



Environmental Statement Chapter 15. Onshore Transport Assessment

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15.0 Onshore Transport Assessment

15.1 Introduction

- 15.1.0.1 This chapter provides an assessment of the potential impacts to and resulting from onshore traffic and transport arising out of the Project.
- 15.1.0.2 In order to assess these impacts this chapter describes the methodology used to conduct the assessment, baseline conditions for the Project and surrounding area, and mitigation measures required to prevent, reduce or offset any significant adverse effects identified during the assessment. It also presents the likely impact of the Project together with other schemes in the surrounding area - cumulative impacts.
- 15.1.0.3 This chapter describes the assessment of the impact of the Project on the surrounding highway network, public transport, cycling and pedestrian amenities. It is based on an assessment of the interaction between future development-related movements and existing patterns of vehicular, pedestrian and cycle movements.

15.2 Legislation, planning policy and guidance

15.2.1 Planning Policy Wales

- 15.2.1.1 The 2012 Planning Policy Wales (PPW) sets out the land use planning policies of the Welsh Government. It is supplemented by a series of Technical Advice Notes (TANs), circulars and policy clarification letters, and these documents together comprise national planning policy.
- 15.2.1.2 Chapter 8 of PPW sets out the Welsh Government's transport objectives. These are to extend choice in transport and secure accessibility in a way that supports sustainable development and helps to tackle the causes of climate change. This will be achieved by encouraging a more effective and efficient transport system, with greater use of the more sustainable and healthy forms of travel, and minimising the need to travel.
- 15.2.1.3 The Welsh Government supports a transport hierarchy in relation to new development that establishes priorities in such a way that, wherever possible, they are accessible in the first instance by walking and cycling, then by public transport and then finally by private motor vehicles.
- 15.2.1.4 Land use planning can help to achieve the Welsh Government's objectives for transport through:
- i. reducing the need to travel, especially by private car, by locating development where there is good access by public transport, walking and cycling;
 - ii. locating development near other related uses to encourage multi-purpose trips and reduce the length of journeys;
 - iii. improving accessibility by walking, cycling and public transport;
 - iv. ensuring that transport is accessible to all, taking into account the needs of disabled and other less mobile people;
 - v. promoting walking and cycling;

- vi. supporting the provision of high quality public transport;
- vii. supporting traffic management measures;
- viii. promoting sustainable transport options for freight and commerce;
- ix. supporting sustainable travel options in rural areas;
- x. supporting necessary infrastructure improvements; and
- xi. ensuring that, as far as possible, transport infrastructure does not contribute to land take, urban sprawl or neighbourhood severance.

15.2.1.5 TAN18: Transport (2008) describes how to integrate land use and transport planning and how transport impacts should be assessed and mitigated.

15.2.2 One Wales: Connecting the Nation - The Wales Transport Strategy

15.2.2.1 One Wales: Connecting the Nation (2008) is the Welsh Government's strategy for transport. The identified goal is to promote sustainable transport networks that safeguard the environment while strengthening the country's economic and social life. It sets out five key objectives:

- I. reducing greenhouse gas emissions and other environmental impacts;
- II. improving public transport and better integration between modes;
- III. improving links and access between key settlements and sites across Wales and strategically important all-Wales links;
- IV. enhancing international connectivity; and
- V. increasing safety and security.

15.2.3 Regional Transport Plan

15.2.3.1 The South West Wales Integrated Transport Consortium (SWWITCH) Regional Transport Plan (RTP) was adopted in 2009, and is the result of joint working between Carmarthenshire, Neath Port Talbot, Swansea and Pembrokeshire authorities. It is intended to shape transport policy in the region for the period 2010-2015 and beyond.

15.2.3.2 The RTP was based on the following key transport issues

- 1) road traffic volumes in the region, which have grown considerably resulting in unreliable journey times, increased congestion, reduced air quality, increased noise, vibration and carbon emissions;
- 2) road safety issues;
- 3) car ownership and use, which has increased rapidly; and
- 4) public transport provision.

15.2.3.3 The RTP sets out the following specific objectives for the region:

- I. to improve access for all to a wide range of services and facilities including employment and business, education and training, health care, tourism and leisure activities;
- II. to improve the sustainability of transport by improving the range and quality of, and awareness about, transport options, including those which improve health and well-being;
- III. to improve the efficiency and reliability of the movement of people and freight within and beyond South West Wales to support the regional economy;
- IV. to improve integration between policies, service provision and modes of transport in South West Wales;
- V. to implement measures which make a positive contribution to improving air quality and reducing the adverse impact of transport on health and climate change, including reducing carbon emissions;
- VI. to implement measures which help to reduce the negative impact of transport across the region on the natural and built environment including biodiversity; and
- VII. to improve road safety and personal security in South West Wales.

15.2.4 Local Planning Policy

15.2.4.1 The City and County of Swansea Council (CCSC) Unitary Development Plan (UDP) was adopted in November 2008. The UDP sets out a range of policies and proposals relating to future development, and outlines the use and conservation of land and buildings within the CCSC up to 2016. The UDP is stated to be based firmly on sustainable planning principles which are reflected in its spatial strategy and overall approach to the pattern, form and distribution of new development. The strategic policies of the UDP are to:

- 1) create a Quality Environment;
- 2) develop the economy;
- 3) provide homes and community facilities;
- 4) use resources efficiently; and
- 5) improve accessibility.

15.2.4.2 Chapter 5 of the UDP relates to Improving Accessibility, and includes the following policies:

15.2.4.3 *'Policy AS1- New development associated with housing, employment, shopping, leisure and service provision should be located in areas that are currently highly accessible by a range of transport modes, in particular public transport, walking and cycling, or in areas where a good level of such provision can realistically be achieved.'*

15.2.4.4 *'Policy AS2 - New developments should be designed to:*

- i. Promote the use of public transport and facilitate sustainable travel choices,*
- ii. Provide suitable facilities and an attractive environment for pedestrians, cyclists and other non-motorised modes of transport,*

- iii. *Allow for the safe, efficient and non intrusive movement of vehicles, and*
 - iv. *Comply with the principles of accessibility for all.*
- 15.2.4.5 *The means of access to new developments should be designed to ensure that:*
- I. *Vehicle speeds are minimised,*
 - II. *Extraneous traffic is not attracted, unless there is a specific strategic need for an access route through the area, and*
 - III. *Impacts on the natural, historic and built environment and local communities are minimised.'*
- 15.2.4.6 *'Policy AS5 – Development proposals will be required to consider the access requirements for pedestrians and cyclists and, where necessary, provide appropriate facilities and/or infrastructure to encourage their use.'*
- 15.2.4.7 *'Policy AS6 - Parking provision to serve development will be assessed against adopted maximum parking standards to ensure that proposed schemes provide appropriate levels of parking for private cars and service vehicles.*
- 15.2.4.8 *Account will also need to be taken of the need to provide facilities for the parking of motorcycles and cycles.'*
- 15.2.4.9 *'Policy AS10 - New developments will be required to incorporate appropriate traffic management measures to mitigate against significant adverse impacts that would otherwise be caused by traffic movements.'*
- 15.2.4.10 The Neath Port Talbot County Borough Council (NPTCBC) Unitary Development Plan was adopted in March 2008. The purpose of the document is to guide development, conservation and the use of land within NPTCBC for the fifteen years up to mid 2016.
- 15.2.4.11 The following policies relate to transport:
- 15.2.4.12 *'Policy 12- Improvements to the transport system will concentrate on: -*
- 1) *improving accessibility and highway safety and reducing congestion, pollution and disturbance generated by traffic;*
 - 2) *encouraging travel by public transport, cycling and walking as alternatives to the car; and*
 - 3) *encouraging the movement of freight by rail and sea as alternatives to road.'*
- 15.2.4.13 *'Policy 13- The location and design of development should contribute to more sustainable communities through reducing dependency on the motor car and encouraging the use of public transport, cycling and walking.'*
- 15.2.4.14 *'Policy 14- Proposals will be resisted which would be likely to cause unacceptable adverse impact in terms of: -*
- i. *traffic generation and highway safety;*
 - ii. *poor accessibility by public transport, cycling and walking including people with disabilities; and*
 - iii. *preventing the use or re-use of docks, harbours, wharfs or routes of railway lines.'*

15.2.5 Fabian Way Corridor Transport Assessment

- 15.2.5.1 The Fabian Way Corridor, from the River Tawe to the M4, has numerous sites for future development including employment, residential and leisure uses. The area has been identified as a sub-regional focus for economic growth with several major regeneration schemes ongoing e.g. SA1, Coed Darcy and Swansea University Bay Campus (SUBC).
- 15.2.5.2 The Welsh Assembly Government (WAG) commissioned Arup to undertake a strategic assessment of the transportation options for the Fabian Way Corridor. The study commenced in November 2008 with the Main Report issued in January 2010. The overall aim of the study was to develop a transport strategy to support the regeneration of the corridor.
- 15.2.5.3 Client steering group meetings including officers from CCSC and NPTCBC, stakeholder consultation with workshops and a community Newsletter were included as part of the process.
- 15.2.5.4 The preferred transport strategy incorporates highway, rail, public transport, walking and cycling, canal, Intelligent Transport Systems, demand management and a Strategic Travel Plan. Proposed targets for mode splits and a provisional programme for implementation are also included. The Preferred Transport Strategy has been approved in principle by both CCSC and NPTCBC.
- 15.2.5.5 Planned measures for the delivery of the transport strategy from 2010 to 2029 include:
- I. Short Term- Bus-only bridge over River Tawe, segregated busway, transport hub at Swansea University site;
 - II. Short, Medium and Long Term - Walking and cycling route improvements, improvement to bus services, reduction of speed limits;
 - III. Medium Term - Capacity improvements at Tawe Bridges, improvement to Park & Ride, upgraded pedestrian/cycle bridge ; and
 - IV. Long Term - Additional Park & Ride north of Amazon, new grade separated junction at Baldwin's Bridge.
- 15.2.5.6 The capital investment for the proposed measures was estimated to be of the order of £40m.

15.3 Assessment methodology

- 15.3.0.1 This ES proceeds on the basis of the outline construction programme as discussed in Chapter 4, Section 4.5.2, which anticipates construction starting in 2015 and with the main construction lasting for about three years. The assessments contained in this chapter are not materially sensitive to works commencing within the anticipated validity of the DCO, which is five years, or to an extension of (say) a further year-or-so.

15.3.1 Sensitive receptors

- 15.3.1.1 The scale and extent of the assessment have been defined in accordance with the 1994 Institute of Environmental Management and Assessment (IEMA) guidelines.

15.3.1.2 The first phase of the assessment was the identification of sensitive receptors (i.e. locations that may be sensitive to changes in numbers of people or vehicle movements). The following sensitive receptors have been identified:

- i. pedestrian and cyclists on the roads and footways leading to the site;
- ii. motorised users on the local highway network; and
- iii. public transport facilities around the site.

15.3.1.3 The IEMA recommends a detailed assessment for highway links where:

- i. traffic flows will increase by more than 30% (or the number of heavy goods vehicles (HGVs) will increase by more than 30%); or
- ii. specific environmental problems may occur (sensitive areas affected by traffic increases of at least 10%, unless there are significant changes in the composition of traffic).

15.3.1.4 Based on these guidelines, the geographical extent of the assessment was initially identified as incorporating Fabian Way from the Tawe Bridges junction to the junction with Baldwin's Crescent. No comment relating to the extent of the assessment was received during the scoping consultation process. However, both CCSC and NPTCBC requested that the assessment should be extended to include all junctions on Fabian Way east to the A48/A483 junction after reviewing the PEIR, and this has accordingly been incorporated into this assessment.

15.3.2 Significance criteria

15.3.2.1 The significance criteria for assessing the traffic and transport effects of the Project are given in Table 15.1. These significance criteria have been based on the IEMA guidance and the Department for Transport document 'Guidance on Transport Assessment' (2007). However, for a number of effects there are no ready thresholds of significance. In these cases, the thresholds of significance have been assessed through interpretation and professional judgement, based on knowledge of the Project and study area and/or quantitative data, where available.

15.3.2.2 Impacts are assessed before and after mitigation, and are identified as either:

- I. adverse - meaning that they produce disbenefits in terms of transportation and access;
- II. negligible - meaning that there is no measurable effect; or
- III. beneficial - meaning that they produce benefits in terms of transportation and access.

15.3.2.3 Where adverse or beneficial impacts have been identified these have been assessed against the following scale:

- 1) minor - slight, very short or highly localised impact of no significant consequence;
- 2) moderate - limited impact (by extent, duration or magnitude) which may be considered significant; and
- 3) major - considerable impact (by extent, duration or magnitude) of more than local significance or in breach of recognised acceptability, legislation, policy or standards.

