, the rider came away from the motorcycle and fall to the carriageway.

2.61 **Table 2.5** below summarises the collisions for each year. It should be noted that the dates searched only covers part of 2022.

Table 2.5 – PIC Summary Table

Year	Slight	Serious	Fatal
2017	2	0	0
2018	2	0	0
2019	3	1	0
2020	0	0	0
2021	3	0	0
2022*	1	0	0

*Details: *2022 covers half the year only*

2.62 There are no anomalies in terms of the number of collisions over the past five year period.

2.63 There is a cluster of six collisions at and around the roundabout between the Gladstone Bridge and Ffordd Y Mileniwm and the Gladstone Bridge/Broad Street roundabout, all demonstrated to be as a result of driver error.

2.64 Upon review, the collisions are not considered to be the result of existing highway layouts or suggest an existing highway safety issue or trend which could be exacerbated by the proposed development.

3 Policy Review

Overview

- 3.1 This section of the report outlines relevant policies for development and transport in Wales and in the VoG, which are cognisant of one another and follow a common theme; moving towards carbon reduction in the promotion of development, supporting virtual and active mobility, followed by public transport with private vehicle trips at the bottom of the hierarchy. This hierarchy is demonstrated in **Figure 3.1**.

National Policy

Planning Policy Wales (Edition 11) (February 2021)

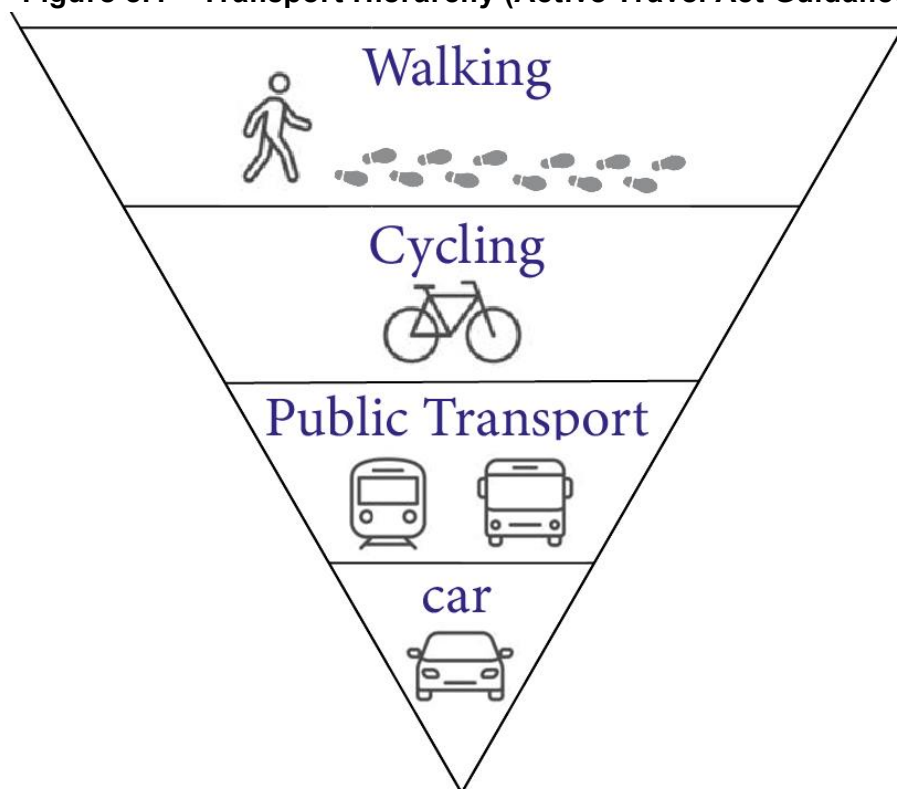
- 3.2 Planning Policy Wales Edition 11 (PPW11) sets out the land use planning policies of the Welsh Government. The primary objective of PPW11 is to:

“Ensure that the planning system contributes towards the delivery of sustainable development and improves the social, economic, environmental and cultural well-being of Wales.”

- 3.3 Section 4 of PPW11 concerns Active and Social places. It asserts that Active and Social Places are those which provide well-connected cohesive communities and further state that a ‘Resilient Wales’ is supported by protecting existing communities and natural environments whilst well-connected infrastructure and facilities closer to where people live.
- 3.4 Furthermore, with regards to sustainable transport, PPW11 advises that, in the context of active and social places, developments should encourage modal shift and be easily accessible by walking, cycling and public transport, by virtue of their location, design and provision of on and off-site sustainable transport infrastructure.
- 3.5 A key theme throughout PPW is the aim of reducing reliance on travel by private car, and the adverse impacts of motorised transport on the environment and people’s health, by prioritising and increasing active travel and public transport. Additionally, it states that development proposals must seek to maximise accessibility by walking, cycling and public transport, by prioritising the provision of appropriate on-site infrastructure and, where necessary, mitigating transport impacts through the provision of off-site measures, such as the development of active travel routes, bus priority infrastructure and financial support for public transport services.
- 3.6 It is Welsh Government policy to require the use of a sustainable transport hierarchy in relation to new development, which is; walking, cycling, ultra-low emission vehicles and public transport. To this extent, paragraph 4.19 relates specifically to sustainable transport and states:

“The Welsh Government is committed to reducing reliance on the private car and supporting a modal shift to walking, cycling and public transport. Delivering this objective will make an important contribution to decarbonisation, improving air quality, increasing physical activity, improving the health of the nation and realising the goals of the Well-being of Future Generations Act.”

Figure 3.1 – Transport Hierarchy (Active Travel Act Guidance 2021)



Llwybr Newydd – The Wales Transport Strategy (May 2021)

- 3.7 The Transport Strategy for Wales sets out the ‘new path’ that will shape the transport system over the next 20 years. It is a “new way of thinking that places people and climate change at the front and centre of our transport system”. This document crucially defines the climate emergency as one of the biggest defining issues of our time, and the need to achieve net zero by 2050.
- 3.8 Llwynr Newydd seeks to improve the social, economic, environmental and cultural well-being of Wales. It contains seven well-being goals which local authorities as well as other public bodies must seek to achieve in order to improve well-being both now and in the future.
- 3.9 The strategy sets out three urgent priorities which are illustrated in **Figure 3.2**.

Figure 3.2 – Wales Transport Strategy Priorities

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

- 3.10 Priority 1 seeks to reduce the need for people to use their cars on a daily basis by:
- Supporting remote working in line with Welsh Government target of 30% remote working;

- Locate new public services close to where people live and to existing public transport routes;
- Design new developments to be walk and cycle friendly from the outset;
- Maximise the use of land close to transport hubs;
- Improve access to fast and reliable broadband; and
- Set aside land for multi-modal hubs to transfer freight to smaller vans or e-cargo bikes for last mile deliveries.

- 3.11 The mobility strategy for the site will continue to be developed to meet these criteria including provision of a mobility hub as well as consideration for a community concierge facility to handle last mile deliveries, in accordance with the aspirations of Priority 1.
- 3.12 Priority 2 aims to achieve a shift away from private car use to more sustainable transport modes, enabling more people to walk, cycle, and use public transport, as well as low-emission vehicles.
- 3.13 Infrastructure will be future-proofed where possible to adapt to climate change and facilitate more sustainable transport choices. In addition, new infrastructure will give priority to interventions that support walking and cycling, public transport and ultra-low emission vehicles over other private motor vehicles.
- 3.14 Priority 3 seeks to encourage people to change their travel behaviour to use low carbon, sustainable transport. This will be done through (but not limited to):
- Developing a range of behaviour-change projects;
 - Move from individual vehicle ownership to shared solutions;
 - Reduce the cost of sustainable travel; and
 - Support digital innovation.
- 3.15 Through the location of the development and promotion of active travel, the development will meet these priorities with the overall aim being to encourage accessible, sustainable and efficient transport and travel to and from the site.

Future Wales – The National Plan 2040 (February 2021)

- 3.16 ‘Future Wales – the National Plan 2040’ (Future Wales) is the national development framework, setting the direction for development in Wales to 2040. Future Wales strongly considers the Well-Being of Future Generations (Wales) Act 2015, which gives a legally-binding common purpose – the seven well-being goals – for national government, local government, local health boards and other specified public bodies. It details the ways in which these bodies must work, and work together, to improve the well-being of Wales.

- 3.17 Future Wales recognises that Placemaking is at the heart of the planning system in Wales, and that this policy establishes a strategic placemaking approach and principles to support planning authorities to shape urban growth and regeneration.
- 3.18 Policy Two of Future Wales is titled Shaping Urban Growth and Regeneration – Strategic Placemaking. It states that Urban growth and regeneration should be based on the following strategic placemaking principles:
- creating a rich mix of uses;
 - providing a variety of housing types and tenures;
 - building places at a walkable scale, with homes, local facilities and public transport within walking distance of each other;
 - increasing population density, with development built at urban densities that can support public transport and local facilities;
 - establishing a permeable network of streets, with a hierarchy that informs the nature of development;
 - promoting a plot-based approach to development, which provides opportunities for the development of small plots, including for custom and self-builders; and
 - integrating green infrastructure, informed by the planning authority’s Green Infrastructure Assessment.
- 3.19 Within its Strategic Placemaking Principles, Future Wales considers mix of uses, variety of housing, walkable scale, density, street network, plot-based development and green infrastructure.
- 3.20 Of vital importance to new developments such as the proposed site is the concept of the ‘walkable scale’. This strategic placemaking principle states that to enable active and healthy lives, people should be able to easily walk to local facilities and public transport.




Active Travel (Wales) Act 2013 (October 2013)

- 3.21 The Active Travel (Wales) Act aims to make it easier for people to walk and cycle in Wales and makes it a legal requirement for local authorities in Wales to map and plan for suitable routes for active travel, and to build and improve their infrastructure for walking and cycling every year. It creates new duties for highways 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.
- 3.22 By connecting key sites such as workplaces, hospitals, schools and shopping areas with active travel routes, the Act will encourage people to rely less on their cars when making short journeys and make implementing successful Travel Plans easier.

Active Travel Act Guidance (July 2021)

- 3.23 The Active Travel Act Guidance was first published in July 2021 and is issued using the powers of the Welsh Ministers to give guidance under sections 2(6), 2(9), 3(4), 4(5), 5(2) and 7(2) of the Active Travel Act.
- 3.24 The act requires local authorities in Wales to produce maps of walking and cycling networks, and to deliver year on year active travel improvements along the mapped routes and their related facilities. These routes should be coherent, direct, safe, comfortable and attractive. The maps shall now be known as Active Travel Network Maps (ATNM) – showing existing routes and future routes which shall combine the Existing Routes Map and the Integrated Network Map required by the act.
- 3.25 The active travel network is designed to serve everyday journeys. These are also known as utility journeys – trips with a purpose rather than purely for leisure. Examples of destinations which can be considered to form an everyday or utility journey include; school or other educational establishments, local shops, employment sites, healthcare facilities, and other destinations people travel to for a purpose.
- 3.26 **Figure 3.3** is an extract of Table 4.1 within the guidance which provides a guide for network development in relation to reasonable distances that would be travelled by each respective mode for everyday journeys.