Table 15.1 Significance criteria for assessing traffic and transport impacts

Impact	Level of Significance			
	Negligible	Minor	Moderate	Major
Change in driver delay/journey time	Change of less than 30 seconds	Change of between 30 to 60 seconds	Change of between 1 and 3 minutes	Change of more than 3 minutes
Change in pedestrian and cyclist delay/journey time	Change of less than 30 seconds	Change of between 30 and 60 seconds	Change of between 1 and 3 minutes	Change of more than 3 minutes
Change in level of accessibility for pedestrians and cyclists	Change of less than 2 minutes in journey time	Change of between 2 and 5 minutes in journey time; Need to cross quiet road	Change of between 5 and 10 minutes in journey time; Need to cross busy road; Closure of one or more points of access to a location	Change of more than 10 minutes in journey time; Need to cross busy major road; Closure of all points of access to a location
Change in pedestrian and cyclist amenity	Change in road traffic or HGVs of less than 30%, or less than 10% if location considered sensitive	Change in road traffic or HGVs of 30-49%, subject to a minimum change of 300 vehicles or 30 HGVs per hour; Slight increase or decrease in width of footway/ cycleway	Change in road traffic or HGVs of 50-99%, subject to a minimum change of 600 vehicles or 60 HGVs per hour; large change in width of footway/ cycleway; Closure or opening up of short stretch (<100m long) of footway/ cycleway	Change in road traffic or HGVs of 100% or more, subject to a minimum change of 1,200 vehicles or 120 HGVs per hour; Closure or opening of long stretch (>100m long) of footway/ cycleway

15.3.2.4 Impacts that are 'moderate' or 'major' are regarded as being significant for the purpose of the EIA regulations and the Marine Works (Environmental Impact Assessment) Regulations.

15.4 Baseline conditions and study area

15.4.1 Highway network

15.4.1.1 Fabian Way is an arterial road which forms part of the A483, connecting Swansea city centre with the M4 motorway at Junction 42. It is the main route into Swansea from the surrounding area and for traffic from further afield, and forms the principal object of study within the study area. The section of Fabian Way under consideration is shown in Figure 15.1. It is approximately 7.6 km long and extends through the centre of Crymlyn Burrows and the unitary authorities of CCSC and NPTCBC. Fabian Way is a dual carriageway for its whole length in the study area. The speed limit is 30 mph between Swansea city centre and the junction with Port Tennant, after which the speed limit rises to 50 mph until the junction with Ffordd Amazon (Jersey Marine roundabout). The road is a standard, national speed limit, dual carriageway between Jersey Marine and the junction with the M4.

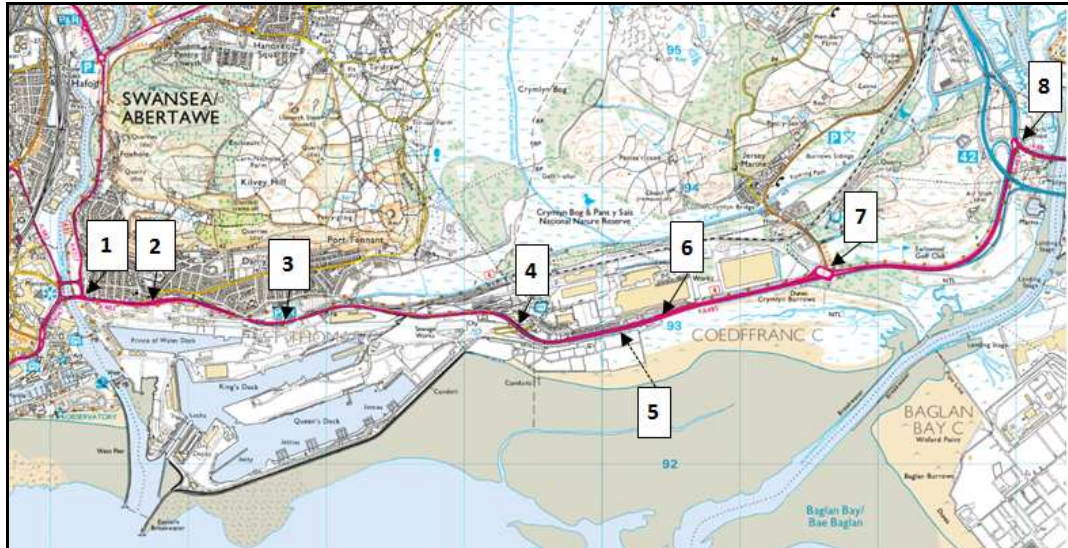


Figure 15.1 Study area

- 15.4.1.2 The junctions along Fabian Way and within the study reported here are described below. Reference should be made to Figure 15.1 above.
- 15.4.1.3 At its western end, Fabian Way connects with the A4067 Quay Parade, A483 East Bank Way and King's Road (Junction 1) via a four arm signal controlled junction. There are a number of restricted movements at the junction. East Bank Way to the north is one-way southbound, and there is no ahead movement from this approach. On Fabian Way, traffic can only travel ahead to Quay Parade. From King's Road vehicles can only turn left onto Quay Parade, and from Quay Parade vehicles can only travel ahead to Fabian Way. There are signal controlled pedestrian crossing facilities on Fabian Way and East Bank Way, and uncontrolled crossing facilities on King's Road.
- 15.4.1.4 The Port Tennant junction (Junction 2) is a four arm signalised junction providing access to the SA1 development to the south and residential areas to the north of Fabian Way. Further to the east, another four arm signalised junction (Junction 3) provides access to a Park and Ride facility to the north and the former main entrance to the Port of Swansea to the south. The junction with Baldwin's Crescent (Junction 4) is grade separated, providing access to the former oil terminals and Queen's Dock to the south and other industrial and retail premises to the north of Fabian Way. It is now the main entrance to the Port of Swansea.
- 15.4.1.5 As part of the proposals for the SUBC, a new signal controlled junction will be provided on Fabian Way (Junction 5). There will also be access to SUBC from a new arm at the existing signal controlled junction between Fabian Way and Elba Crescent (Junction 6).
- 15.4.1.6 The Jersey Marine junction between Fabian Way, Ffordd Amazon and B4290 (Junction 7) has been significantly modified and the work was completed in March 2008. It is now a four arm signalised roundabout, which incorporates a new arm serving the Amazon site to the north. The roundabout has been widened and there is a segregated left turn from Fabian Way to Ffordd Amazon that bypasses the traffic signals. The westbound carriageway of Fabian Way bypasses the roundabout to the south, providing free flow through the junction.

- 15.4.1.7 From Jersey Marine roundabout, the B4290 heads north providing links to Jersey Marine and Llandarcy en route to Neath, Skewen and Junction 43 of the M4.
- 15.4.1.8 The study area extends out to the signal controlled junction between the A48 and A483 (Junction 8) which connects with the north-facing sliproads of Junction 42 of the M4.
- 15.4.1.9 The Amazon access road has recently been extended to connect with Baldwin's Crescent (Junction 4). There is a bus gate at the western end of the new section of road, which will be a bus-only route serving the Coed Darcy development to the north. The connection between the Amazon access road and Coed Darcy (Southern Access Road) has not been constructed.

15.4.2 Public transport

- 15.4.2.1 Bus services operate regularly in the vicinity of the site, with 11 services operating along Fabian Way, Elba Crescent or Baldwin's Crescent. All of these services start from Swansea Bus Station and travel between Swansea and various towns and villages to the east. Service 7 runs between Swansea Bus Station and Swansea Marina.
- 15.4.2.2 The services are summarised in Table 15.2 below.

Table 15.2 Bus services

Service No.	Operator	Route	Frequency		
			M - F	Sa	Su
7	First	City centre - Swansea Marina	Hourly	Hourly	-
44	First	Swansea - SA1 - Grenfell Park	Hourly	Hourly	-
156	SBAC	Swansea – Neath	-	-	6 / day
157	First	Swansea - SA1 - Elba Cr – Neath	Hourly	Hourly	-
158 / X58	First	Swansea - SA1 - Elba Cr – Banwen	Hourly	Hourly	Hourly
224	First	Swansea - SA1 - Elba Cr – Porthcawl	Hourly	Hourly	-
X1	First	Swansea - Elba Cr - Neath - Port Talbot – Bridgend	2 / hour	2 / hour	-
X3	First	Swansea - Elba Cr - Port Talbot – Maesteg	Hourly	Hourly	-
X5	First	Swansea - Neath – Glynneath	2 / hour	2 / hour	-
X6	SBAC	Swansea – Neath	Hourly	-	-
X63 / X64	First	Swansea - SA1 - Neath – Ystradgynlais	Hourly	Hourly	-
X75	FC5	Swansea - Neath - Glynneath - Hirwaun - Merthyr Tydfil	4 / day	6 / day	-

- 15.4.2.3 The nearest bus stops to the site are illustrated in Figure 15.2 below. The site can be accessed from bus stops at two locations. The first is on Fabian Way close to Junction 3 (Figure 15.1), near the junction with Wern Terrace. These stops are approximately 3.7km from the western landfall, via Bevans Row and the new Lagoon access road. There is a

pedestrian overbridge crossing Fabian Way providing access to the eastbound stop. The second location is near the SUBC, to the east of Junction 4. The bus stop near the SUBC is approximately 950m from the perimeter cycle and footpath that will run around the Project, approximately 3.3km from the western landfall, and is presently accessed from Fabian Way via Baldwin's Bridge.

- 15.4.2.4 An average walking speed of approximately 1.4 m/s is generally assumed for pedestrians. This equates to approximately three miles per hour. The western landfall is therefore a 44 minute walk from the bus stops close to Junction 3. From the bus stops near the SUBC site it is an 11 minute walk to the perimeter cycle and footpath, and a 39 minute walk to the western landfall.

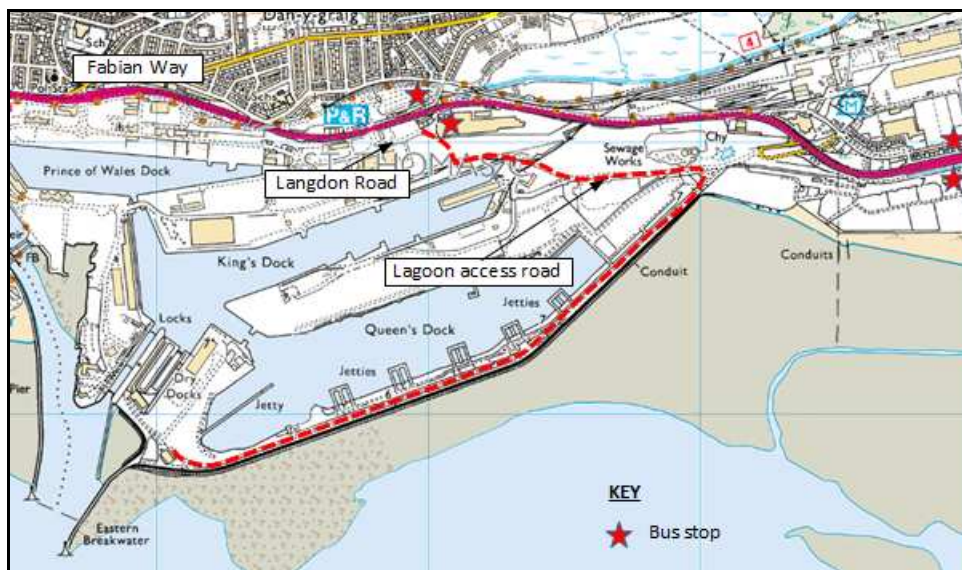


Figure 15.2 Bus stop locations

- 15.4.2.5 A Park & Ride facility is located just to the north of Fabian Way at Junction 3, at the same location as the first bus stop identified above. Service 502, operated by First, runs every 12-15 minutes between 07:00-19:07 on Monday to Saturday between the Park & Ride site and the city centre. The Park & Ride site has 550 parking spaces, including 23 disabled bays, and is open from 06:45-19:30.

15.4.3 Pedestrians and cyclists

- 15.4.3.1 There is a cycle path running along the southern side of Fabian Way between Kings Road (Junction 1) and the junction with Port Tennant (Junction 2), which forms a section of both National Cycle Network route 4 (NCN 4) and the Swansea to Glyncorrwg Loop. NCN 4 provides links between Swansea, Neath, Briton Ferry, Port Talbot and several local villages.
- 15.4.3.2 To the east of the Port Tennant junction the cycle path continues running adjacent to the southern side of Fabian Way and then crosses to the north via the pedestrian/cycle and bus bridge linking to the Park and Ride facility. The cycle path runs to the north of the Park & Ride site to Wern Terrace. It is then signed along a short section on Wern Terrace to the north side of Fabian Way, where it continues east to Baldwin's Crescent.