Figure 3.3 – Active Travel Guidance Table 4.1

	Less than 1km	Up to 3km	Up to 5km	Up to 8km	Up to 12km	Up to 24km
	Many users	Many users	Some users	Few users	Few users	Few users
	Many users	Many users	Many users	Many users	Some users	Few users
	Many users	Many users	Many users	Many users	Some users	Some users

- 3.27 Two out of every three journeys are less than five miles in length – an achievable distance to cycle for most people, with many shorter journeys also suitable for walking. For school children the opportunities are even greater: three quarters of children live within a 15-minute cycle ride of a secondary school, while more than 90% live within a 15-minute walk of a primary school.

- 3.28 The guidance further states that developments that do not adequately make provision for walking and cycling should not be approved. This may include adequate off-site improvements for pedestrians and cyclists using existing highways that are affected by the development. The site has the potential to provide excellent pedestrian links allowing for residents of the site to connect with the local area, as well as providing active travel benefits for the existing community.

Well-being of Future Generations (Wales) Act (April 2015)

- 3.29 Wales faces a number of challenges now and in the future, such as climate change, poverty, health inequalities and jobs and growth.
- 3.30 The Well-being of Future Generations Act puts in place seven well-being goals that will help to tackle these challenges. The Act makes it clear the listed public bodies must work to achieve all of the goals, not just one or two.
- 3.31 In terms of the impact of the goals on develop and travel, the first goal of 'A Prosperous Wales' recognises the need for an innovative, productive and low carbon society and is somewhat all-encompassing of the other goals and the need for sustainable travel options and low carbon communities.



South East Wales Strategic Development Plan

- 3.32 The Welsh Government published Future Wales: The National Plan 2040 in February making it the first ever national development plan in the United Kingdom. All Strategic Development Plans (SDPs) and Local Development Plans (LDPs) prepared in Wales now have to be in general conformity with Future Wales.
- 3.33 Following its release, the South East Wales SDP is due to be the first SDP to formally commence preparation in February 2022. This will introduce a tier of regional planning to address matters transcending Local Authority boundaries.
- 3.34 Most local authorities are currently in the process of reviewing their LDPs and are at different stages in the process of preparation; with tighter phosphate target levels in Special Areas of Conservation set by Natural Resources Wales causing delays to several reviews.
- 3.35 It is proposed that SDP's will allow "larger than local issues such as housing numbers, strategic housing allocations, strategic employment sites, strategic green infrastructure routes, supporting transport infrastructure which cuts across a number of LPA areas to be considered and planned for in an integrated and comprehensive way."

Vale of Glamorgan Local Development Plan 2011-2026

- 3.36 The presently adopted Local Development Plan (LDP) provides an overview of the local planning policies against which future development is assessed. Whilst a Replacement LDP is in the process of being prepared, it is considered that the existing adopted LDP provides a suitable base against which to consider the proposals.
- 3.37 The LDP includes a number of key strategic objectives to steer development within VoG, of particular relevance are the following:
- Develop sustainable communities with opportunities for living, working, learning and leisure for all.
 - Ensure development makes a positive contribution towards lowering the impacts of climate change.
 - Reduce the need for residents to travel and provide greater access to more sustainable modes of transport.
- 3.38 The site is well located to form a natural extension to the existing waterfront development in Barry, enhancing the existing community with facilities such as the incubation hub and supporting marina facilities.

Summary

- 3.39 The principles of the development proposals comply with the transport related planning policies discussed within this chapter.
- 3.40 The site benefits greatly from its location with bus stops within a 6 minute walk and Barry railway station within a 15 minute walk, as well as being within a comfortable walking / cycling distance of employment, retail and residential areas.
- 3.41 Therefore, at the heart of the Barry Waterfront development, the site will seek to reduce the need to travel in the first instance with more sustainable modes of transport promoted for journeys beyond the site. This will be aided through design and continued promotion of the transport hierarchy placing pedestrian and cycle movements at the forefront of all development.

4 Development Proposals

Overview

4.1 The development proposals comprise the following:

- creation of a 400-berth marina with floating pontoons. A Marina development comprising a 520 sqm office building including a restaurant;
- A 29,000 sq ft (2,694 sqm) incubator workspace building comprising offices, smart innovation space, break-out space and a café;
- Residential development comprising 45 x three and four bedroom townhouses and 20 x one and two bedroom apartments with a maximum height of 4 storeys;
- Access road and car parking;
- Landscaping and public open space/park;
- Engineering works to raise the existing ground levels to a minimum of 9.00m AOD in order to mitigate against flood risk.

Site Layout

4.2 The site layout is demonstrated in **Figure 4.1** and a copy of the site masterplan is provided in **Appendix C**.

Figure 4.1 – Site Layout



Placemaking

- 4.3 The masterplan has been developed to accord with the principles of placemaking as set out within the Future Wales Act.
- 4.4 The National Plan 2040 states that 'the growth aspirations of Future Wales are an opportunity to regenerate our towns and cities and shape their extent, structure and density. Placemaking is at the heart of the planning system in Wales and this policy establishes a strategic placemaking approach and principles to support planning authorities to shape urban growth and regeneration'.
- 4.5 The site strongly accords with these aspirations and placemaking principles, including:
- creating a rich mix of uses;
 - providing a variety of housing types and tenures;
 - building places at a walkable scale, with homes, local facilities and public transport within walking distance of each other;
 - increasing population density, with development built at urban densities that can support public transport and local facilities;
 - establishing a permeable network of streets, with a hierarchy that informs the nature of development;

Marina

- 4.6 The development includes the creation of a 400-berth marina with floating pontoons. The pontoons are located to the north, east and west of the peninsula with the pontoons fixed to the site at regular intervals.
- 4.7 A slipway is provided on the eastern end of the peninsula. This is however retained from the existing site and a purpose built facility is being delivered on the eastern side of the dock, to the south of David Davies Road. The boats will remain in the water for the large part of any one year, and when needed to be removed from the water will be removed from the dock through the hoist and stored in the boat yard on the opposite side of the marina.
- 4.8 The onsite slip is proposed to be used infrequently for smaller craft and personal Watersports such as Stand Up Paddle boarding (SUP) and kayaks of marina members and residents.

Restaurant

- 4.9 Linked to the Marina operation, a 520 sqm office building is proposed which includes a restaurant.

Office Space

- 4.10 The site includes a 2,694 sqm incubator workspace building comprising offices, smart innovation space, break-out space and a café.

Residential

- 4.11 The residential element on the site comprises 45 no. three and four bedroom townhouses and 20 no. one and two bedroom apartments with a maximum height of 4 storeys.
- 4.12 The town houses are located in seven terraces across the site, front east, west and north.
- 4.13 On the western end of the site, a block of flats is proposed which provides 20 no. one and two bedroom apartments.

Access

- 4.14 Access to the site is provided via Neptune Road to the west. Neptune Road in turn connects to Ffordd y Mileniwm and Hood Road junction at a signalised junction. This access forms the primary access route into and out of the site.
- 4.15 The central access road is proposed to include raised table features at the priority junctions with the residential cul-de-sacs within the site. These are designed as traffic calming measures to reduce traffic speeds along this route to 20 mph or below. A raised table concept layout is shown in **Vectos Drawing: 226956_PD02 Proposed Traffic Calming** a copy of which is provided in **Appendix D**.

Pedestrians

- 4.16 Pedestrian access is provided at two locations as follows:
 - Adjacent to the carriageway of Neptune Road
 - At the southwestern corner of the site connecting through to the Barry Waterfront development (subject to a corresponding offsite connection).

Cyclists

- 4.17 Access for cyclists is provided via the main access route into and out of the site. This access route will be signed at a maximum of 20 mph.

Cycle Parking

- 4.18 Cycle parking details are contained within the VoG Parking Standards by land use type. These Parking Standards include both car and cycle parking. The Parking Standards Supplementary Planning Guidance (SPG) forms part of the VoG Local Development Plan (2011 – 2026) January 2019.
- 4.19 The relevant cycle parking standards and the proposed provision at this stage is provided in **Table 4.1**.

Table 4.1 – VoG Selective Cycle Parking Standards (January 2019)

Land Use	Standards	Cycle Parking Provision
Residential Houses & Apartments	Apartments Long Stay – 1 stand per 5 bedrooms Short Stay – no requirement.	4 – 8 spaces (depending on 1 & 2 bedroom mix)
Offices	Long Stay - 1 stand per 200 sqm Short Stay – 1 stand per 100 sqm	Long Stay – 13 spaces Short Stay – 27 spaces
Restaurants & Cafes (All types)	Long Stay - 1 stand per 10 staff Short Stay – no requirement	Expected 1 – 2 spaces.
Marinas (Leisure Clubs & Sports Clubs)	Long Stay - 1 stand per 10 staff 1 stand per 10 facility users	Expected 40 spaces

Details: Office provides 2,694 sqm

- 4.20 The residential cycle parking will be accommodated within individual gardens for the houses, while a central cycle store will be provided as part of the apartment block.
- 4.21 For the office, restaurant, café and marina, cycle parking will be provided as a mixture of within the building ground floor and curtilage for the short and long stay elements. The 82 cycle parking spaces required could be accommodated on 41 Sheffield style stands, with each stand able to accommodate two cycles.

Parking

- 4.22 Parking is proposed as follows:
- **Marina and office** - car park located between the marina and office building and adjacent to the site access road.
 - **Residential** - in a parking court for the flats and adjacent to internal roads within the site.
- 4.23 The vehicle parking standards are provided by zone with the site falling into ‘Zone B Urban’ which is defined as follows:
- ‘Zone B Urban - very much part of a substantial built up area with a number of basic local facilities within 400m walking distance. A range of bus routes offering up to 6 buses per hour; the range of destinations offering practical access to most but not all essential facilities. The curtilage of the site

restricts, to an extent, what car parking can be provided. There are likely to be some restrictions on on-street parking and other available off-street parking is severely limited or non-existent’.

- 4.24 The parking standards set out are maximum parking standards and further context provided with the standards state that ‘*an appropriate level of car parking is integrated in a way which does not dominate the development*’. The relevant parking standards and the proposed parking provision is provided in **Table 4.2**.

Table 4.2 – VoG Selective Parking Standards (January 2019)

Land Use	Standards	Parking Provision
Residential	<i>Zones A - E</i>	Houses & flats: 65
Houses & Apartments	Residents - 1 space per bedroom (maximum requirement 3 spaces) Visitors - 1 space per 5 units	Parking: 65 spaces (one space per unit) Visitor: 13 spaces
Offices (>1,000 sqm)	<i>Zones A – B</i> 1 space per 60 sqm	130 parking spaces
Restaurants	<i>Zones A – C</i> Operational: 1 commercial vehicle space Non Operational: 1 space per 3 non-resident staff & 1 space per 7 sqm of dining area	
Marinas	<i>All Zones</i> Operational – 1 car and trailer space Non- operational - 1 space per berth	
Total		208 spaces

Details: Vale of Glamorgan Local Development Plan (2011 – 2026) Supplementary Planning Guidance (SPG) January 2019

Residential Parking

- 4.25 The level of parking across the site is proposed at a rate of one space per dwelling for the residential element plus 16 visitor parking spaces at a rate of one space per five units.
- 4.26 The residential parking ratio of 1:1 reflects the accessibility of the location and the broad range of facilities provided within a short walking distance, reducing the need for car ownership. Comparison

to the 2021 Census car availability data shows that the majority of households in central Barry either have no car or one car in their household.

- 4.27 Within the MSOA that the site is located, the number of households with no car or one car in the household is 57% for the Whole house or bungalow category or and 89% for the Flat, maisonette, apartment category.
- 4.28 This analysis of the 2021 Census demonstrates that the majority of households in this central location within Barry either do not have a car or have one car only and as such the proposed parking ratio aligns with wider car ownership patterns locally as well as reducing reliance on private car ownership.

Office, Restaurant and Marina Parking

- 4.29 The level of parking for the office, restaurant and marina has been set accounting for and balancing a range of different elements and factors.
- 4.30 The Yacht Harbour Association Ltd Code of Practice for the Design and Construction of Marinas and Yacht Harbours, provides recommendations on parking levels. This guidance states that requirements for car parking vary based on a variety of factors including boat mix, market and location. The highly accessible location of the site should also be taken into consideration.
- 4.31 The guidance recommends 0.33 to 0.5 car parking spaces per berth as a maximum.
- 4.32 The marina parking proposed includes a proportion of spaces that will be shared with the office accommodation. It is considered that this arrangement with shared parking complements the different uses across the site well. The demand for marina parking will typically be lower during weekdays when demand for office parking is highest. Conversely during periods of higher marina demand such as at weekends, the office demand will be limited. This will provide a dynamic and efficient use of parking spaces across the site.
- 4.33 For the marina, restaurant and office element, a total of 130 parking spaces are proposed. This level of parking is lower than the maximum vehicle standards of 454 spaces for the marina and office element. However, the overall accessibility of the site by active travel modes and by public transport support the approach of lower parking levels being taken. The level of parking is also reflective of the constrained nature of the site and also to avoid the development being overly dominated by parking.
- 4.34 The level of parking across the site has been reached balancing a number of different aspects and considerations. The high level of accessibility to the site provided by nearby bus services and rail connections will reduce reliance on single occupancy private car trips.
- 4.35 Future occupiers of the residential element will be located in an area with a wide range of local facilities provided within a reasonable walking distance of the site. This includes emerging development such as the Ysgol Gymraeg Sant Baruc Welsh language primary school which is likely to provide a key destination from the residential element of the development. The close proximity of this and other local amenities provides a range of opportunities for local travel to be undertaken on foot and reduces the need for private car ownership.

Disabled Parking

- 4.36 Disabled parking is proposed in line with standards with 5% of the total car park capacity designated (to include both employees and visitors).
- 4.37 For the marina and restaurant elements, 6% of the total car park capacity is proposed for visiting disabled people. The standards also state that a minimum of one space for each employee who is disabled should be provided. Given the development is yet to be consented, it is not practicable to assume the level of disabled employees working at the site.

Electric Vehicle Charging

- 4.38 For new residential development proposals, VoG Council encourage developers to provide Electric Vehicle Charging Points (EVCP) wherever appropriate at a ratio of 10% of all parking spaces provided.
- 4.39 For non-residential land uses, a threshold approach is taken with land uses exceeding the thresholds set out in the SPG requiring each land use to provide active EVCPs to the Office for Low Emission Vehicles (OLEV) technical specifications. This equates to at least 10% of car parking spaces, which shall be a 'Fast' charge point type.
- 4.40 For reference, the relevant thresholds are provided as follows:
- Leisure facilities including hotels - > 1,000sq.m gross floor area
 - Business - > 2,500sq.m gross floor area

Delivery and Servicing

- 4.41 The site will require access by a range of delivery and serving vehicles.
- 4.42 Through consultation with VoG Council, the functionality of the site masterplan has been tested through swept path analysis for the range of vehicles that are routinely expected to access the site as well as emergency vehicles. Swept path analysis is being undertaken for the following:
- Refuse collection vehicle.
 - Fire Tender and Aerial Ladder Platform.
 - Standard Design Vehicle (SDV) and 7.5t panel van (two way passing).
- 4.43 Copies of these drawings are provided in **Appendix D**.

5 Trip Generation

Overview

5.1 This chapter sets out the approach to trip generation for the proposed development. The development comprises various elements and trip generation has been undertaken for the following:

- A **residential development** comprising 45 x three and four bedroom townhouses and 20 x one and two bedroom apartments with a maximum height of 4 storeys, providing 65 units in total;
- a **400-berth marina**, including 520 sqm marina building with associated food / drink outlet;
- A 29,000 sq ft (2,694 sqm) **incubator workspace building** comprising offices, smart innovation space, break-out space and a café.

Trip Rates

Residential

5.2 The total people trip rates have been obtained from the TRICS database, with a copy of the TRICS output report provided in **Appendix E**.

5.3 The selection criteria were as follows:

- | | |
|----------------------|--|
| — Land Use | 03 - RESIDENTIAL |
| — Category | A – HOUSES PRIVATELY OWNED |
| — Type | MULTI-MODAL VEHICLES |
| — Location | UK (EXCLUDING NI & GREATER LONDON) |
| — Units | 20-100 Units |
| — Days Selected | Monday – Friday |
| — Selected Locations | Suburban Area, Edge of Town |
| — Date Range | 01/01/2014 – 19/11/2021 (excluding Covid19 affected surveys) |

5.4 The peak period residential person trip rates are provided in **Table 5.1**.

Table 5.1 – Residential Total People Trip Rates (per dwelling)

Period	Time	Arrivals	Departures	Total
AM Peak hour	07:00 - 08:00	0.119	0.544	0.663
	08:00 - 09:00	0.232	0.803	1.035
	09:00 - 10:00	0.252	0.321	0.573
PM Peak Hour	16:00 - 17:00	0.540	0.292	0.832
	17:00 - 18:00	0.565	0.278	0.843
	18:00 - 19:00	0.441	0.238	0.679

5.5 The resulting person movements based on 65 dwellings is provided in **Table 5.2**.

Table 5.2 - Total Person Movements (65 dwellings)

Period	Time	Arrivals	Departures	Total
AM Peak hour	07:00 - 08:00	8	35	42
	08:00 - 09:00	15	51	66
	09:00 - 10:00	16	21	37
PM Peak Hour	16:00 - 17:00	35	19	53
	17:00 - 18:00	36	18	54
	18:00 - 19:00	28	15	43

Journey Purpose

- 5.6 The National Travel Survey (NTS) has been utilised to obtain a breakdown of the proportion of trips per journey purpose per hour. The NTS consists of face-to-face interviews and a seven-day self-completed written travel diary, thereby allowing trips to be broken down by journey purpose and in some instances, mode split of trips per purpose.
- 5.7 The NTS splits journeys into 8 categories as follows; commuting, business, education, escort education, shopping, other work / escort & personal business, visiting friends / entertainment / sport, and, holiday / day trip / other. As such, these trips have been classified into four general categories of commuting, education, retail, and leisure.
- 5.8 A summary of the proportional split of trips by journey purpose, based on the four categories outlined above, is provided in **Table 5.3** with reference to the morning and evening 3-hour peak periods and for a 12-hour period (07:00-19:00).

Table 5.3 - Journey Purpose by Time Period

Time Period	Commuting	Education	Retail	Leisure
07:00-08:00	53%	20%	3%	24%
08:00-09:00	23%	51%	4%	22%
09:00-10:00	16%	10%	22%	52%
16:00-17:00	26%	11%	15%	48%
17:00-18:00	36%	5%	12%	47%
18:00-19:00	24%	2%	15%	59%
12-hour	22%	17%	17%	45%

5.9 Application of the NTS proportions in **Table 5.3** have been undertaken to the person movements in **Table 5.2**. The resulting person movements by journey purpose are provided in **Table 5.4**.

Table 5.4 – Person Movements by Journey Purpose

Time Period	Commuting		Education		Leisure / Recreation		Retail	
	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep
07:00 – 07:59	4	19	2	7	2	8	0	1
08:00 – 08:59	3	12	8	26	3	11	1	2
09:00 – 09:59	3	3	2	2	8	11	4	5
16:00 – 16:59	9	5	4	2	17	9	5	3
17:00 – 17:59	13	6	2	1	17	8	4	2
18:00 – 18:59	7	4	1	0	17	9	4	2
12 hr	56	58	43	45	117	122	44	45

Mode Splits

5.10 Mode share details are provided by land use as follows:

- Commuting (Travel to Work) – **Table 5.5**
- Education – **Table 5.6**
- Retail and Leisure – **Table 5.7**

5.11 The 2011 Census has been interrogated to find the mode split of commuting trips for the MSOA in which the site sits (The Vale of Glamorgan 015). This mode split for the VoG 015 MSOA is demonstrated in **Table 5.5**.

Table 5.5 – Travel to Work Mode Split VoG 015 (from 2011 Census)

Mode	Percentage Split
Train	9%
Bus, Minibus or Coach	2%
Taxi	1%
Motorcycle, Scooter or Moped	0%
Driving a Car or Van	70%
Passenger in a Car or Van	6%
Cycling	1%
Walking	9%
Other Method of Travel	1%
Total	100%

- 5.12 For education, professional judgement has been made with assumptions based on the nearest primary school (450m away) and the nearest secondary school (2.7km away). The mode share for primary and secondary education is provided in **Table 5.6**. For comparison, data from the NTS has also been included using *NTS Table 614 - Trips to and from school by main mode, trip length and age*. This comparison shows broadly similar mode splits for both primary and secondary although given the close proximity of the local primary school to the site, a higher walking mode share is expected than the NTS data might indicate.
- 5.13 It is expected, as demonstrated in **Table 5.6**, that the majority of primary school trips will be undertaken by foot due to the proximity of the nearest primary schools. Similarly, the secondary school most split is based on the location of the nearest schools as well as catchment areas for bus travel.

Table 5.6 – Education Mode Split

Mode	Percentage Split	NTS Comparison
Primary School		Primary (Under 1 mile)
Walk	90%	81%
Cycle	5%	1%
Car	5%	18%
Total	100%	100%
Secondary School		Secondary (Under 2 miles)
Walk	60%	47%
Cycle	10%	10%
Car	20%	30%
Bus, Minibus or	10%	12%
Total	100%	100%

- 5.11 To provide mode share splits for the other journey purposes, NTS Table 409 has been used which provides the 'Average number of trips (trip rates) by purpose and main mode'.

- 5.14 Application of these mode share percentages has been applied to the remaining journey purpose categories (retail and leisure) as set out in **Table 5.3** which replicates the mode share from NTS Table 409a whilst grouping together of similar modes has been undertaken in a consolidated version.

Table 5.7 – Retail and Leisure Mode Share (based on NTS Table 409a)

Method of Travel to Work	Retail	Leisure
Train	1%	3%
Bus, Minibus or Coach	6%	4%
Taxi	1%	2%
Motorcycle, Scooter or Moped	0%	0%
Driving a Car or Van	47%	38%
Passenger in a Car or Van	19%	33%
Cycling	1%	2%
Walking	25%	16%
Other Method of Travel to Work	0%	0%
Total	100%	100%

- 5.15 These mode shares have been applied to the person movement by purpose from **Table 5.4**.