- 15.4.3.3 NCN 4 is signed along Baldwin's Crescent and Elba Crescent until re-joining the north side of Fabian Way. It continues east to the Jersey Marine roundabout (Junction 7) where it turns north to join Ffordd Amazon.
- 15.4.3.4 To the east of the Baldwin's Bridge junction, the footpath on the south side of Fabian Way is wide and is also used as a cycle path. The path narrows as it approaches the westbound offslip at the junction, where there is an uncontrolled crossing point. This wider section is the subject of a cycle link project being promoted by NPTCBC which extends cycle provision off Fabian Way and on to the road that provides access to the Port at Junction 4.
- 15.4.3.5 From the Tawe Bridges junction, the cycle path runs south alongside King's Road towards Prince of Wales Dock, where it then crosses the river via a pedestrian/cycle bridge using the Wales Coastal Path route over the Trafalgar Bridge and National Route 4 over the Sail Bridge, and on towards South Dock in the Maritime Quarter and Swansea town centre.
- 15.4.3.6 The wider road network of the SA1 development is subject to a Section 38 Agreement. However, the port internal road network is not presently adopted in the main. The SA1 road network (Langdon Road) extends to meet the proposed Project area and the Lagoon access road and associated pedestrian and cycle route improvements proposed as part of the Project.

15.4.4 Rail

- 15.4.4.1 The existing rail sidings to the north of Fabian Way are still in use. Where the rail passes underneath Fabian Way it changes possession from Network Rail to ABP. The railway through the docks has not been in use for approximately eight years and would require refurbishment to be in a serviceable state. The railway lines within the docks also have some tight corners which may need upgrading to be usable by more modern rolling stock.
- 15.4.4.2 The feasibility of using the rail sidings for import of construction materials has been considered and upgrade works would be required. For the purpose of the worst case assessment in this ES it has been assumed that those construction materials required which will not be transported by or sourced from the sea (eg sediment/gravel from seabed or rock armour and quarry run from Dean quarry) will reach the Project by road.

15.4.5 Baseline traffic data

- 15.4.5.1 Information gathered during site visits has been used to establish baseline conditions in terms of the highway network, accessibility and public transport facilities. This data has been supplemented by information obtained from maps and documents published by various authorities, including NPTCBC and CCSC.
- 15.4.5.2 Baseline information on existing road traffic movements has been obtained from CCSC, and is based on turning count surveys and Automatic Traffic Counts (ATCs) undertaken in June 2010 and May 2012. Copies of the data are presented in Appendix 15.1. Additional traffic counts were requested by CCSC and NPTCBC during a consultation meeting held on 9 October 2013. The purpose of the additional counts was to establish traffic flows at weekends, in order to assess the impact of traffic related to major sporting events that could be held at the Project. These additional counts were carried out in November 2013. Copies of the traffic count data are presented in Appendix 15.2 with supporting figures illustrating the locations of the surveys. It should be noted that in July 2013, ABP

altered the location of their main port access from Junction 3 to Junction 4. The surveys undertaken in October 2013 represent conditions after the switch.

- 15.4.5.3 ATC data was obtained from CCSC for a site located on Fabian Way, close to the Baldwin's Bridge junction. Data for Monday to Friday is from a count undertaken in May 2012, and data for Saturday and Sunday is from a count undertaken in May 2013. Eastbound, westbound and two-way flow profiles are presented in Table 15.3 below. Peak hour flows are shown in bold type.

Table 15.3 Baseline traffic flows – Fabian Way ATC

Time Period	Westbound			Eastbound			Two-way		
	M-F	Sat	Sun	M-F	Sat	Sun	M-F	Sat	Sun
00:00-01:00	49	97	159	62	110	169	111	207	328
01:00-02:00	35	67	114	33	94	130	68	161	244
02:00-03:00	32	64	80	24	79	114	57	143	194
03:00-04:00	23	44	40	19	57	73	43	101	113
04:00-05:00	65	79	48	33	130	81	98	209	129
05:00-06:00	234	164	110	81	278	170	315	442	280
06:00-07:00	444	318	154	248	292	174	692	610	328
07:00-08:00	1,055	604	261	510	437	294	1,564	1,040	555
08:00-09:00	1,477	750	430	791	607	436	2,268	1,357	866
09:00-10:00	1,256	1,023	658	887	729	574	2,144	1,752	1,232
10:00-11:00	1,148	1,128	789	1,007	853	607	2,155	1,981	1,396
11:00-12:00	1,214	1,207	873	1,150	991	819	2,365	2,198	1,692
12:00-13:00	1,182	1,136	799	1,238	970	1,042	2,420	2,106	1,841
13:00-14:00	1,176	1,060	757	1,281	1,065	888	2,457	2,125	1,645
14:00-15:00	1,135	811	595	1,336	1,107	987	2,470	1,918	1,582
15:00-16:00	1,175	693	594	1,312	1,144	1,001	2,486	1,837	1,595
16:00-17:00	1,105	751	667	1,508	1,099	718	2,612	1,850	1,385
17:00-18:00	972	736	618	1,400	741	560	2,371	1,477	1,178
18:00-19:00	825	602	457	1,066	485	464	1,891	1,087	921
19:00-20:00	617	456	350	753	356	312	1,369	812	662
20:00-21:00	446	283	266	552	359	230	998	642	496
21:00-22:00	359	280	227	405	439	181	764	719	408
22:00-23:00	200	221	143	272	311	114	472	532	257
23:00-24:00	107	182	97	129	221	72	236	403	169
TOTAL	16,333	12,756	9,286	16,096	12,954	10,210	34,428	25,710	19,496

- 15.4.5.4 On weekdays, the peak westbound flow (inbound to Swansea) is 1,477 veh/hr and occurs between 08:00-09:00. The peak eastbound flow, heading out of Swansea towards the M4, is 1,508 veh/hr and occurs between 16:00-17:00. When eastbound and westbound flows are combined, the busiest period is 16:00-17:00 with a two-way flow of 2,612 veh/hr.

- 15.4.5.5 Daily traffic flows on Saturdays are approximately 25% lower than on weekdays, and Sunday flows are approximately 43% lower. On Saturdays, inbound traffic peaks between 11:00-12:00 and outbound traffic peaks between 15:00-16:00. The maximum two-way flow of 2,198 veh/hr occurs between 11:00-12:00.
- 15.4.5.6 The daily westbound, eastbound and two-way traffic flows are presented in Figures 15.3-15.5 below.

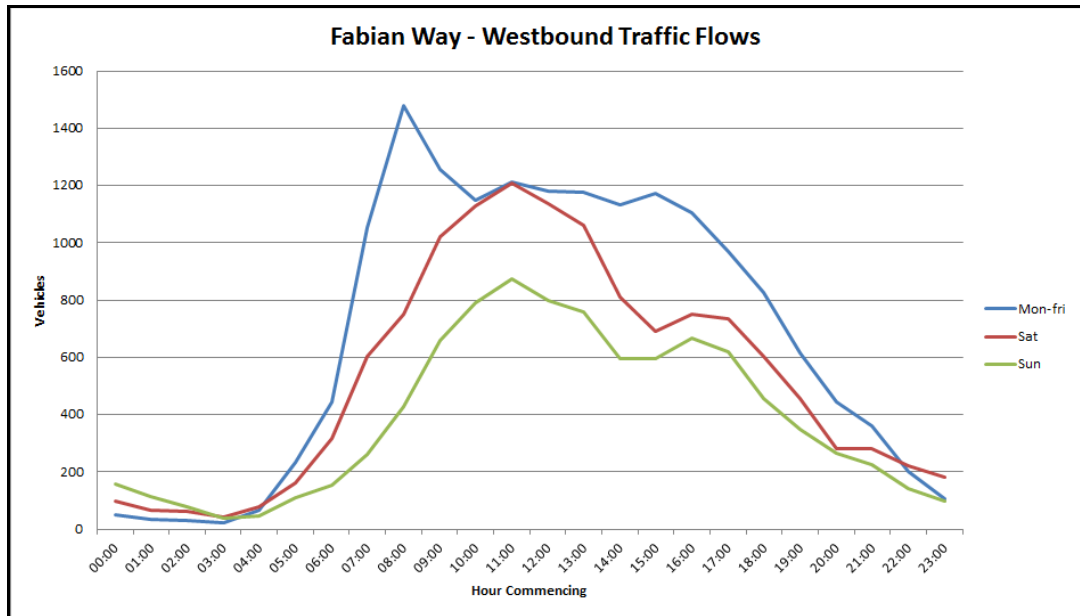


Figure 15.3 Baseline traffic flows - westbound

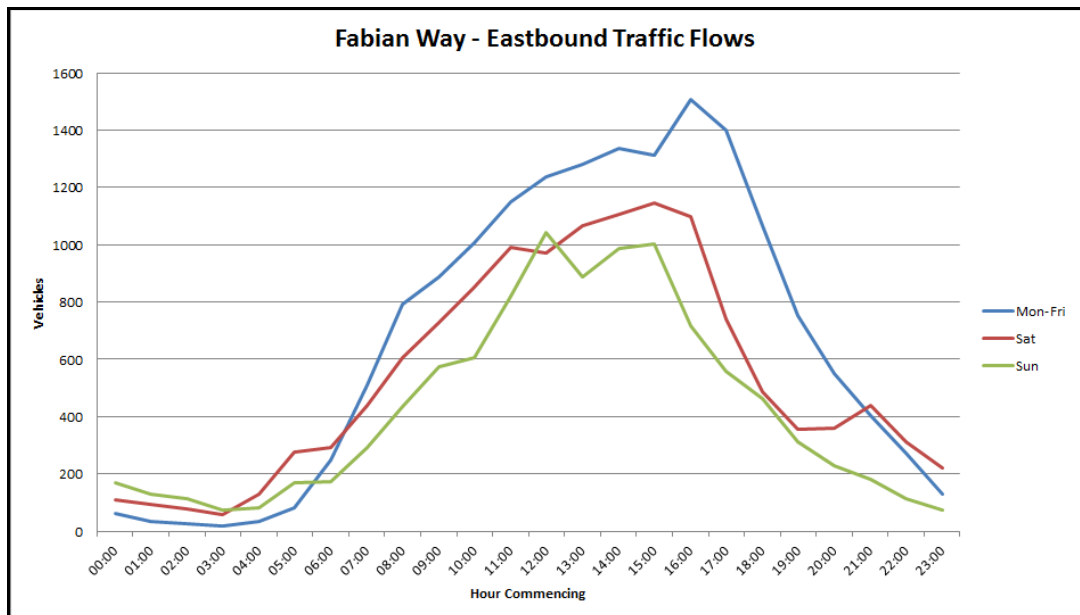


Figure 15.4 Baseline traffic flows – eastbound

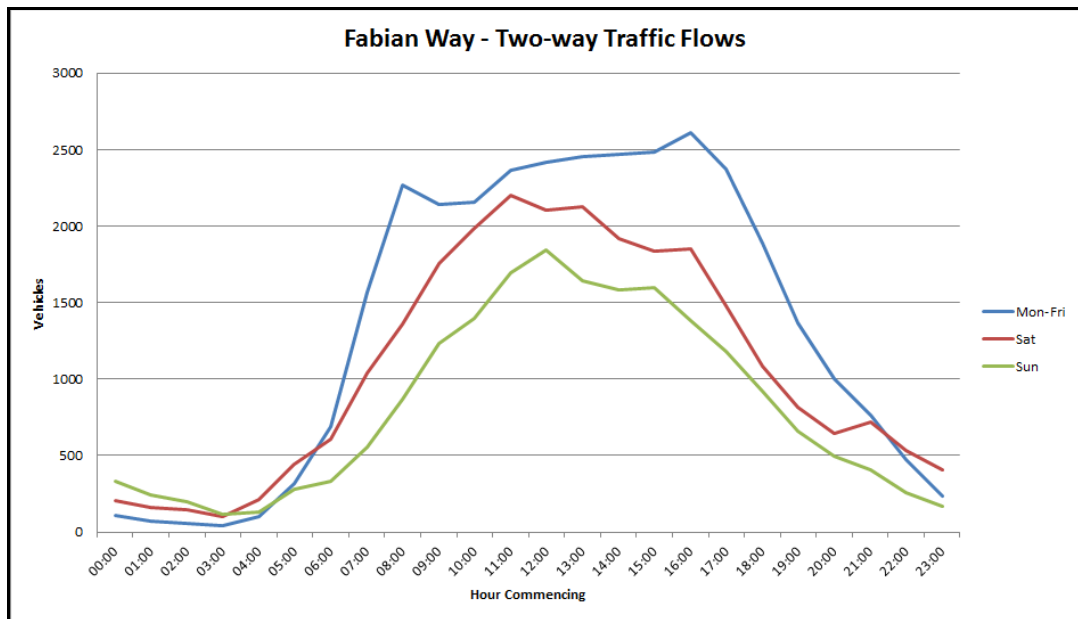


Figure 15.5 Baseline traffic flows – two-way

- 15.4.5.7 Weekday peak hour and daily two-way flows recorded during the junction counts on the local network are presented in Table 15.5 below. In order to factor the traffic flows obtained from the 2010 surveys up to 2013 flows, TEMPRO v.6.2 growth factors have been used, adjusted for local growth using NTEM traffic growth calculations. Growth rates for principal urban roads in the CCSC authority area have been used. The growth rates are presented in Table 15.4 below.