Total Residential Trips

- 5.16 The predicted multi-modal trips for the proposed development of 65 dwellings is demonstrated in **Table 5.8**.

Table 5.8 – Forecast Trip Rates (65 Dwellings)

Total	AM (08:00-09:00)		PM (17:00-18:00)	
	Arrivals	Departures	Arrivals	Departures
Train	0	1	1	1
Bus, minibus or coach	1	3	2	1
Taxi	0	0	0	0
Motorcycle, scooter or moped	0	0	0	0
Driving a car or van	6	21	25	12
Passenger in a car or van	2	6	7	4
Bicycle	1	2	1	0
On foot	8	27	11	6
Other method of travel to work	0	0	0	0
Total	17	60	49	24

Office

- 5.17 For the office use, the total people trip rates have been obtained from the TRICS database, with a copy of the TRICS output report provided in **Appendix E**.

5.18 The selection criteria were as follows:

- Land Use 02 - EMPLOYMENT
- Category A – OFFICE
- Type MULTI-MODAL VEHICLES
- Location UK (EXCLUDING NI & GREATER LONDON)
- GFA 1,230 to 11,250 sqm
- Days Selected Monday – Friday
- Selected Locations Suburban Area, Edge of Town, Edge of Town Centre
- Date Range 01/01/2014 – 14/03/2019

5.19 The peak period office person trip rates are provided in **Table 5.9**.

Table 5.9 – Office Total People Trip Rates (per 100sqm)

Period	Time	Arrivals	Departures	Total
AM Peak hour	07:00 - 08:00	0.681	0.065	0.746
	08:00 - 09:00	2.590	0.216	2.806
	09:00 - 10:00	2.009	0.446	2.455
PM Peak Hour	16:00 - 17:00	0.387	1.395	1.782
	17:00 - 18:00	0.181	2.404	2.585
	18:00 - 19:00	0.070	0.795	0.865

5.20 The resulting person movements based on 2,694sqm of office space is provided in **Table 5.10**.

Table 5.10 - Total Person Movements (2,694sqm)

Period	Time	Arrivals	Departures	Total
AM Peak hour	07:00 - 08:00	18	2	20
	08:00 - 09:00	70	6	76
	09:00 - 10:00	54	12	66
PM Peak Hour	16:00 - 17:00	10	38	48
	17:00 - 18:00	5	65	70
	18:00 - 19:00	2	21	23

Mode Splits

- 5.21 The 2011 Census has been interrogated to find the mode split of commuting trips into the MSOA in which the site sits (The Vale of Glamorgan 015). This mode split for the VoG 015 MSOA is demonstrated in **Table 5.11**

Table 5.11 – Travel to Work Mode Split VoG 015 (from 2011 Census)

Mode	Percentage Split
Train	2%
Bus, Minibus or Coach	3%
Taxi	0%
Motorcycle, Scooter or Moped	1%
Driving a Car or Van	74%
Passenger in a Car or Van	7%
Cycling	2%
Walking	10%
Other Method of Travel	1%
Total	100%

Total Office Trips

- 5.22 The predicted multi-modal trips for the proposed development of 2,694sqm of office space, is demonstrated in **Table 5.12**.

Table 5.12 – Office Multi-modal Movements (2,694sqm)

Mode	AM (08:00-09:00)		PM (17:00-18:00)	
	Arrivals	Departures	Arrivals	Departures
Train	6	1	0	6
Bus, minibus or coach	2	0	0	1
Taxi	0	0	0	0
Motorcycle, scooter or	0	0	0	0
Driving a car or van	49	4	3	45
Passenger in a car or van	4	0	0	4
Bicycle	1	0	0	1
On foot	6	1	0	6
Other method of travel to	1	0	0	1
Total	70	6	5	65

Marina and Restaurant

5.23 For the Marina use, with associated facilities including food and drink retail, the total vehicle trip rates have been obtained from the TRICS database, with a copy of the TRICS output report provided in **Appendix E**. Total people trip rates were not available.

5.24 The selection criteria were as follows:

- Land Use 08 - MARINAS
- Category A – MARINAS
- Type TOTAL VEHICLES
- Location UK (EXCLUDING NI & GREATER LONDON)
- Berths 125 to 500 units
- Days Selected Saturday - Sunday
- Selected Locations All Locations Selected
- Date Range 01/01/2011 – 27/06/2021 (excluding surveys affected by Covid 19)

5.25 The TRICS database does not include any appropriate weekday trip rates within the database. Out of the sample of 49 Marina sites, only two surveys were undertaken on a weekday. The two surveys were undertaken in 1991 and 1995 and therefore not considered appropriate. As such a sample of TRICS sites has been taken from the weekend database.

5.26 The peak period total vehicle trip rates are provided in **Table 5.13**.

Table 5.13 – Marinas Total Vehicle Trip Rates (per berth)

Period	Time	Arrivals	Departures	Total
AM Peak hour	07:00 - 08:00	0.015	0.011	0.026
	08:00 - 09:00	0.037	0.023	0.060
	09:00 - 10:00	0.071	0.035	0.106
PM Peak Hour	16:00 - 17:00	0.066	0.129	0.195
	17:00 - 18:00	0.057	0.092	0.149
	18:00 - 19:00	0.037	0.060	0.097

5.27 The resulting person movements based on 400 berths is provided in **Table 5.14**.

Table 5.14 - Total Vehicle Movements (400 berths – Weekend)

Period	Time	Arrivals	Departures	Total
AM Peak hour	07:00 - 08:00	2	4	10
	08:00 - 09:00	15	9	24
	09:00 - 10:00	28	14	42
PM Peak Hour	16:00 - 17:00	26	52	78
	17:00 - 18:00	23	37	60
	18:00 - 19:00	15	24	39

5.28 It is noted that, unlike residential and employment related trips, trips associated with a marina use are dependent on a wide variety of factors including:

- Weekend or Weekday;
- Time of year (i.e., summer / winter);
- Weather (including temperature and wind speed);
- Organised events.

5.29 In the absence of appropriate weekday data being available within the TRICS database, a weekday factor has been considered and applied to the weekend trip rates.

5.30 A factor of 0.25 has been identified and applied to the weekend trips. This is based on number of factors as considered above, and also takes into account the discussions held between the applicant and Marina experts as part of the site appraisal and business case.

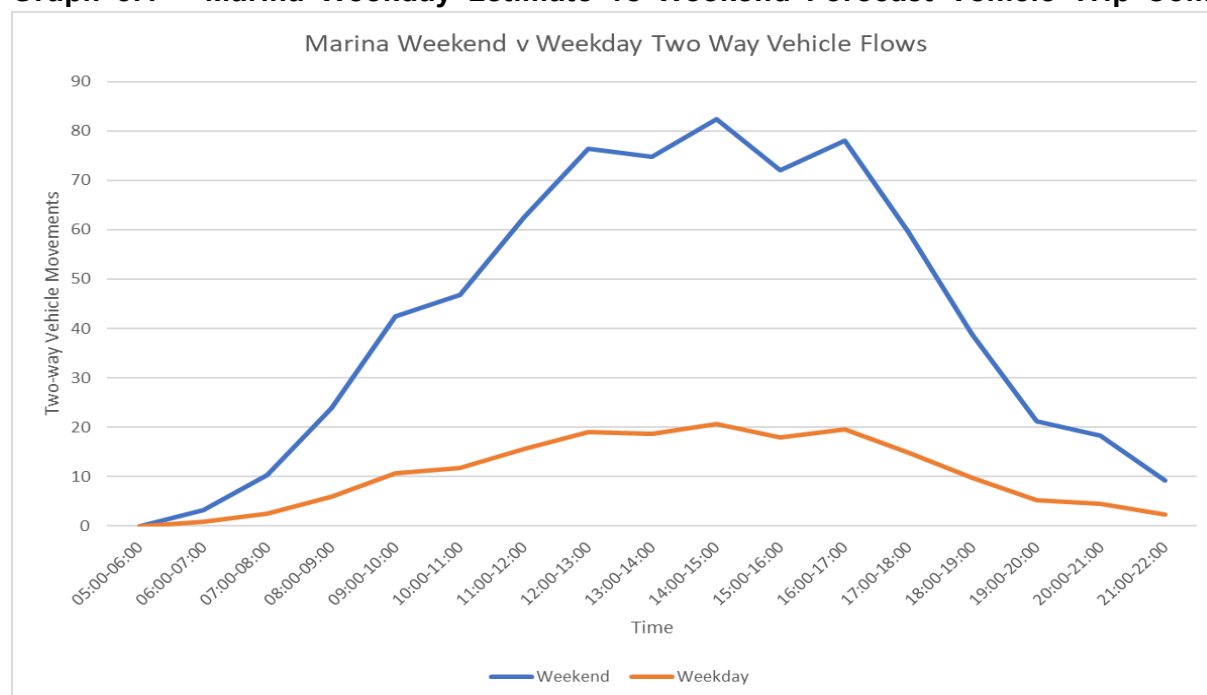
5.31 The weekday trips, with the 0.25 factor applied to the weekend trips in **Table 5.14**, are demonstrated in **Table 5.15**.

Table 5.15 - Total Vehicle Movements (400 berths – *estimated* Weekday)

Period	Time	Arrivals	Departures	Total
AM Peak hour	07:00 - 08:00	2	1	3
	08:00 - 09:00	4	2	6
	09:00 - 10:00	7	4	11
PM Peak Hour	16:00 - 17:00	7	13	20
	17:00 - 18:00	6	9	15
	18:00 - 19:00	4	6	10

5.32 **Graph 5.1** demonstrates the difference in the daily profile between weekend and weekday trips, using the 0.25 factor.

Graph 5.1 – Marina Weekday Estimate vs Weekend Forecast Vehicle Trip Comparison



Summary

5.33 The forecast total people trip generation for the full site, by all modes, is demonstrated at **Table 5.16**.

Table 5.16 – Full Development Forecast Trips

Mode	AM (08:00-09:00)			PM (17:00-18:00)		
	Arr	Dep	Two-Way	Arr	Dep	Two-Way
Train	7	2	9	2	7	9
Bus, minibus or coach	2	3	5	2	3	5
Taxi	0	0	1	0	1	1
Motorcycle, scooter or moped	0	0	0	0	0	0
Driving a car or van	59	28	86	34	67	101
Passenger in a car or van	6	6	12	8	7	15
Bicycle	2	2	4	1	1	2
On foot	14	27	41	12	11	23
Other method of travel to work	1	0	1	0	1	1
Total	91	68	159	59	98	157

- 5.34 **Table 5.16** demonstrates that on a typical weekday the development is forecast to generate 159 two-way total people movements in the AM peak and 157 two-way total people movements in the PM peak. Of these movements, there are expected to be 86 and 101 two-way vehicle movements in the AM and PM peaks respectively.
- 5.35 There are a large proportion of trips forecast to be undertaken by sustainable modes, which reflects the good location of the site and its distance from local facilities includes shops, restaurants, employment areas and public transport.

6 Distribution & Assignment

Overview

- 6.1 This chapter sets out the approach to distribution and assignment of vehicle trips across the local highway network.
- 6.2 The approach to distribution and assignment has been undertaken for the different land uses as follows:
 - **Marina and Offices** - 2011 Census Journey to Work inbound trips to the VoG 015 MSOA
 - **Residential** – 2011 Census Journey to Work for residents living in the VoG 015 MSOA and working elsewhere.

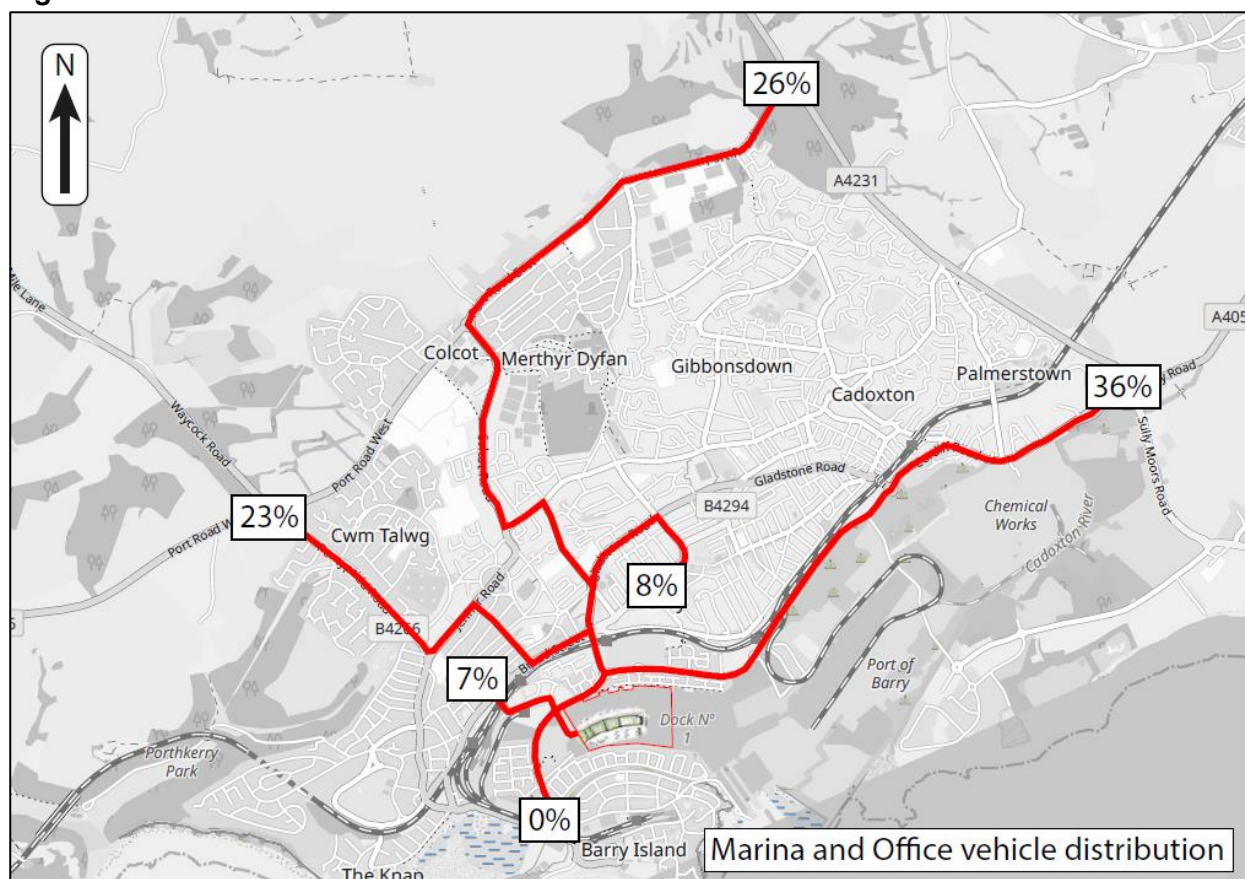
Marina & Office

- 6.3 The 2011 Census data has been investigated in order to determine the distribution of vehicle trips into the site, based on the 'WU03EW - Location of usual residence and place of work by method of travel to work (MSOA level)' records.
- 6.4 This exercise has been undertaken in order to determine routes that vehicle trips generated by the office and marina uses on the site will take, allowing for the consideration of surrounding junctions.
- 6.5 Given the large catchment area for the Marina, it is expected that the majority of trips will access Barry via the Strategic Road Network (SRN), with an element routing locally. Vehicle movements to the Marina have therefore also been considered using the same distribution as employment trips for robustness.
- 6.6 The MSOA used as the destination for this distribution exercise is 'The Vale of Glamorgan 015', the MSOA in which the site resides. The origin MSOAs include every MSOA within England and Wales.
- 6.7 All vehicle trips have been distributed using the online Google Maps 'Directions' tool, and professional judgement has been applied to routing closer to the site. On occasions when two or more routes could be taken to a destination, routing has been split equally.
- 6.8 A summary of routes is detailed in **Table 6.1** and illustrated in **Figure 6.1**.

Table 6.1 – Marina and Office Distribution

Route ID	Route			Census Trips	Percentage
A	Town Centre	Gladstone Bridge	Ffordd Y Mileniwm Southwest-bound	165	8%
	A4055 Southbound			535	26%
	A4055 Eastbound			461	23%
	Ffordd Y Mileniwm Northeast-bound			718	36%
B	Ffordd Y Mileniwm Southwest-bound			0	0%
C	Hood Road			136	7%
	Total			2,015	100%

Figure 6.1 – Marina and Office Distribution Routes



Residential Trip Distribution

- 6.9 For the residential element, the MSOA used as the point of origin is 'The Vale of Glamorgan 015', the MSOA in which the site resides. The destination MSOAs include every MSOA within England and Wales.

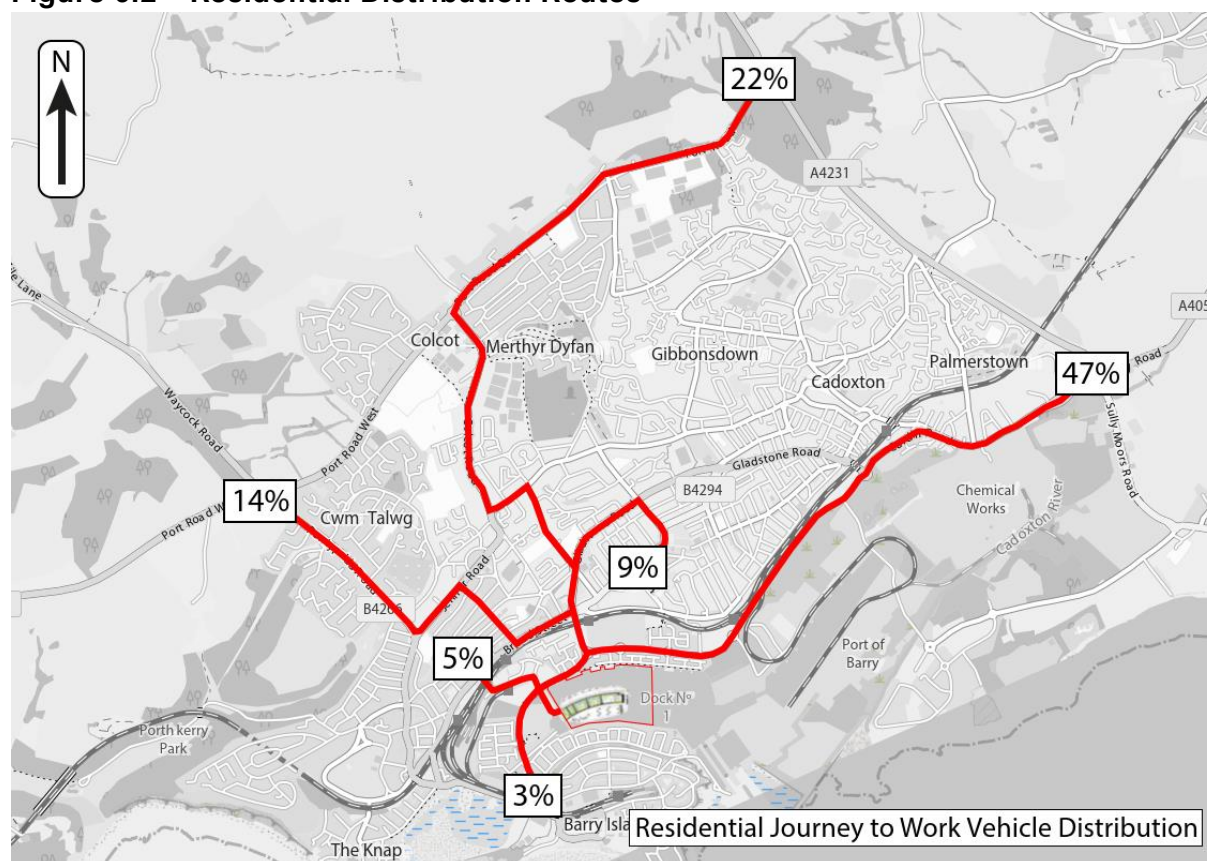
- 6.10 The trip distribution has been initially categorised into vehicles travelling northeast-bound and southwest-bound from the site access along Ffordd Y Mileniwm, or directly north to Hood Road. Following this, the traffic has been distributed via the nearest adjoining roads.
- 6.11 All vehicle trips have been distributed using the online Google Maps 'Directions' tool, and professional judgement has been applied to routing closer to the site. As per the office and marina distribution, on occasions when two or more routes could be taken to a destination, trips have been split equally between the routes.
- 6.12 The distribution is demonstrated in **Table 6.2**, clearly setting out the split between Ffordd Y Mileniwm northeast-bound, southeast-bound and Hood Road.

Table 6.2 – Residential Distribution

Route ID	Route			Census Trips	Percentage
A	Ffordd Y Mileniwm Northeast-bound	Gladstone Bridge	Town Centre	206	9%
			A4055 North	492	22%
			A4055 West	331	14%
		Ffordd Y Mileniwm Northeast-bound		1,085	47%
B	Ffordd Y Mileniwm Southwest-bound			70	3%
C	Hood Road			103	5%
	Total			2287	100%

- 6.13 As demonstrated, nearly all traffic has been distributed northeast-bound along Ffordd Y Mileniwm, with the remaining 8% divided between Ffordd Y Mileniwm southwest-bound (3%) and Hood Road (5%).

Figure 6.2 – Residential Distribution Routes



Development Traffic Flows

- 6.14 The peak hour traffic flows for the AM (08:00 – 09:00) and PM (17:00 – 18:00) are illustrated in traffic flow diagrams, copies of which are provided in **Appendix F**.