Table 15.4 Traffic growth rates

Period	AM Peak	PM Peak	Daily
2010 - 2013	1.0105	1.0133	1.0166

- 15.4.5.8 These growth factors have been applied to the flows obtained from the 2010 traffic counts (at the Fabian Way/P&R Access/Langdon Road and Fabian Way/Baldwin's Crescent junctions) to obtain baseline traffic flows for 2013, as shown in Table 15.5 below.

Table 15.5 2013 Baseline traffic flows

Location	08:00-09:00 All vehicles	17:00-18:00 All vehicles	Daily	
			All vehicles	% HGV
Quay Parade	4,094	4,704	46,255	2.3%
East Bank Way	1,746	1,809	21,041	2.8%
King's Road	629	634	4,675	1.1%
Fabian Way – east of East Bank Way	3,125	3,799	36,643	2.8%
Fabian Way – west of Port Tennant junction	3,174	3,027	33,610	3.2%
Fabian Way – east of Port Tennant junction	3,073	3,078	32,255	3.4%
Fabian Way - west of P&R junction	2,945	2,987	32,383	3.2%
Langdon Road	500	327	9,157	11.0%
Fabian Way - east of P&R junction	3,034	3,083	33,335	4.1%
Fabian Way - west of Baldwin's Crescent	3,290	3,189	32,289	4.6%
Fabian Way - east of Baldwin's Crescent	3,352	3,193	32,386	5.2%
Fabian Way – west of Elba Crescent	3,408	3,137	32,255	4.2%
Fabian Way – east of Elba Crescent	3,456	3,143	32,523	4.2%
Fabian Way – west of Ffordd Amazon	3,434	3,126	32,328	6.3%
Ffordd Amazon	95	113	1,028	26.0%
B4290	475	457	4,604	4.2%
Fabian Way – west of Fford Amazon	3,180	2,916	30,044	5.2%
A483 – west of A48 junction	1,596	1,424	14,908	6.8%
A48 – north of A483 junction	2,736	2,646	26,550	5.5%
A48 – south of A483 junction	2,712	2,604	26,194	4.4%

15.5 Assessment of impacts

15.5.1 Introduction

15.5.1.1 As discussed in Chapter 4: Project Description, the Project is intended to be of both functional and recreational benefit to the local and wider community and therefore public use of the Project. The principal purpose and function of the Project is as an electricity generating station. Two buildings are proposed which will be used by visitors: the Offshore Building which will comprise a visitor centre and O&M facilities and will be accessed along the western seawall; and the Western Landfall Building which will comprise a visitor orientation point, boating facilities, O&M facilities and a laboratory hatchery. In addition, extensive facilities for recreation are planned including a perimeter cycle and footpath around the Lagoon.

15.5.1.2 The Project is expected to employ approximately 72 staff during its operational phase, comprising 21 O&M staff and 51 staff at the Visitor Centre. Key O&M staff will work a rota ensuring coverage at all times to support the operation and security of the Project. Visitor and staff car and cycle parking is included within the Project area. The Project also makes provision for a shuttle bus service from the Park & Ride facility on Fabian

Way, subject to investigation of its viability. Further details can be found in Chapter 4: Project Description.

- 15.5.1.3 In terms of visitor numbers, it is anticipated that the Project will attract some 70,000-100,000 visitors a year (see Chapter 22, Tourism and Recreation), with national triathlon, swimming, sailing or running events occurring once or twice a year. These would be likely to attract between 2,000 and 8,000 visitors each.
- 15.5.1.4 In order to construct and operate the Project, different types of access will be needed at different times, namely:
- i. construction phase - for staff, HGV deliveries and abnormal loads (if required); and
 - ii. operational phase - access at all times for O&M staff and emergency vehicles; local pedestrian, cycle and vehicular visitor access; visitor access from the wider area; and visitor access for major sporting events.
- 15.5.1.5 Vehicle access for both the construction and operational phases will be via the Fabian Way/Langdon Road/Park & Ride junction (Junction 3). At the roundabout to the south of this junction, traffic will turn east along Langdon Road. From the eastern end of Langdon Road, a new road to link to the south side of the Port and Queens Dock will be provided, as well as a new coastal access road extending to the western landfall of the Lagoon. This is shown in Figure 15.6. From Langdon Road, the route will turn south and then east, running parallel to and immediately north of the existing port access road, before running to the boundary of the existing waste water treatment works (WWTW). From here, the existing Port road will be moved south and the Lagoon access road will continue past the entrance to the WWTW. Approximately 50m east of the entrance to the WWTW, the Lagoon access road will turn south, cross the Port access road by a priority junction, and extend west along the south of Queen's Dock. A new port security entrance will be created, and the existing security gate house will be relocated to the west of the Lagoon access road. Access to the Port will continue to be from Baldwin's Bridge junction.

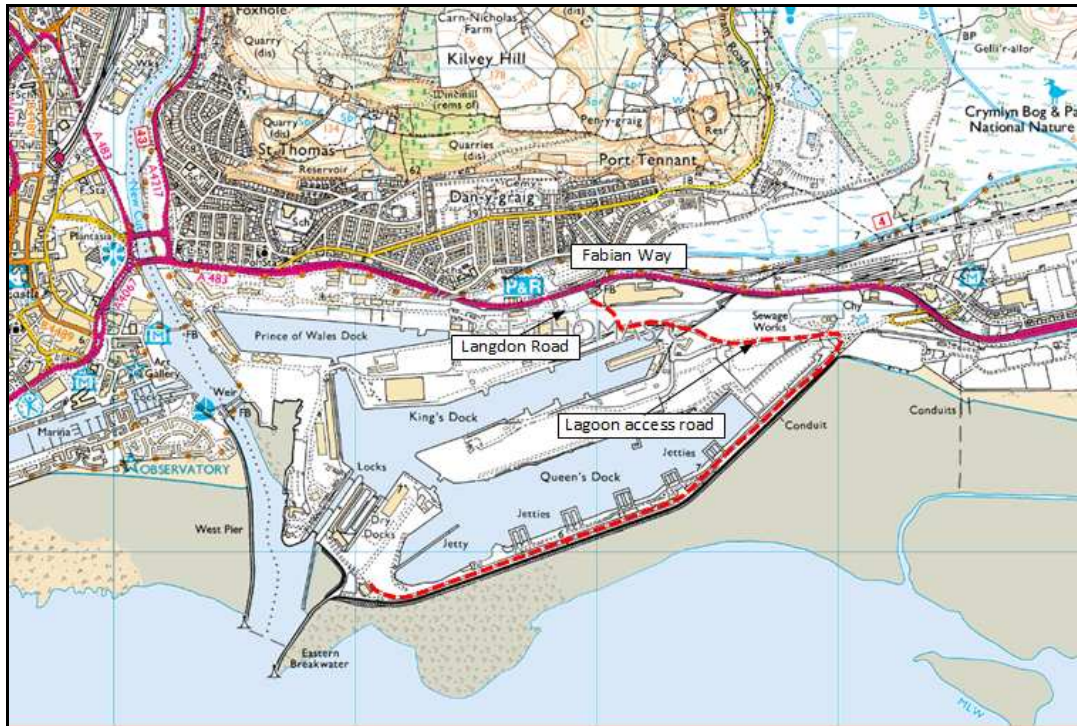


Figure 15.6 Vehicle access

- 15.5.1.6 Once the Lagoon access road has crossed the Port road, there will be a drop off point and turning area. This will allow pedestrians and cyclists to join the footpath and cycleway to the eastern landfall. The Lagoon access road will extend along the south side of Queen's Dock and utilise the alignment of the existing Port road. A new road will be constructed immediately to the north of the Lagoon access road, which will be separated by a secure fence and swale. In this way, existing movement through the Port will not be significantly affected by the Project. Additional information on the Lagoon access road can be found in Chapter 4, Section 4.3.7.
- 15.5.1.7 The Lagoon access road will also include facilities for pedestrians and cyclists along its entire length in the form of a Shared Use Path (SUP). In order to be convenient, attractive and safe to potential users, the proposed SUP will be between 3m wide, flat and, for the vast majority of its route (with some wider sections along the sea front), segregated from the vehicular carriageway by a 1m wide grass separation strip. A new footpath/cycleway will be created south of Langdon Road to link the existing footpath from SA1 to the start of the Lagoon access road. A small section of the SUP along Langdon Road will not be segregated due to unavoidable land constraints.
- 15.5.1.8 At its southern end, the SUP will link with the circular SUP which will run atop the Lagoon seawall. The SUP will also link with a separate SUP to the east, providing a continuous link for pedestrians and cyclists between the Project's visitor centre and the SUBC. The proposed SUP supports a Sustrans aspiration to consider improvements to the National Cycle Network route 4 away from Fabian Way.
- 15.5.1.9 Under the current Project design, the WWTW, which is currently accessed via Baldwin's Crescent and the main entrance to the Port, would be accessed via Langdon Road and the Lagoon access road.
- 15.5.1.10 The junction arrangement at the crossing of the Lagoon access road and the existing Port road will be designed to prevent traffic on the Lagoon access road from accessing Fabian

Way at Baldwin's Bridge, and also to prevent traffic from accessing the Lagoon or Langdon Road via Baldwin's Bridge and the Port road. Signage will be employed at the entrance to the Lagoon access road/Fabian Way Junction 3 to ensure that extraneous traffic is not attracted. Exceptional loads arising during construction will access the Project area via Junction 4 if necessary.

- 15.5.1.11 The Lagoon access road design seeks to ensure that vehicle speeds are minimised by limiting the road width to 5.5m. Speed along the Lagoon access road will also be regulated through the use of speed signs.
- 15.5.1.12 A temporary construction route will be provided from the new Lagoon access road to the site compound utilising existing carriageway where possible. An emergency vehicle access will also be provided from the new Lagoon access road to the eastern landfall.
- 15.5.1.13 A shuttle bus between the existing Park & Ride facility on Fabian Way and the western landfall is proposed, subject to investigation of its viability. It is envisaged that the operating hours and frequency of the service will be tailored to match demand from visitors and be agreed with CCSC.
- 15.5.1.14 A jetty will be provided on the western bank of the River Tawe on the lagoon wall to facilitate a water shuttle serving the Project from the west bank of the River Tawe and/or Mumbles (further details can be found in Chapter 4).
- 15.5.1.15 Car parking provision at the western landfall building will be as follows:
 - i. 304 spaces for visitors, including 33 disabled bays; and
 - ii. 28 spaces for staff, including 5 disabled bays
- 15.5.1.16 Since access to the Offshore Building incorporating the visitor centre will be on foot or by a shuttle bus provided by TLSB, car parking provision at the Offshore Building will be as follows:
 - I. 27 spaces for staff, including 3 disabled bays.
- 15.5.1.17 Cycle parking for staff has been based on provision of one space per 10 employees, in line with CCSC parking standards. There is expected to be a total of 73 staff (including Visitor Centre staff and O&M staff), and therefore 8 staff cycle parking spaces will be provided. For visitors, 100 cycle parking spaces will be provided. Cycle parking will be distributed across the site as follows:
 - 1) Offshore building - 12 spaces;
 - 2) Western arm - 30 spaces;
 - 3) Western landfall - 56 spaces; and
 - 4) Eastern landfall - 10 spaces.

15.5.2 Assessment of impacts during construction

- 15.5.2.1 Much of the construction phase transport movement will be marine-based, including delivery of rock and the construction of the Geotubes®, which will use locally derived sediment from the seabed or a combination of dredge gravels and imported quarry run. This will limit construction phase impacts on the local road network.

- 15.5.2.2 Working hours during the construction phase have not yet been finalised. However, it is likely that there will be continuous working during some phases of construction. In terms of impact on the local highway network, the key busiest periods are the AM and PM commuter peaks, typically 08:00-09:00 and 17:00-18:00. When work is carried out in shifts, the start and finish times generally do not coincide with the regular commuter peaks. To ensure that the assessment of the impact of construction traffic is conservative it has been assumed that construction staff will operate typical daytime hours.
- 15.5.2.3 Working hours for construction projects are typically 08:00-18:00 on weekdays and 08:00-13:00 on Saturdays. However, for safety reasons, it is expected that staff will not be permitted to drive their own vehicles close to the Lagoon seawall. Instead, transport will be provided between the site compound and the work area. Therefore, it is expected that construction staff will be required to arrive at the site compound by 07:30 in the morning, which will allow 30 minutes for transport within the site. These details will be incorporated in the Construction Phase Traffic Management Plan, a draft of which has been issued during consultation to CCSC and NPTCBC.
- 15.5.2.4 The temporary employment created by the Project in the construction phase has been estimated by Cardiff Business School (Appendix 22.1) and is discussed in Chapter 22 (Table 22.11). Annually, it is predicted that there will be 1,150 construction personnel. For the purpose of this assessment it is assumed that during the peak construction period the maximum number of employees on site is 600, comprising 200 contractor's staff and 400 sub-contractors. In order to estimate the number of staff cars and vans travelling to site the following assumptions regarding vehicle occupancy have been made:
- Contractor's staff 1 person/car = 200 vehicles
 Sub-contractors 2 people/car = 200 vehicles
 Total = 400 vehicles
- 15.5.2.5 For distribution of the construction staff traffic onto the local highway network, reference has been made to the employment distributions assumed in transport assessments prepared for SUBC (which has employment use as well as educational use) and the Ffordd Amazon Gateway Development. Adjustments have been made to take into consideration the likelihood that construction staff on short-term contracts will be prepared to travel further than staff employed on a permanent basis. The distribution assumed is shown in Table 15.6 below.

Table 15.6 Construction staff traffic distribution

Origin	Proportion
Swansea	25%
M4 (east)	25%
M4 (west)	20%
A48 (to Neath/Port Talbot)	10%
B4290 / A465 (via M4 J43)	20%
TOTAL	100%

- 15.5.2.6 Based on these assumptions, 75% of staff (equating to 300 vehicles) would originate from the east, and would therefore travel west along Fabian Way into Swansea in the morning. It has been assumed that one third of these (or 100 vehicles) would arrive between 06:30-07:00, and two thirds (or 200 vehicles) would arrive between 07:00-07:30. In the evening the 300 vehicles would travel in the opposite direction between 18:00-19:00.
- 15.5.2.7 An additional allowance of 10% of the peak traffic, or 80 two-way trips, has been made for inter-peak traffic, which has been assumed to be evenly spread throughout the day.
- 15.5.2.8 It is anticipated that the main bulk material for the construction of the Lagoon seawall will be imported by sea as far as possible. The use of a concrete batching plant within the Port has also been proposed. However, some raw materials for concrete production, steel reinforcement, turbine components and other elements of the Project will have to be imported by road.
- 15.5.2.9 A preliminary assessment of the number of HGV movements required during the construction phase is shown in Table 4.6 of Chapter 4, Project Description. It has been assumed that sand required for concrete production will be obtained via Swansea Port, and that concrete will be produced at an on-site batching plant, which means that these activities will not generate any HGV movements on the external road network. Based on these assumptions the maximum number of HGV deliveries using the local road network is expected to be 1,975/month.
- 15.5.2.10 Based on a five and a half day working week, or 24 days in each month, the residue equates to an average of 82 deliveries per day. Assuming that deliveries are made between 08:00-18:00 this gives an average of 8 deliveries per hour, or 16 two-way trips.
- 15.5.2.11 As part of the requirements of the Construction Phase Traffic Management Plan which will be secured by Development Consent Obligation it is expected that all HGVs will be required to travel to and from the site via the M4 and Fabian Way, in order to avoid routing HGV traffic through Swansea city centre.
- 15.5.2.12 Based on the above assumptions, the profile of construction related traffic movements throughout the day is presented in Table 15.7 below.

Table 15.7 Construction traffic daily profile – two way trips

Time Period	Staff		Deliveries		Total	
	HGVs	All vehicles	HGVs	All vehicles	HGVs	All vehicles
06:00-07:00	0	133	0	0	0	133
07:00-08:00	0	267	0	0	0	267
08:00-09:00	0	8	16	16	16	24
09:00-10:00	0	8	16	16	16	24
10:00-11:00	0	8	16	16	16	24
11:00-12:00	0	8	16	16	16	24
12:00-13:00	0	8	16	16	16	24
13:00-14:00	0	8	16	16	16	24
14:00-15:00	0	8	16	16	16	24
15:00-16:00	0	8	16	16	16	24

Time Period	Staff		Deliveries		Total	
	HGVs	All vehicles	HGVs	All vehicles	HGVs	All vehicles
16:00-17:00	0	8	16	16	16	24
17:00-18:00	0	8	16	16	16	24
18:00-19:00	0	400	0	0	0	400
TOTAL	0	880	164	164	164	1,044

- 15.5.2.13 Figure 15.7 below illustrates existing westbound traffic on Fabian Way, to the east of the Park & Ride junction, combined with construction phase traffic.

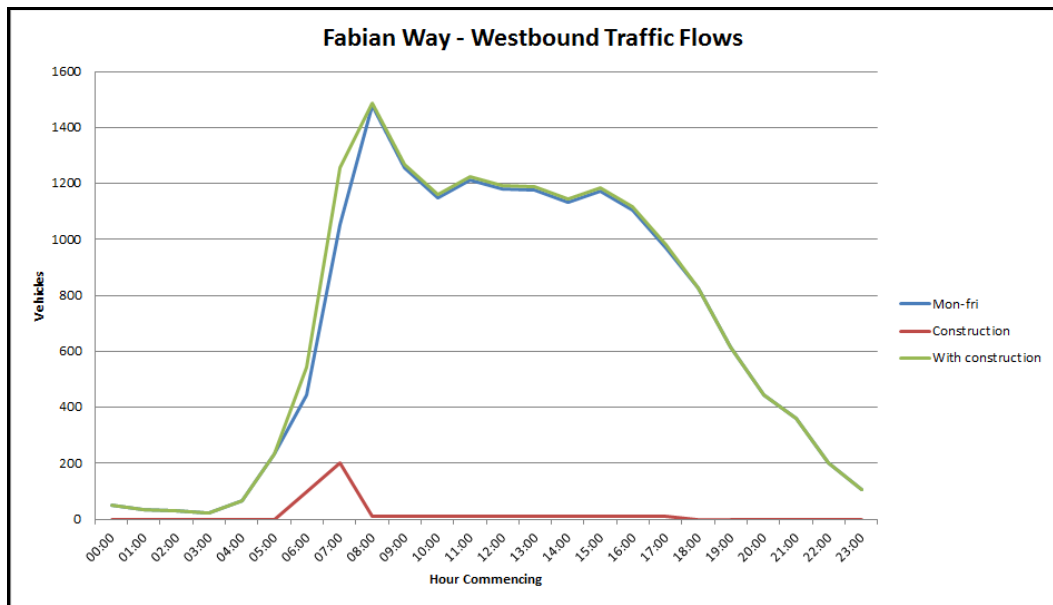


Figure 15.7 Construction traffic on Fabian Way - westbound

- 15.5.2.14 Most construction staff will arrive at the site between 06:30-07:30, before the current peak hour of 08:00-09:00. Including the construction traffic, the combined westbound flow between 07:00-08:00 is expected to increase by 19% from 1,055 to 1,255 veh/hr, and will therefore remain below the current AM peak flow of 1,477 veh/hr.
- 15.5.2.15 Figure 15.8 illustrates the existing eastbound traffic flows on Fabian Way, to the east of the Park & Ride junction, combined with construction phase traffic.

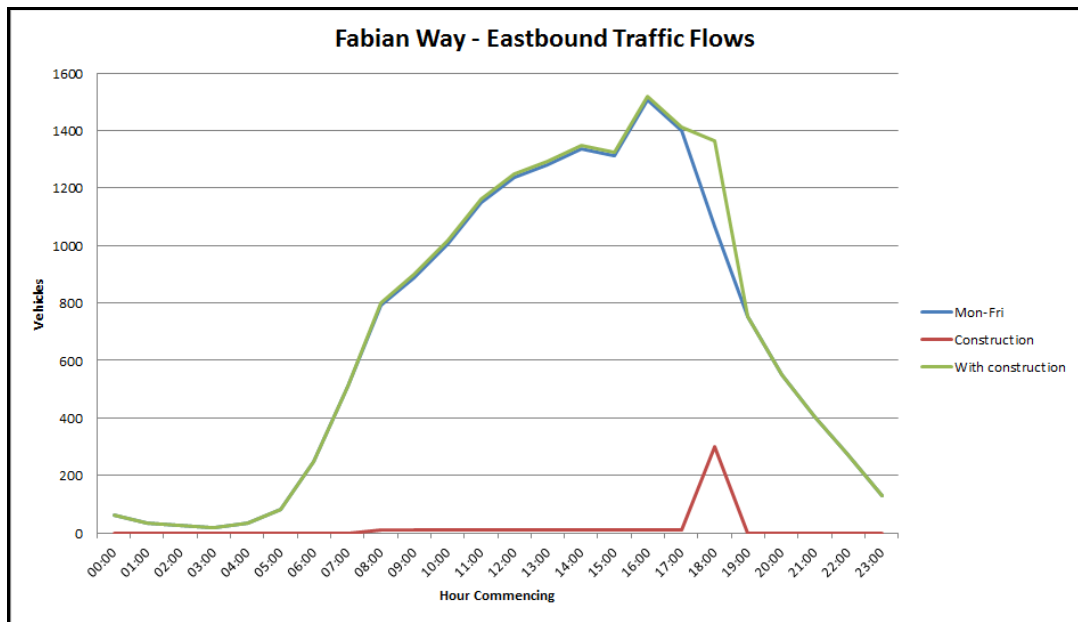


Figure 15.8 Construction traffic on Fabian Way - eastbound

- 15.5.2.16 The existing peak flow of 1,508 veh/hr occurs between 16:00-17:00. The majority of construction staff will leave the site between 18:00-19:00. Including the construction traffic the combined westbound flow between 18:00-19:00 is expected to increase by 28% to 1,366 veh/hr and will remain below the current peak flow.
- 15.5.2.17 Two-way flows on Fabian Way are presented in Figure 15.9 below, and demonstrate that construction traffic will have a negligible impact on the existing AM and PM peak hour flows.

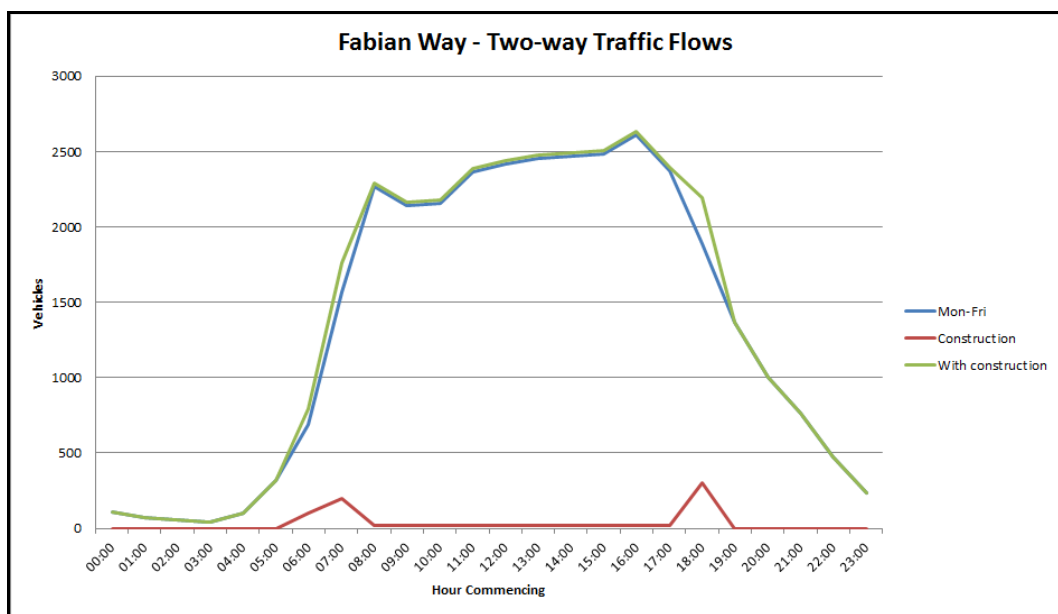


Figure 15.9 Construction traffic on Fabian Way – two-way flows

- 15.5.2.18 Distribution of the construction related traffic onto the local highway network is presented in Table 15.8 below.