7 Traffic Effect

Overview

- 7.1 In order to consider the effect of the traffic generated by the site on the local highway network, discussions have taken place with VoG to determine a scope of assessment.
- 7.2 Following these discussions, the following junctions have been assessed:
 - Ffordd Y Mileniwm / Hood Road / Neptune Road Signals;
 - Ffordd y Mileniwm / Gladstone Bridge Roundabout
- 7.3 Turning count survey data has been used in order to determine the existing flows at these junctions in order to provide a baseline traffic flow. These surveys took place on Thursday 20th April 2023.
- 7.4 The vehicle trips associated with the proposed development has been distributed through these junctions.
- 7.5 The assessments have been undertaken using ARCADY and LINSIG as appropriate. Full junction modelling output reports are provided in **Appendix G**.
- 7.6 The assessment has been undertaken for the following peak hours:
 - AM weekday peak hour (08:00 – 09:00); and
 - PM weekday peak hour (17:00 – 18:00).

Assessment Scenarios

- 7.7 Assessment scenarios have been considered as follows:
 - **Baseline** - (2023 Traffic Surveys)
 - **Scenario 1** - Future Year (2036)
 - **Scenario 2** - Future Year + Development
- 7.8 TEMPro growth factors have been applied to the baseline survey data to obtain 2036 traffic flows. The main development in the area yet to be built out is the nearby primary school, Ysgol Gymraeg Sant Baruc which whilst completed during the traffic surveys did not open until the 24th April 2023.
- 7.9 The total number of trips generated by the school is less than the increase in the number of trips when applying the TEMPro growth factors to the 2023 traffic survey data. Additionally, the Transport Statement for the school does not indicate where the trips route after joining Ffordd Y Mileniwm.
- 7.10 It is therefore considered a more robust approach to apply the TEMPro growth factors instead of the trips generated by the school.

7.11 Each junction is considered in turn in the following section.

Junction 1 – Ffordd Y Mileniwm / Hood Road / Neptune Road - LinSig

7.12 A LinSig model has been built for the junction to test the different development scenarios.

7.13 The existing signal configuration was requested from the VoG and used to inform the LinSig model. However, the VoG have informed Vectos that an improved signal configuration will be introduced which includes a change to the signal stage sequence. As a signal configuration sheet has not been provided for the improved scheme, the existing signal specification has been used to inform any missing information such as intergreens.

7.14 The improved scheme appears to have been created to remove all priority give way movements. This also allows the junctions to operate the pedestrian facilities alongside the vehicular phases and create a walk-with-traffic sequence and remove the need for an all-red phase for traffic. Overall, this reduces capacity at the junction compared to the existing configuration, but at the benefit of safety by removing the priority give way movements.

7.15 The LinSig modelling results are summarised in **Table 7.1**.

Table 7.1 – Junction 1 Assessment - LinSig

Arm	AM				PM			
	DoS (%)	MMQ (PCU)	Delay (S/PCU)	PRC (%)	DoS (%)	MMQ (PCU)	Delay (S/PCU)	PRC (%)
Baseline (2023 Traffic Surveys)								
Hood Road	66.6	5	59	30.6	83.0	8	71	7.4
Ffordd Y Mileniwm (E)	52.3	5	21		73.3	14	26	
Neptune Road	9.3	1	46		3.9	1	46	
Ffordd Y Mileniwm (W)	68.9	12	30		83.8	16	41	
Scenario 1								
Hood Road	73.6	6	65	18.4	91.4	11	93	-2.4
Ffordd Y Mileniwm (E)	57.5	6	22		80.5	17	29	
Neptune Road	9.8	1	46		4.4	1	46	
Ffordd Y Mileniwm (W)	76.0	14	33		92.1	21	54	
Scenario 2								
Hood Road	75.1	6	66	18.4	91.7	11	95	-2.4
Ffordd Y Mileniwm (E)	57.5	7	22		84.0	19	31	
Neptune Road	24.0	2	49		36.7	2	51	
Ffordd Y Mileniwm (W)	76.0	14	33		92.1	21	54	

7.16 **Table 7.1** demonstrates that the junction is approaching capacity in the future year for the PM peak period, but the development will have a minimal impact on the overall performance of the junction.

The development is forecast to increase queueing by a maximum of 2 Passenger Car Units (PCUs) in the PM peak on Ffordd Y Mileniwm (E) and increase delay by a maximum of 5 seconds on Neptune Road in the PM peak. This is only a minor impact and therefore no mitigation has been considered necessary.

Junction 2 – Ffordd y Mileniwm / Gladstone Bridge Roundabout - ARCADY

- 7.17 The assessment of Junction 2 for the existing operation and future year scenarios is provided in **Table 7.2**.

Table 7.2 – Junction 2 Assessment - ARCADY

Arm	AM (08:00 – 09:00)			PM (17:00 – 18:00)		
	Q (Veh)	Delay (s)	RFC	Q (Veh)	Delay (s)	RFC
	Baseline (2023 Traffic Surveys)					
Gladstone Bridge	1.5	6.16	0.61	1.6	6.52	0.62
Ffordd Y Mileniwm (E)	0.7	4.18	0.42	2.0	7.32	0.67
Ffordd Y Mileniwm (W)	0.7	4.07	0.41	0.9	4.59	0.46
Scenario 1						
Gladstone Bridge	2.1	7.68	0.68	2.3	8.26	0.70
Ffordd Y Mileniwm (E)	0.9	4.62	0.47	2.9	9.72	0.75
Ffordd Y Mileniwm (W)	0.9	4.54	0.47	1.1	5.28	0.52
Scenario 2						
Gladstone Bridge	2.4	8.48	0.71	2.5	9.03	0.72
Ffordd Y Mileniwm (E)	0.9	4.87	0.49	3.2	10.57	0.76
Ffordd Y Mileniwm (W)	0.9	4.71	0.48	1.3	5.86	0.57

- 7.18 It can be seen from **Table 7.2** that the roundabout continues to operate well within its theoretical operating capacity during each of the assessed scenarios in both the AM and PM peak hours. The maximum Ratio of Flow to Capacity (RFC) for any arm is 0.76 with the increase in delay at any approach being less than one second and negligible increases in vehicle queueing between Scenarios 1 and 2.

Summary

- 7.19 The Ffordd y Mileniwm / Gladstone Bridge roundabout continues to operate well within its theoretical operating capacity during each of the assessed scenarios in both the AM and PM peak hours.
- 7.20 The Ffordd Y Mileniwm / Hood Road / Neptune Road signalised junction reaches capacity in the future year for the PM peak period, but the development will have a minimal impact on the overall performance of the junction.

8 Transport Implementation Strategy

Overview

- 8.1 The Welsh Government's Planning Policy Wales Technical Advice Note 18: Transport States that:
- “The transport assessment process should include the production of a ‘Transport Implementation Strategy’ (TIS) for the development. This should set objectives and targets relating to managing travel demand for the development and set out the infrastructure, demand management measures and financial contributions necessary to achieve them. The TIS should set a framework for monitoring the objectives and targets, including the future modal split of transport to development sites”.
- 8.2 This section considers how future residents, marina users, employees and visitors will travel to and from the site and what measures will be put in place to monitor mode split targets.

Access Arrangement

- 8.3 Pedestrian access is provided at two locations as follows:
- Adjacent to the carriageway of Neptune Road
 - At the southwestern corner of the site connecting through to the Barry Waterfront development (subject to a corresponding offsite connection).
- 8.4 Access for cyclists is provided via the main access route into and out of the site. This access route will be signed at a maximum of 20 mph.

Trip Generation

- 8.5 The trip generation expected for the development is provided in **Table 8.1**.

Table 8.1 – Multi Modal Trip Generation Summary

Mode	AM (08:00-09:00)			PM (17:00-18:00)		
	Arr	Dep	Two-Way	Arr	Dep	Two-Way
Train	7	2	9	2	7	9
Bus, minibus or coach	2	3	5	2	3	5
Taxi	0	0	1	0	1	1
Motorcycle, scooter or moped	0	0	0	0	0	0
Driving a car or van	59	28	86	34	67	101
Passenger in a car or van	6	6	12	8	7	15
Bicycle	2	2	4	1	1	2
On foot	14	27	41	12	11	23
Other method of travel to work	1	0	1	0	1	1
Total	91	68	159	59	98	157

- 8.6 The existing (based on the multi modal trip generation) and proposed mode split are shown below in **Table 8.2**. The implementation of the transport strategy including Travel Plan is designed to reduce the mode share for single occupancy car and increase the mode share for public transport and walking.

Table 8.2 – Mode Share Summary

Mode	Existing Mode Split	Proposed Mode Split	Percentage Point Change
Car (Single Occupancy)	61%	55%	-6%
On Foot	18%	20%	+2%
Public Transport	8%	10%	+2%
Bicycle	2%	3%	+1%
Motorcycle	0%	0%	+/-0%
Passenger in a car or in a van	9%	10%	+1%
Taxi	1%	1%	+/-0%
Other	1%	1%	+/-0%
Total	100.0%	100%	+/-0%

Package of Measures

- 8.7 The site will be supported by a range of measures to support accessibility as follows:
- 8.8 The provision of a Travel Plan (TP) which will underpin the development including monitoring of mode share over the course of a 3-year period. The TP will include a range of measures and incentives to support sustainable transport.
- 8.9 This could include discounted public transport tickets, active travel workplace incentives and the provision of an onsite car club.

Summary

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

9 Summary and Conclusion

Summary

- 9.1 This TA has been prepared by Vectos, Part of SLR, on behalf of ABP Dev Co to set out transport and highway matters associated with the proposed redevelopment of land referred to as The Mole, Barry, Vale of Glamorgan, CF62 5BR.
- 9.2 The TA was initially submitted in support of planning application 2023/00051/HYB. It has been updated to address comments provided by VoG officers and their consultants as part of PAC and the planning application statutory consultation.
- 9.3 The proposed development relates to a mixed use scheme comprising the following:
 - The creation of a 400-berth marina with floating pontoons, with an associated 520 sqm marina office building which will include facilities for visitors / members and a restaurant.
 - A 2,694 sqm incubator workspace building comprising offices, smart innovation space, break-out space and a café.
 - Residential development comprising 45 x three and four bedroom townhouses and 20 x one and two bedroom apartments with a maximum height of 4 storeys providing 65 units in total.
- 9.4 The site benefits from its location at the heart of Barry Waterfront, with many facilities accessible via walking and cycling including a supermarket, Goodsheds retail and food court, Barry Waterfront retail park, bus stops and Barry railway station.
- 9.5 The transport strategy for the site seeks to build on the existing links and support future residents and visitors to travel via sustainable modes of transport.
- 9.6 The development proposals align with transport related planning policies at a local and national level. The site is located within a 6 minute walk of local bus stops providing access to a range of local destinations as well as connectivity to Cardiff. Barry railway station is located within a 15 minute walk from the site, while a range of employment, retail, education and health facilities are located in a convenient walking / cycling distance from the site.
- 9.7 The development will seek to reduce the need to travel in the first instance with more sustainable modes of transport promoted for journeys beyond the site. The proposals align with PPW 2021 and Llwybr Newydd – The Wales Transport Strategy (May 2021).
- 9.8 A review of Personal Injury Collision data has been undertaken for the most recently available 5 year period (2017- February 2022 inclusive). This has demonstrated that there are no trends or existing highway safety issues that could be exacerbated by the proposed development.
- 9.9 An assessment of trip generation has been undertaken using the industry standard TRICS database and reflecting the proposed land uses. The development is forecast to generate 163 two-way people

movements in the AM peak (08:00 – 09:00) and 177 two-way total people movements in the PM peak (17:00 – 18:00). Of these movements, there are expected to be 101 and 140 two-way vehicle movements in the AM and PM peaks respectively.