Table 15.8 Daily two-way construction traffic flows

Location	Staff		Deliveries		Total	
	HGVs	All veh	HGVs	All veh	HGVs	All veh
Quay Parade	0	187	0	0	0	187
East Bank Way	0	33	0	0	0	33
King's Road	0	0	0	0	0	0
Fabian Way – east of East Bank Way	0	220	0	0	0	220
Fabian Way west of Port Tennant junction	0	220	0	0	0	220
Fabian Way east of Port Tennant junction	0	220	0	0	0	220
Fabian Way - west of P&R junction	0	220	0	0	0	220
Langdon Road	0	880	164	164	164	1044
Fabian Way - east of P&R junction	0	660	164	164	164	824
Fabian Way - west of Baldwin's Crescent	0	660	164	164	164	824
Fabian Way - east of Baldwin's Crescent	0	660	164	164	164	824
Fabian Way – west of Elba Crescent	0	660	164	164	164	824
Fabian Way – east of Elba Crescent	0	660	164	164	164	824
Fabian Way – west of Ffordd Amazon	0	660	164	164	164	824
Ffordd Amazon	0	0	0	0	0	0
B4290	0	176	0	0	0	176
Fabian Way – west of Fford Amazon	0	484	164	164	164	648
A483 – west of A48 junction	0	264	41	41	41	305
A48 – north of A483 junction	0	176	41	41	41	217
A48 – south of A483 junction	0	88	0	0	0	88

15.5.2.19 The impact of the construction traffic on the local highway network is presented in Table 15.9 below.

Table 15.9 Impact of construction phase traffic

Location	Base Traffic		Construction		Total		Increase	
	HGVs	All veh	HGVs	All veh	HGVs	All veh	HGVs	All veh
Quay Parade	1,074	46,255	0	187	1,074	46,442	0%	0.4%
East Bank Way	595	21,041	0	33	595	21,074	0%	0.2%
King's Road	49	4,675	0	0	49	4,675	0%	0%
Fabian Way – east of East Bank Way	1,025	36,643	0	220	1,025	36,863	0%	0.6%
Fabian Way – west of Port Tennant junction	1,077	33,610	0	220	1,077	33,830	0%	0.7%
Fabian Way – east of Port Tennant junction	1,096	32,255	0	220	1,096	32,475	0%	0.7%
Fabian Way - west of P&R junction	1,039	32,383	0	220	1,039	32,603	0%	0.7%
Langdon Road	1,007	9,157	164	1,044	1,171	10,201	16.3%	11.4%
Fabian Way - east of P&R junction	1,355	33,335	164	824	1,519	34,159	12.1%	2.5%
Fabian Way - west of Baldwin's Crescent	1,498	32,289	164	824	1,662	33,113	10.9%	2.6%
Fabian Way - east of Baldwin's Crescent	1,684	32,386	164	824	1,848	33,210	9.7%	2.5%
Fabian Way – west of Elba Crescent	1,339	32,255	164	824	1,503	33,079	12.2%	2.6%
Fabian Way – east of Elba Crescent	1,369	32,523	164	824	1,533	33,347	12%	2.5%
Fabian Way – west of Ffordd Amazon	1,385	32,328	164	824	1,549	33,152	11.8%	2.5%
Ffordd Amazon	267	1,028	0	0	267	1,028	0%	0%
B4290	193	4,604	0	176	193	4,780	0%	3.8%
Fabian Way – west of Fford Amazon	1,558	30,044	164	648	1,722	30,692	10.5%	2.2%
A483 – west of A48 junction	1,016	14,908	41	305	1,057	15,231	4.0%	2.0%
A48 – north of A483 junction	1,466	26,550	41	217	1,507	26,767	2.8%	0.8%
A48 – south of A483 junction	1,158	26,194	0	88	1,158	26,282	0%	0.3%

15.5.2.20 Construction phase traffic will result in an increase in daily traffic of up to 2.6% on Fabian Way to the east of the Park & Ride junction (Junction 3), and up to 0.7% to the west. On Langdon Road, traffic is predicted to increase by 11.4%. In terms of HGV traffic, there will be an increase of approximately 12% on Fabian Way to the east of the Park & Ride junction. On Langdon Road, HGV traffic will increase by 16%. As noted in section 15.4.5.2, the impacts on Langdon Road are calculated using baseline traffic data obtained prior to ABP changing the location of their main port access from Junction 3 to Junction 4. If ABP continue to use Junction 4 during the construction period, traffic flows on Langdon Road would actually be lower than those shown in Table 15.9, although the percentage increase due to construction traffic would be higher than shown in the table.

- 15.5.2.21 Although it has been demonstrated that construction traffic will have a negligible impact on the current AM and PM peak hour traffic flows, there will be increases in flows prior to the morning peak and after the evening peak. The construction traffic is therefore expected to have a short-term **minor adverse** impact on the local highway network.
- 15.5.2.22 The potential effects on the bus network of additional patronage could include delays due to buses becoming full, crowding on buses and congestion at bus stops. Measures will be taken to encourage construction staff to travel by sustainable means, and these will be outlined in the Construction Phase Travel Plan. However, it is not anticipated that many construction staff will travel by bus, and instead the focus will be on promoting cycling for local staff and car sharing for staff travelling from further afield. Therefore the effect of the construction phase on public transport is expected to be **negligible**.
- 15.5.2.23 There will be some impact on amenity for existing cyclists due to the increase in traffic on roads leading to the Project area, particularly along the short length of Langdon Road to the east of the Park & Ride junction. However, a segregated pedestrian/cycle lane will be provided on the new roads constructed within the Project area and along the portion of Langdon Road proposed to be upgraded. In accordance with the significance criteria described in Table 15.1, the impact of construction on pedestrian and cyclist amenity is expected to be **negligible**.

15.5.3 Assessment of impacts during operation

Operation & maintenance impacts

- 15.5.3.1 Traffic associated with the daily operation and maintenance of the Project is anticipated to be minimal. O&M staff are required to be on site 24 hours a day. Therefore, a total of 21 O&M staff are likely to be operating on a 3 shift system, and would be travelling to and from the site during off-peak hours. There will also be approximately 52 staff required to service the visitor and recreational facilities.

Leisure use

- 15.5.3.2 It is intended that the Project will form a new focal point as a tourist attraction within the Bay, and therefore an assessment of the impact of the leisure related traffic has been made.
- 15.5.3.3 In order to estimate the number of car trips generated by the leisure use during the operational phase, a first principles approach has been used. It has been estimated that the Project could attract between 70,000 - 100,000 visitors a year, as well as spectators attending major sporting events.
- 15.5.3.4 Visitor numbers are predicted to be seasonal, and the majority of people are predicted to visit the Project during weekends and holiday periods. It has been assumed that these 'peak' periods will include the following:
- | | |
|------------------------------------|----------|
| Weekends (March to October) | 70 days |
| Summer & Easter holidays (8 weeks) | 40 days |
| Total | 110 days |
- 15.5.3.5 'Off-peak' days will therefore total $365 - 110 = 255$ days.

- 15.5.3.6 During 'off-peak' days it has been assumed that 50 visitors/day will visit the Lagoon, equating to $255 \times 50 = 12,750$ visitors/year.
- 15.5.3.7 'Peak' days would therefore attract $100,000 - 12,750 = 87,250$ visitors/year. This equates to an average of $87,250 \div 110 = 793$ visitors/day.
- 15.5.3.8 To allow for seasonality within the 'peak' days (visitor numbers at weekends in July and August are expected to be higher than weekends in March, for example), it has been assumed that visitor numbers during the high season would be 50% higher than the average, equating to $793 \times 1.50 = 1,190$ visitors/day.
- 15.5.3.9 In order to determine the mode split of visitors travelling to the site reference was made to the Trip Rate Information Computer System (TRICS) database. Within the 'Marinas' and 'Watersports Centres' categories, which are considered to be the most relevant uses, no multi-modal surveys are available. Reference was therefore made to the 'Leisure Parks' category, where three multi-modal surveys are available and which are considered to be an appropriate basis for assessment purposes with some adjustment, which is detailed below. Based on the TRICS data for these sites, the modal split for Leisure Parks is as shown in Table 15.10. Copies of the TRICS output are presented in Appendix 15.3.

Table 15.10 Leisure Parks – modal split

Origin	Proportion
Car – driver	40%
Car – passenger	49%
Walk	9%
Cycle	0%
Public transport	2%
TOTAL	100%

- 15.5.3.10 The Leisure Parks category includes developments with cinemas, bowling alleys, etc. and therefore these sites will attract most visitors in the evenings. This may help to explain the low proportion (0.1%) for cycling. The Project will include new pedestrian and cycle links from Fabian Way to encourage the use of sustainable modes of travel, and it is estimated that visitor arrivals will be spread more evenly throughout the day. Taking these factors into consideration, the modal split assumed for the Project is shown in Table 15.11 below.

Table 15.11 Operational phase – assumed modal split

Origin	Proportion
Car – driver	40%
Car – passenger	40%
Walk	10%
Cycle	5%
Public transport	5%
TOTAL	100%

- 15.5.3.11 Applying this modal split to the maximum number of visitors a day gives the number of trips by each mode, as shown in Table 15.12.

Table 15.12 Operational phase – trips by mode

Origin	Trips
Car – driver	476
Car – passenger	476
Walk	119
Cycle	60
Public transport	60
TOTAL	1,190

15.5.3.12 In order to predict the distribution of visitor arrivals and departures by car throughout the day, reference was made to the ‘Marinas’ category in the TRICS database. The car trip arrival and departure profiles for Marinas were applied to the predicted number of car trips generated by the Project, and are presented in Table 15.13. It has also been assumed that there will be approximately 51 staff employed at the Visitor Centre and 21 on O&M operations, and that these staff will generate 20 arrivals by car in the morning (08:00-9:00) and 20 departures in the evening (17:00-18:00). These trips are also shown below.

Table 15.13 Operational phase car trips

Time Period	Visitors		Staff		Combined		
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Total
06:00-07:00	0	0	0	0	0	0	0
07:00-08:00	15	6	0	0	15	6	22
08:00-09:00	23	13	20	0	43	13	56
09:00-10:00	32	21	0	0	32	21	53
10:00-11:00	43	29	0	0	43	29	72
11:00-12:00	46	35	0	0	46	35	81
12:00-13:00	49	46	0	0	49	46	95
13:00-14:00	44	44	0	0	44	44	88
14:00-15:00	45	50	0	0	45	50	95
15:00-16:00	53	57	0	0	53	57	110
16:00-17:00	35	57	0	0	35	57	92
17:00-18:00	27	45	0	20	27	65	92
18:00-19:00	23	28	0	0	23	28	51
19:00-20:00	18	21	0	0	18	21	39
20:00-21:00	12	13	0	0	12	13	24
21:00-22:00	10	11	0	0	10	11	21
22:00-23:00	0	2	0	0	0	2	3
23:00-24:00	0	0	0	0	0	0	0
TOTAL	476	476	20	20	496	496	992

- 15.5.3.13 The assumed distribution of operational traffic on the local highway network is shown in Table 15.14 below.

Table 15.14 Operational phase traffic distribution

Origin	Proportion
Swansea	33%
M4 (east)	30%
M4 (west)	17%
A48 (to Neath/Port Talbot)	10%
B4290 / A465 (via M4 J43)	10%
TOTAL	100%

- 15.5.3.14 Based on the above distribution, approximately two thirds of the traffic (67%) will originate from the east, or a total of 661 two-way trips/day.
- 15.5.3.15 Figure 15.10 below illustrates existing westbound traffic flows at weekends on Fabian Way, to the east of the Park & Ride junction, combined with the operational phase traffic. Also shown is the weekday traffic profile for comparison.

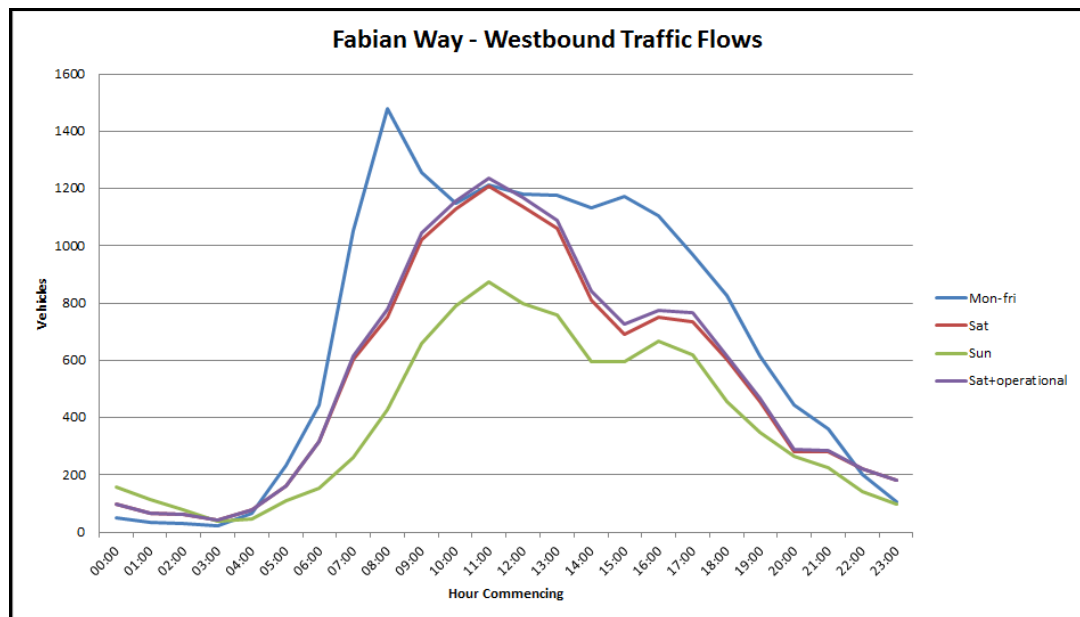


Figure 15.10 Operational phase traffic on Fabian Way - westbound

- 15.5.3.16 For westbound traffic the peak flow on a Saturday is currently 1,207 veh/hr and occurs between 11:00-12:00. Including the operational traffic, the combined westbound peak flow is expected to increase by approximately 2.6% to 1,238 veh/hr, which remains below the weekday peak of 1,477 veh/hr.
- 15.5.3.17 Figure 15.11 illustrates existing eastbound traffic flows at weekends on Fabian Way, to the east of the Park & Ride junction, combined with the operational phase traffic. The weekday traffic profile is also shown for comparison.

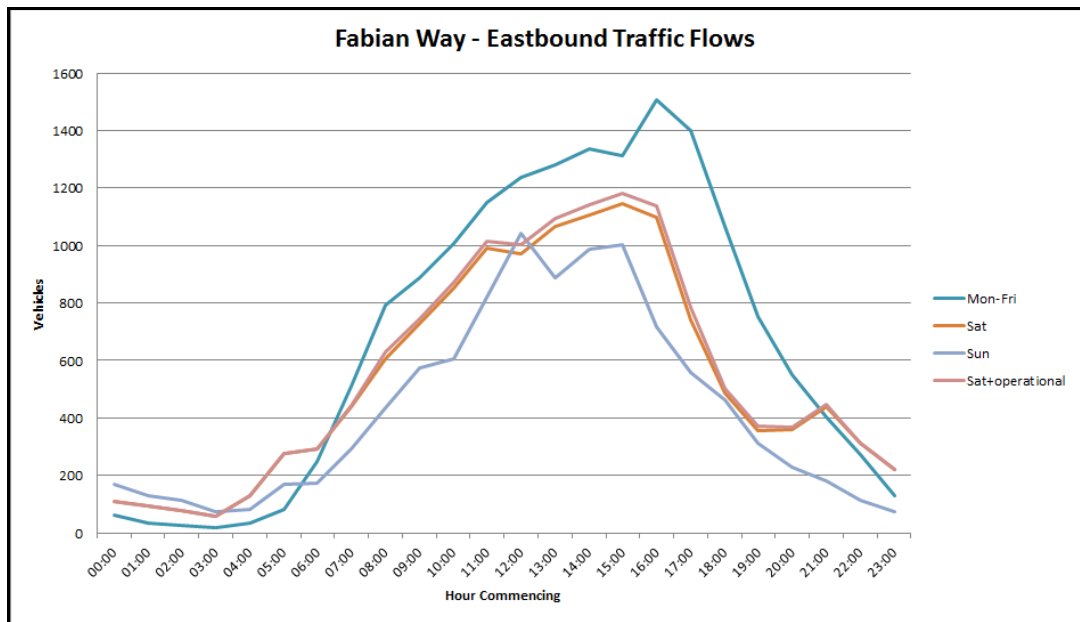


Figure 15.11 Operational phase traffic on Fabian Way - eastbound

- 15.5.3.18 For eastbound traffic, the peak flow on a Saturday is currently 1,144 veh/hr and occurs between 15:00-16:00. Including the operational phase traffic, the combined westbound peak flow is expected to increase by approximately 3.3% to 1,182 veh/hr, which remains below the weekday peak of 1,508 veh/hr.
- 15.5.3.19 The two-way flows on Fabian Way are presented in Figure 15.12, and demonstrate that even with the addition of the peak operational phase traffic, weekend traffic flows will remain lower than weekday flows.

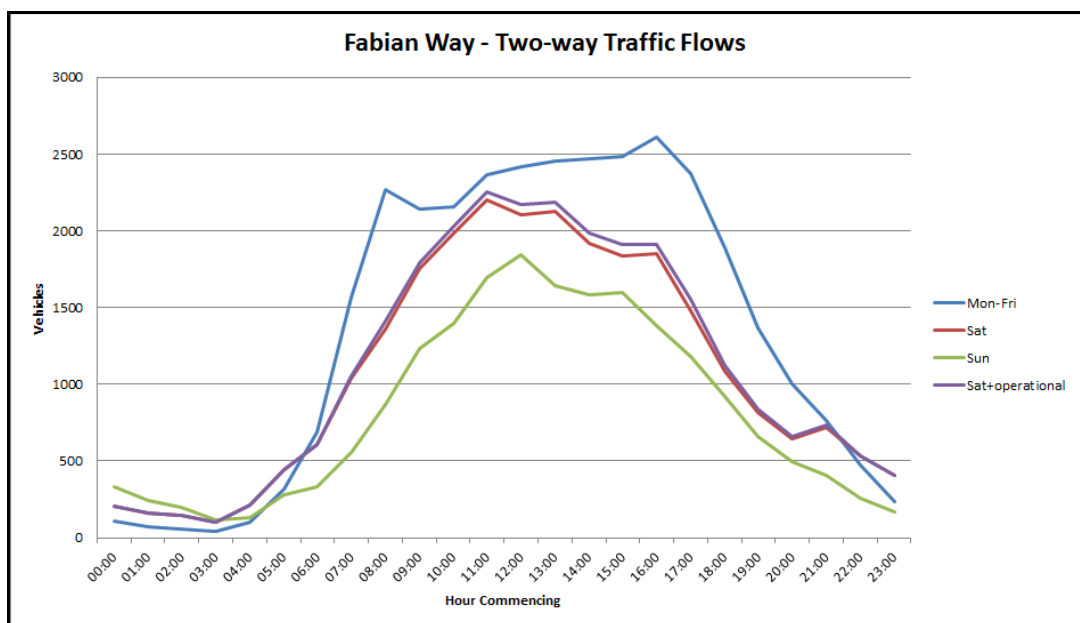


Figure 15.12 Operational phase traffic on Fabian Way – two-way flows

Major events

- 15.5.3.20 The Lagoon will be capable of holding major sailing events, and it is anticipated that these events may attract up to 8,000 spectators per day. These would be one-off events and would require temporary measures to manage vehicle and spectator movements to and from the site. To that end the need for a Framework Major Events Travel Plan that will form the basis of a formal Travel Plan has been discussed with CCSC and NPTCBC during consultation. The final Major Events Travel Plan will be submitted to the CCSC, NPTCBC and other relevant bodies with sufficient time for it to be approved prior to any major events taking place.
- 15.5.3.21 Major sporting events are likely to take place at weekends and Bank Holidays. An example of the type of event being considered is the Cardiff Festival, held over the August Bank Holiday weekend in 2013. The festival featured Extreme Sailing, in addition to junior sailing events, windsurfing events, a food market, music and other attractions. The Festival events ran throughout each day, starting at 08:00 and finishing at 20:00.
- 15.5.3.22 In order to determine the potential impact of these events on the local highway network, classified turning counts were undertaken on a Saturday in November 2013, to determine traffic flows at key junctions along Fabian Way. The survey data is presented in Appendix 15.2. The classified counts were carried out between 08:00-17:00 on 09 November 2013 at the following junctions:
- i. Fabian Way/Kings Road/East Bank Way/Quay parade junction (Junction 1);
 - ii. Fabian Way/Port Tennant Road/SA1 Access junction (Junction 2);
 - iii. Fabian Way/Park & Ride Access/Langdon Road junction (Junction 3);
 - iv. Langdon Road roundabout;
 - v. Fabian Way/Baldwins Crescent junction sliproads (Junction 4);
 - vi. Fabian Way/Elba Crescent junction (Junction 6);
 - vii. Fabian Way/Ffordd Amazon/B4290 junction (Junction 7); and
 - viii. A483 Fabian Way/A43 junction (Junction 8).
- 15.5.3.23 Based on the results of the traffic surveys, the peak hour on Fabian Way was identified as 12:00-13:00.
- 15.5.3.24 Major sporting events will require temporary measures to manage traffic movements, including the provision of off-site parking and shuttle buses to the site. It is likely that the normal visitor parking will be restricted to competitors and Blue Badge holders only during these events. As the location of the off-site parking has not yet been determined, broad assumptions regarding distribution of the event traffic on the local network has been made in order to gain an understanding of the potential impacts of a major event on the local highway network. This has been discussed with CCSC and NPTCBC.
- 15.5.3.25 The modal split assumed for visitors travelling to major events has been based on the modal split assumed for the operational phase assessment, as shown in Table 15.11. As major events are likely to attract visitors from further afield, and parking at the Lagoon will not be available, it has been assumed that a higher proportion will travel by public transport and there will be more car sharing, with a lower proportion travelling by walking. The modal split assumed for major events is shown in Table 15.15.

Table 15.15 Major events – assumed modal split

Origin	Proportion
Car – driver	30%
Car – passenger	45%
Walk	5%
Cycle	5%
Public transport	15%
TOTAL	100%

- 15.5.3.26 Applying this modal split to the maximum number of visitors a day gives the number of trips by each mode, as shown in Table 15.16.

Table 15.16 Major events – trips by mode

Origin	Trips
Car – driver	2,400
Car – passenger	3,600
Walk	400
Cycle	400
Public transport	1,200
TOTAL	8,000

- 15.5.3.27 The assumed distribution of visitor traffic on the local highway network is shown in Table 15.17 below.

Table 15.17 Major event visitor traffic distribution

Origin	Proportion
Swansea	25%
M4 (east)	35%
M4 (west)	20%
A48 (to Neath/Port Talbot)	10%
B4290 / A465 (via M4 J43)	10%
TOTAL	100%

- 15.5.3.28 It has been assumed that there will be no spectator parking available at the Project, except for Blue Badge holders. All visitors will therefore have to park off-site, and travel to the Project by shuttle bus.
- 15.5.3.29 As discussed above, the location of off-site parking has not yet been determined and will be subject to a Major Events Travel Plan. For the purpose of this assessment it has been assumed that town centre car parks could be used by some visitors, with regular shuttle buses running between Swansea bus station and the Project, possibly via the railway station. Visitor traffic would therefore travel along Fabian Way into the town centre,

providing a robust assessment of impacts on Fabian Way. It has also been assumed that a temporary park & ride facility would be made available to the north of Swansea, with a shuttle bus service operating between it and the Project via the town centre.

- 15.5.3.30 It has been assumed that traffic arriving from the M4 (east) and the A48 will travel into Swansea city centre along Fabian Way and use the town centre car parks; traffic from the M4 (west) and the A465 will use a temporary park & ride facility to the north of Swansea; and local traffic will use both options. Based on these assumptions and the distribution shown in Table 15.17, approximately 45% of visitor traffic would travel along Fabian Way through the area of the highway network under consideration in this assessment, providing a robust assessment of impacts on the network.
- 15.5.3.31 The distribution of visitor arrivals and departures by car throughout the event day was based on the distribution assumed for the operational phase, as shown in Table 15.13. The same profile was applied to the number of car trips predicted for major events, and is presented in Table 15.18.