- 9.10 There are a large proportion of trips forecast to be undertaken by sustainable modes, which is a reflection of the excellent accessibility of the site and its distance from local facilities including shops, restaurants, employment areas and public transport stops.
- 9.11 Junction modelling has been undertaken for the Ffordd y Mileniwm / Gladstone Bridge roundabout which continues to operate well within its theoretical operating capacity during each of the assessed scenarios.
- 9.12 The Ffordd Y Mileniwm / Hood Road / Neptune Road signalised junction has also been assessed. The modelling suggests that this junction is approaching its capacity in the future year for the PM peak period. Overall the development will have a minimal impact on the overall performance of the junction.

Conclusion

- 9.13 This TA demonstrates that the site is suitably located for the proposed development, observing the principles of national policies, and ultimately can deliver the necessary growth in Barry and the VoG.
- 9.14 The site is accessible by a range of modes, which in future will improve with the development of the South Wales Metro and other associated infrastructure coming forward as a part of the Barry Waterfront Development.

Appendix A

Transport Assessment Scoping Note

Proposed Mixed Use Development - No.1 Dock, Barry Transport Assessment Scoping Note – September 2022

226956/N01 V2
12th September 2022

Overview

1. This note has been prepared by Vectos, Part of SLR, on behalf of ABP Dev Co to set out transport and highway matters associated with a proposed mixed use development including marina at the No.1 Dock Barry, Vale of Glamorgan, CF62 5BR.
2. The site is located to the south of Ffordd Y Mileniwm and east of Neptune Way and is situated at the western end of the No. 1 Dock. It comprises a peninsula that extends into the dock that is accessed from Neptune Road.
3. This note sets out a proposed scope for the Transport Assessment being submitted as part of the forthcoming planning application.

Development Details

4. The proposed development relates to a mixed use scheme comprising the following:
 - The creation of a 400-berth marina with floating pontoons.
 - A 520 sqm marina office building which will include facilities for visitors/ members and a restaurant.
 - A 2,694 sqm incubator workspace building comprising offices, smart innovation space, break-out space and a café.
 - Residential development comprising 45 no. three and four bedroom townhouses and 19 no. one and two bedroom apartments with a maximum height of 4 storeys.
 - Access road and car parking which includes facilities for pedestrians and cyclists.
 - Landscaping and public open space/park.
 - Engineering works to raise the existing ground level to a minimum of 9.00m AOD in order to mitigate against flood risk.

Existing Site

5. The site comprises circa 7.5 acres of reclaimed land which was constructed as part of the No. 1 Dock in the 19th century, based on 25m foundations. Part of the site has recently been occupied by the

Ocean Water sports Trust (OWT). Access is currently provided from Neptune Road which in turn connects with Ffordd Y Mileniwm and Hood Road via a signal controlled junction.

Site Accessibility & Connectivity

Walking & Cycling

6. The site is well positioned to provide attractive and convenient walking routes to a range of local destinations and to local public transport stops and interchanges. New development such as this should be designed to promote and encourage walking in line with the Active Travel Act Guidance 2021 Transport Hierarchy. The scheme aligns with 15 minute neighbourhood principles through the location of a range of facilities within a short walk of the site, supporting local living. Equally the site is located within a walking catchment of various public transport routes.
7. The site is within walking distance of a number of local facilities, accessed via a comprehensive network of good quality footways of reasonable width (2m – 3m). Walking routes in the area include signalised crossing points on Ffordd Y Mileniwm and the surrounding roads include street lighting.
8. An existing pedestrian crossing across Ffordd y Mileniwm provides onward access and connectivity to Hood Road and Broad Street where local services including shops, pubs and employment areas are located.
9. The signalised junction of Ffordd y Mileniwm / Neptune Road / Hood Road includes Advance Stop Lines (ASLs) for cyclists on all arms.

Bus

10. The nearest bus stops are located on Ffordd y Mileniwm within 250m to 350m of the site entrance. These stops provide access to a range of services including routes serving Barry town centre, Cardiff via Penarth and to Cardiff via Wenvoe. The stops are generally served by a minimum of a bus service every 30 minutes across the day.

Rail

11. The site is an approximate 13 minute walk from Barry Island railway station and an approximate 14 minute walk from Barry railway station. Barry station benefits from a new overbridge and lifts funded by the Department for Transport and Welsh Government through the Access for All programme. This provides step free access to all platforms.
12. All the local stations in the area are set to benefit from the wider delivery of the South Wales Metro scheme. As a part of this, Transport for Wales (TfW) services from Barry and Bridgend to destinations north of Cardiff Central are to be provided using new tri-mode trains (running on a mixture of overhead power, battery and diesel depending upon the section of the route) from December 2023. These new trains are already being tested across the network in preparation for entering service.

- 1.1 Barry Docks station, located an approximate 1.5km walking route from the site, is subject to interchange improvements being delivered through the Cardiff Capital Region Metro Plus scheme.
- 1.2 The improvements were approved by VoG Council in August 2022. They include the establishment of a bus and taxi interchange to the south of the station platforms and groundworks for an additional Park & Ride car park accessed from Dock View Road to the north.
- 1.3 Existing accessibility to the site by rail and bus is good and is subject to various improvements that will increase the attractiveness of these public transport routes.

Vehicle Access

13. Vehicle access to the site is provided from Neptune Road which routes in a north-south alignment to the immediate west of the site. The road is currently unadopted and is a part of the Persimmon development at Barry Waterfront. Upon completion of the wider Barry Waterfront development, Neptune Road is due to be adopted by VoG Council.
14. Neptune Road connects the site with Ffordd y Mileniwm, a main route through Barry. It is a two-way single carriageway residential estate road with footways and street lighting. The road is subject to a 30mph speed limit. There is a signalised crossing to the north at its junction with Ffordd y Mileniwm forming part of the signal controlled junction.

Personal Injury Collision Review

15. A review of Personal Injury Collision data will be undertaken covering Neptune Road, Ffordd Y Mileniwm and Hood Road.

Policy Context

16. The following national and local policy will be considered:
 - Planning Policy Wales 11 (February, 2021)
 - Future Wales – The National Plan 2040 (February 2021)
 - Active Travel (Wales) Act 2013 (October 2013)
 - Well-being of Future Generations (Wales) Act (April 2015)
 - South East Wales Strategic Development Plan
 - Vale of Glamorgan Local Development Plan 2011-2026
17. VoG is currently preparing its replacement Local Development Plan (LDP) 2021 – 2036. The current LDP (2011 – 2026) was adopted in June 2017. The site forms part of Policy SP2 – Strategic Site Barry Waterfront which includes the peninsula that extends into the No.1 Dock. The allocation relates to ongoing redevelopment to provide a residential led mixed use community. The development proposals align with the site allocation.

Development Operation

18. The emerging masterplan for the site is provided in **Appendix A**. Further details by land use are provided in turn.

Marina

19. The development includes the creation of a 400-berth marina with floating pontoons. The pontoons are located to the north, east and west of the peninsula with the pontoons fixed to the site at regular intervals.
20. A slipway is provided on the eastern end of the peninsula enabling boats to be launched and retrieved from the dock.

Restaurant

21. Linked to the marina operation, a 520 sqm office building is proposed which includes a restaurant.

Office Space

22. The site includes a 2,694 sqm incubator workspace building comprising offices, smart innovation space, break-out space and a café.

Residential

23. The residential element on the site comprises 45 no. three and four bedroom townhouses and 19 no. one and two bedroom apartments with a maximum height of 4 storeys.
24. The town houses are located in seven terraces across the site, fronting east, west and north.
25. On the western end of the site, a block of flats is proposed which provides 19 no. one and two bedroom apartments.

Access

26. Access to the site is provided via Neptune Road to the west. Neptune Road in turn connects to Ffordd y Mileniwm and Hood Road at a signalised junction. This access forms the primary access route into and out of the site.

Pedestrians

27. Pedestrian access is provided at two locations as follows:
 - Adjacent to the carriageway of Neptune Road
 - At the south western corner of the site connecting through to the Barry Waterfront development.

Cyclists

28. Access for cyclists is provided via the main access route into and out of the site. This access route will be signed at a maximum of 20 mph.

Cycle Parking

29. Cycle parking details are contained within the VoG Parking Standards by land use type. These Parking Standards include both car and cycle parking. The Parking Standards Supplementary Planning Guidance (SPG) forms part of the VoG Local Development Plan (2011 – 2026) January 2019.
30. The relevant cycle parking standards and the proposed provision at this stage is provided in **Table 1**.

Table 1 – VoG Selective Cycle Parking Standards (January 2019)

Land Use	Standards	Cycle Parking Provision
Residential Houses & Apartments	Apartments Long Stay – 1 stand per 5 bedrooms Short Stay – no requirement.	4 – 8 spaces (depending on 1 & 2 bedroom mix)
Offices	Long Stay - 1 stand per 200 sqm Short Stay – 1 stand per 100 sqm	Long Stay – 13 spaces Short Stay – 27 spaces
Restaurants & Cafes (All types)	Long Stay - 1 stand per 10 staff Short Stay – no requirement	Expected 1 – 2 stands
Marinas (Leisure Clubs & Sports Clubs)	Long Stay - 1 stand per 10 staff 1 stand per 10 facility users	Expected 40 spaces

Details: Office provides 2,694 sqm

Parking

31. Parking is proposed as follows:
- **Marina and office** - car park located between the marina and office building and adjacent to the site access road.
 - **Residential** - in a parking court for the flats and adjacent to internal roads within the site.

32. The vehicle parking standards are provided by zone with the site falling into 'Zone B Urban' which is defined as follows:

'Zone B Urban - very much part of a substantial built up area with a number of basic local facilities within 400m walking distance. A range of bus routes offering up to 6 buses per hour; the range of destinations offering practical access to most but not all essential facilities. The curtilage of the site restricts, to an extent, what car parking can be provided. There are likely to be some restrictions on on-street parking and other available off-street parking is severely limited or non-existent'.

33. The parking standards set out are maximum parking standards and further context provided with the standards state that 'an appropriate level of car parking is integrated in a way which does not dominate the development'. The relevant parking standards and the proposed parking provision is provided in **Table 2**.

Table 2 – VoG Selective Parking Standards (January 2019)

Land Use	Standards	Parking Provision
Residential Houses & Apartments	<i>Zones A - E</i> Residents - 1 space per bedroom (maximum requirement 3 spaces) Visitors - 1 space per 5 units	Houses & flats: 64 Parking: 64 spaces (one space per unit) Visitor: 2 spaces
Offices (>1,000 sqm)	<i>Zones A – B</i> 1 space per 60 sqm	46 parking spaces (1 space per 45 sqm)
Restaurants	<i>Zones A – C</i> Operational: 1 commercial vehicle space Non Operational: 1 space per 3 non-resident staff & 1 space per 7 sqm of dining area	72 parking spaces
Marinas	<i>All Zones</i> Operational – 1 car and trailer space Non- operational - 1 space per berth	
Total		184 spaces

Details: Vale of Glamorgan Local Development Plan (2011 – 2026) Supplementary Planning Guidance (SPG) January 2019

34. The level of parking across the site is proposed at a rate of one space per dwelling for the residential element plus visitor parking at a rate of one space per 32 units.
35. For the offices element, 46 parking spaces are proposed at a rate of (1 space per 45 sqm).
36. For the restaurants and marina, a total of 72 parking spaces are proposed. This level of parking is lower than the maximum vehicle standards however the overall accessibility of the site by active travel modes and by public transport support the approach of lower parking levels being taken. The level of parking is also reflective of the constrained nature of the site and also to avoid the development being overly dominated by parking.

Disabled Parking

37. Disabled parking is proposed in line with standard with 5% of the total car park capacity designated (to include both employees and visitors).
38. For the marina and restaurant elements, 6% of the total car park capacity is proposed for visiting disabled motorists. The standards also state that a minimum of one space for each employee who is a disabled motorist should be provided. Given the development is yet to be consented, it is not practicable to assume the level of disabled employees working at the site.

Electric Vehicle Charging

39. For new residential development proposals, VoG Council encourage developers to provide Electric Vehicle Charging Points (EVCP) wherever appropriate at a ratio of 10% of all parking spaces provided.
40. For non-residential a threshold approach is taken with land uses exceeding the thresholds set out in the SPG requiring each land use to provide active EVCPs to the Office for Low Emission Vehicles (OLEV) technical specifications of at least 10% of car parking spaces, which shall be a 'Fast' charge point type.
41. For reference, the relevant thresholds are provided as follows:
 - Leisure facilities including hotels - > 1,000sq.m gross floor area
 - Business - > 2,500sq.m gross floor area

Delivery and Servicing

42. The functionality of the masterplan is being tested through swept path analysis for the range of vehicles that are routinely expected to access the site as well as emergency vehicles. Swept path analysis is being undertaken for the following:
 - Refuse collection vehicle
 - Car and boat trailer

- Fire Tender and Aerial Ladder Platform
- Standard Design Vehicle (SDV) and 7.5t panel van (two way passing)

Trip Generation

43. The assessment of trip generation is to be undertaken using the industry standard TRICS database and relevant land uses.
44. The emerging development quantum will be used to assess trip generation for the Marina, Office accommodation and residential elements of the site.
45. The trip generation will take into consideration the location of the development and the propensity for local trips to be undertaken by active travel modes. It should also be recognised that Welsh Government have set a target of 30% WfH where it's possible to do so.
46. Similarly, a new school is being constructed almost opposite the site and given that circa 50% of trips in the AM peak period are related to education, we expect a proportion of education trips to be made on foot.

Distribution

47. Vehicle distribution will be undertaken through use of 2011 Census Journey to Work for the Middle Super Output Area (MSOA) covering the site; *Vale of Glamorgan 015 W02000251*.
48. The approach to distribution and assignment will be undertaken for the different land uses as follows:
 - **Marina and Offices** - 2011 Census Journey to Work inbound trips to the MSOA;
 - **Residential** – 2011 Census Journey to Work for residents living in the Vale of Glamorgan 015 W02000251 MSOA and working elsewhere.
49. Vehicle trips will be distributed through the signalised junction of Ffordd y Mileniwm / Neptune Road / Hood Road.

Traffic Survey

50. A traffic survey of the Ffordd y Mileniwm / Neptune Road / Hood Road junction is being undertaken. The survey will capture peak period movements with a classified turning count for 07:00 – 10:00 and 16:00 – 19:00 for a neutral weekday in September. The survey will include queue lengths recorded at 5 minute intervals.

Traffic Effect

51. The traffic effect of the development will be considered at the signalised junction of Ffordd y Mileniwm / Neptune Road / Hood Road.

Summary & Next Steps

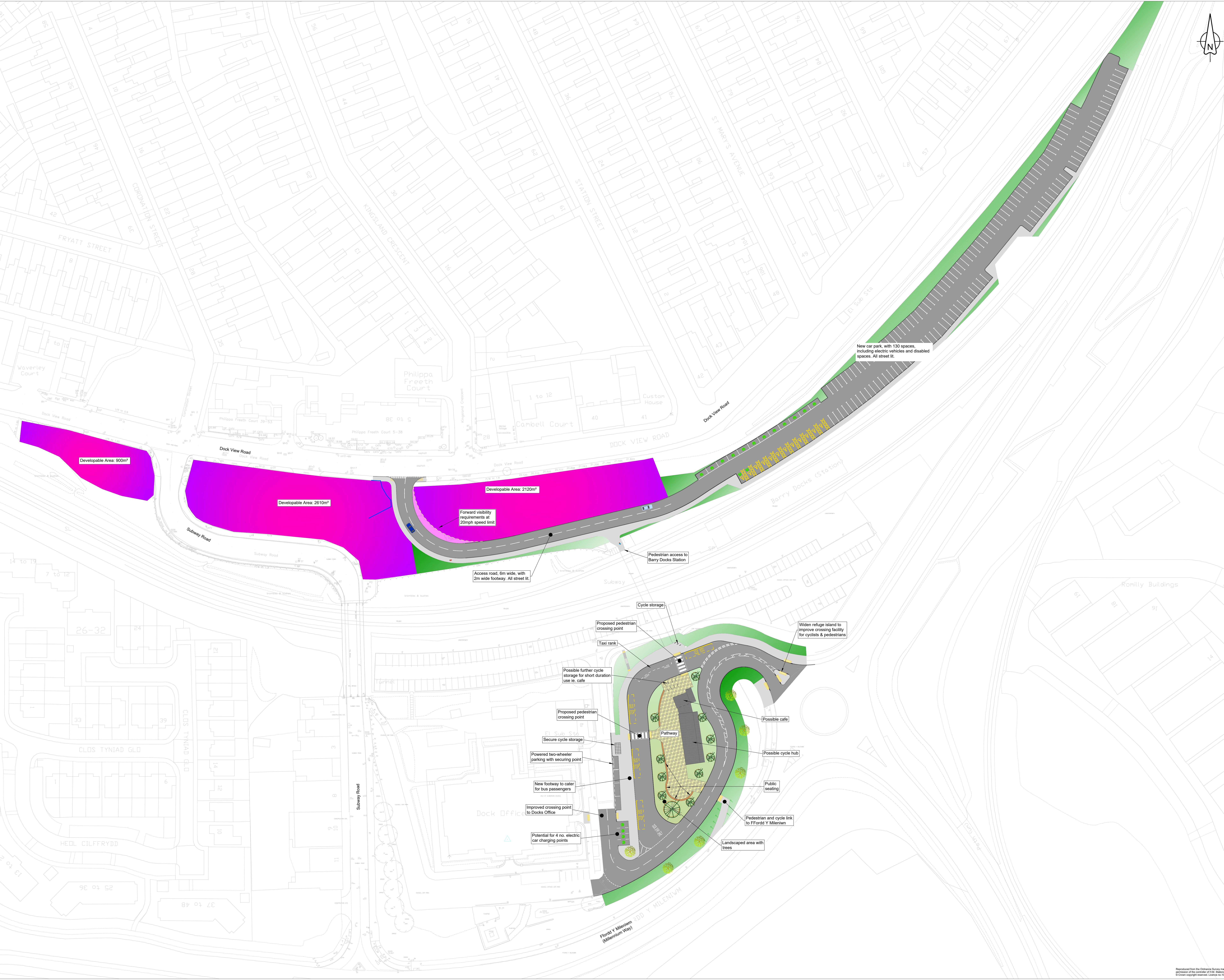
52. This note has been prepared by Vectos, Part of SLR, on behalf of ABP Dev Co to set out transport and highway matters associated with a proposed mixed use development including a marina at the No.1 Dock Barry, Vale of Glamorgan, CF62 5BR.
53. The site is located to the south of Ffordd Y Mileniwm and east of Neptune Way and is situated at the western end of the No. 1 Dock. It comprises a peninsula that extends into the dock.
54. This note has set out a proposed scope for the Transport Assessment being submitted as part of the planning application.
55. In addition, the application will be supported by a Travel Plan and a Delivery and Servicing Management Plan.

Appendix A

Emerging Site Masterplan

Appendix B

Barry Docks Station Interchange Layout



NOTES

1 Electric bus charging and bus shelters not shown for clarity

Rev	Revision details	Drawn	Chkd	Appd	Date
	Designed: AC/Turley				Date: 22/09/2021
	Drawn: AC/Turley				Date: 22/09/2021
	Checked:				Date:
	Approved:				Date:

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Client
VALE of GLAMORGAN
BHD MORGANUW

Project Name
Barry Docks Interchange

Drawing Title
Highway Alignment Option 2

Original Drawing Size : A1	Scale : 1:500
Dimensions : -	

Drawing Status SHARED	Suitability S3
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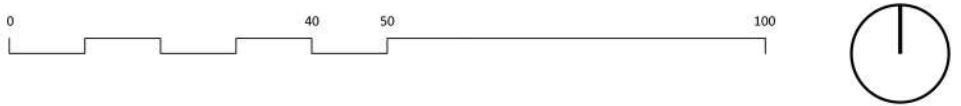
Drawing No BDI-AMEY-001-00-DR-C-005	Rev
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Appendix C

Site Masterplan



Schedule			
Type	Quantity	Type	Quantity
Flats (1 & 2 Bed)	20	Car Parking (Resi.)	65
Town House (3 & 4 Bed)	45	Car Parking (Resi. visitor)	13
		Car Parking (Marina)	130
Total		Total	208



Figured dimensions and levels to be used.
Any inaccuracies must be notified to the architect.
Detail drawings and large scale drawings take precedence over smaller drawings.

Rev:	
A	Additional parking and turning heads included. TW. 19.04.23
B	Edited landscaping and added traffic bollards to jetty. LJS. 10.05.23

Chk'd:	Rev:
DR	
DR	

Chk'd:	Rev:
-	

Chk'd:

PRELIMINARY	
PLANNING	✓
DESIGN	
TENDER	
CONSTRUCTION	

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Contract: **ABP**
Barry Waterfront 'The Mole' Masterplan
Title: **Illustrative masterplan - Ground Floor**

Drawing No.	Rev.
20065 (05) 100	B

Scale: 1:1000 @ A1
Date: 03 10 2022
Drawn: KP
Checked: AMS



Figured dimensions and levels to be used.
Any inaccuracies must be notified to the architect.
Detail drawings and large scale drawings take precedence over smaller drawings.

Rev:	Chk'd:	Rev:	Chk'd:	Rev:	Chk'd:
A	DR				
Edited landscaping and added traffic bollards to jetty. LJS. 10.05.23					

PRELIMINARY	
PLANNING	✓
DESIGN	
TENDER	
CONSTRUCTION	

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Contract: ABP
Barry Waterfront 'The Mole' Masterplan

Title: Illustrative masterplan - Podium Level

Drawing No. 20065 (05) 101
Rev. A

Scale: 1:1000 @ A1
Date: 03 10 2022
Drawn: KP
Checked: AMS