Table 15.18 Major event car trips

Time period	Arrivals	Departures	Total
06:00-07:00	0	0	0
07:00-08:00	76	32	109
08:00-09:00	117	63	180
09:00-10:00	163	104	266
10:00-11:00	218	146	364
11:00-12:00	232	177	409
12:00-13:00	248	233	481
13:00-14:00	224	220	444
14:00-15:00	229	250	478
15:00-16:00	266	286	552
16:00-17:00	177	289	466
17:00-18:00	136	225	360
18:00-19:00	115	140	255
19:00-20:00	89	107	196
20:00-21:00	58	64	122
21:00-22:00	50	54	104
22:00-23:00	1	12	13
23:00-24:00	0	0	0
TOTAL	2,400	2,400	4,800

- 15.5.3.32 The peak two-way flow of 552 vehicles occurs between 15:00-16:00. However, in order to provide a robust assessment of the impact of the event traffic, this peak hour traffic flow has been superimposed onto the background peak, which occurs between 12:00-13:00 based on the results of the traffic surveys undertaken. Traffic flow diagrams showing the visitor traffic are presented in Appendix 15.4.

- 15.5.3.33 Visitors arriving by car or public transport would require transport to the Project from temporary park & ride facilities or from Swansea town centre. Based on the assumed modal split shown in Table 15.16, approximately 5,580 visitors would travel this way. The arrival profile outlined in Table 15.18, shows that the maximum number of spectators expected to arrive in one hour is approximately 12% of the total, which equates to 670 people. In order to meet this demand, approximately 17 shuttle buses per hour would be required, assuming a capacity of 40 passengers per bus. A similar demand from visitors returning in the opposite direction could be expected in the afternoon/evening. To ensure the assessment is robust, it has been assumed that 20 shuttle buses per hour would travel between the Project and the town centre via Fabian Way. Traffic flow diagrams showing the shuttle bus traffic are presented in Appendix 15.4.
- 15.5.3.34 It has been assumed that parking at the Project would be made available to staff, competitors and Blue Badge holders only. To ensure that the assessment is robust, it has been assumed that some temporary car parking will be made available in addition to the permanent parking, and a total of 500 spaces will be available for events. Staff and competitors are likely to arrive earlier in the day than visitors, and this traffic would therefore not coincide with the peak hour identified (12:00-13:00). To ensure that the assessment is robust, it has been assumed that during the peak hour a total of 100 staff/competitor vehicles will arrive at the Project and 50 vehicles will depart.
- 15.5.3.35 The assumed distribution of staff/competitor traffic on the local highway network is shown in Table 15.19 below.

Table 15.19 Major event staff/competitor traffic distribution

Origin	Proportion
Swansea	20%
M4 (east)	55%
M4 (west)	15%
A48 (to Neath/Port Talbot)	5%
B4290 / A465 (via M4 J43)	5%
TOTAL	100%

- 15.5.3.36 Traffic flow diagrams showing the staff/competitor traffic are presented in Appendix 15.4.
- 15.5.3.37 First power exported from the Lagoon is anticipated in summer 2018, with all construction works complete (on and offshore facilities) in the beginning of 2019. Capacity assessments have been undertaken for 2018, with and without the event traffic. In order to factor the traffic flows obtained from the 2013 baseline up to 2018 flows, TEMPRO v.6.2 growth factors have been used, and adjusted for local growth using NTEM traffic growth calculations. Growth rates for principal urban roads in the Swansea authority area have been used, and the growth rate is presented in Table 15.20 below.

Table 15.20 Traffic growth rate

Period	Saturday
2013 - 2018	1.0524

- 15.5.3.38 This growth factor has been applied to the 2013 traffic survey flows to obtain baseline flows for 2018. The impact of the traffic generated by major events on the local highway network has been assessed for each junction, and the results are summarised below.

Fabian Way/ Quay Parade/ East Bank Way/ Kings Road Junction – Junction 1

- 15.5.3.39 The Fabian Way/ Quay Parade/ East Bank Way/ Kings Road junction was tested using the LinSig v3.1 software published by Transport Research Laboratory (TRL). LinSig is a widely used tool for the assessment of capacity at signal controlled junctions. The critical outputs are the Practical Reserve Capacity (PRC) and predicted queue length in passenger car units (pcus) for each approach. To allow for a performance margin the desirable maximum degree of saturation for any link is usually considered to be 90%, which equates to a PRC of zero.
- 15.5.3.40 Traffic signal information for the junction, including phasing, staging and intergreen times, was obtained from CCSC. The results of the LinSig assessments are shown in Table 15.21. Ahead, right turn and left turn movements are indicated by A, R and L respectively. Queue lengths shown in brackets are observed queues obtained from the traffic surveys and are provided for validation purposes. The LinSig output is contained in Appendix 15.5.

Table 15.21 Fabian Way/ Quay Parade/ East Bank Way/ Kings Rd Junction - Saturday 12:00-13:00

Arm		2013 Baseline		2018 Baseline		2018 Base + Event	
		Deg Sat	MMQ	Deg Sat	MMQ	Deg Sat	MMQ
1/1	Quay Parade – A	36.4%	7 (3)	38.3%	7	42.2%	8
½	Quay Parade – A	37.8%	7 (3)	39.8%	8	43.7%	9
2/1	East Bank Way – L	35.2%	5 (3)	37.0%	6	45.2%	7
2/2	East Bank Way – L A	36.2%	6 (4)	38.1%	6	45.9%	7
2/3	East Bank Way – R	51.8%	9 (14)	54.7%	9	57.7%	9
2/4	East Bank Way – R	53.3%	9 (5)	55.7%	10	58.7%	10
2/5	East Bank Way – R	51.4%	8 (6)	54.2%	9	57.1%	9
3/1	Fabian Way – A	53.0%	10 (14)	55.9%	11	58.4%	12
3/2	Fabian Way – A	53.0%	10 (12)	55.9%	11	58.4%	12
3/3	Fabian Way – A	53.1%	10 (11)	56.0%	11	58.3%	12
4/1	Kings Road – L	23.0%	2 (0)	25.3%	2	25.5%	2
8/1	Fabian Way Bus Lane – A	19.9%	1 (0)	19.9%	1	46.5%	2
PRC		69.0%		60.7%		53.2%	
Cycle time (seconds)		104		104		104	

- 15.5.3.41 The results indicate that the junction currently operates within capacity and would continue to operate within capacity until 2018, even with the additional event traffic.

Fabian Way/ Port Tennant/ SA1 Access Junction – Junction 2

- 15.5.3.42 The Fabian Way/ Port Tennant/ SA1 access junction was tested using the LinSig v3.1 software. Traffic signal information for the junction, including phasing, staging and intergreen times, was obtained from CCSC.
- 15.5.3.43 All pedestrian phases are demand dependant, and so some stages would not be called without pedestrian demand. The staging diagram includes seven stages, and it was found that the queuing observed during the traffic surveys was most closely replicated when Stage 2, which includes 4 pedestrian movements, was not included in the stage sequence. The results of the LinSig assessments are shown in Table 15.22. Queue lengths shown in brackets are observed queues obtained from the traffic surveys and are provided for validation purposes. The LinSig output is contained in Appendix 15.6.

Table 15.22 Fabian Way/ Port Tennant/ SA1 Access Junction - Saturday 12:00-13:00

Arm		2013 Baseline		2018 Baseline		2018 Base + Event	
		Deg Sat	MMQ	Deg Sat	MMQ	Deg Sat	MMQ
1/1	Fabian Way (W) – A L	50.6%	11 (17)	53.3%	12	61.1%	15
1/2	Fabian Way (W) – A	52.5%	13 (18)	55.3%	14	62.7%	17
1/3+1/4	Fabian Way (W) – R	7.7%	1 (3)	8.1%	1	8.1%	1
2/1	Port Tennant Rd – L A	30.3%	2 (2)	32.1%	2	35.3%	2
2/2	Port Tennant Rd – R	79.6%	6 (8)	83.6%	7	91.9%	9
3/1	Fabian Way (E) – L	8.8%	1 (3)	9.3%	1	9.1%	1
3/2	Fabian Way (E) – A	81.1%	19 (16)	85.7%	21	93.1%	26
3/3+3/4	Fabian Way (E) – A R	82.4%	19 (14)	86.6%	21	93.5%	27
4/1	SA1 Access – L	38.0%	2 (4)	39.7%	2	39.7%	2
4/2+4/3	SA1 Access – R A	47.0%	2 (6)	49.4%	3	49.4%	3
8/1	Bus Lane – A	24.6%	1 (0)	24.6%	1	55.2%	3
PRC		9.3%		3.9%		-3.8%	
Cycle time (seconds)		120		120		120	

- 15.5.3.44 The results indicate that the junction currently operates within capacity and would continue to operate within capacity until 2018. With the addition of the event traffic the Degree of Saturation on the Fabian Way (E) and Port Tennant arms would exceed 90% and so the junction would be operating at close to, but still within, capacity.

Fabian Way/ Park & Ride Access Junction – Junction 3

- 15.5.3.45 The Fabian Way/ Park & Ride access junction was tested using the LinSig v2.1 software. Traffic signal information for the junction, including phasing, staging and intergreen times, was obtained from CCSC. The results of the LinSig assessments are shown in Table 15.23. Queue lengths shown in brackets are observed queues obtained from the traffic surveys and are provided for validation purposes. The LinSig output is contained in Appendix 15.7.

Table 15.23 Fabian Way/ Park & Ride Access Junction - Saturday 12:00-13:00

Arm		2013 Baseline		2018 Baseline		2018 Base + Event	
		Deg Sat	MMQ	Deg Sat	MMQ	Deg Sat	MMQ
1/1	Fabian Way (W) – A L	57.6%	19 (4)	60.6%	20	70.4%	24
1/2	Fabian Way (W) – R	44.1%	3 (1)	46.3%	3	68.6%	5
2/1	Fabian Way (E) – A L	71.1%	26 (29)	74.8%	28	89.8%	38
2/2	Fabian Way (E) – R	28.6%	2 (4)	30.0%	2	30.0%	2
3/1	P&R Access – R A	3.5%	0 (0)	3.5%	0	3.5%	0
3/2	P&R Access – L	12.4%	1 (1)	12.9%	1	12.9%	1
4/1	Langdon Rd – R	65.0%	4 (4)	68.5%	4	80.6%	6
4/2	Langdon Rd – L A	64.8%	4 (0)	67.9%	4	85.7%	7
PRC		26.6%		20.3%		0.3%	
Cycle time (seconds)		90		90		90	

- 15.5.3.46 The results indicate that the junction currently operates within capacity and would continue to operate within capacity until 2018. The addition of the major event traffic would result in some increased queuing on the Fabian Way (E) approach but junction capacity would not be exceeded.

Langdon Road Roundabout – south of Junction 3

- 15.5.3.47 The roundabout on Langdon Road, to the south of the Fabian Way/Park & Ride Access junction (Junction 3), was tested using the Arcady v7.1 software published by TRL. Arcady calculates queues and delays at roundabouts, and the critical outputs are the Ratio of Flow to Capacity (RFC) and the maximum queue predicted for each arm. If the RFC is below 1.00 then the junction is operating within capacity and little or no queuing will result. In order to allow for a performance margin, a value of 0.85 is more typically considered to represent the desirable maximum value.
- 15.5.3.48 Geometric parameters for the assessment were obtained from OS mapping of the junction. The results of the Arcady assessments are shown in Table 15.24. Queue lengths shown in brackets are observed queues obtained from the traffic surveys and are provided for validation purposes. The Arcady output is contained in Appendix 15.8.

Table 15.24 Langdon Road Roundabout - Saturday 12:00-13:00

Arm	2013 Baseline		2018 Baseline		2018 Base + Event	
	RFC	Queue	RFC	Queue	RFC	Queue
Langdon Road (west)	0.08	0 (0)	0.09	0	0.09	0
Fabian Way Link	0.10	0 (0)	0.11	0	0.17	0
Langdon Road (east)	0.13	0 (0)	0.14	0	0.20	0

- 15.5.3.49 The results indicate that the junction currently operates within capacity and would continue to operate within capacity in 2018, even with the additional event traffic.

Fabian Way/ Elba Crescent Junction – Junction 6

- 15.5.3.50 The Fabian Way/ Elba Crescent junction was tested using the LinSig v2.1 software. Traffic signal information for the junction, including phasing, staging and intergreen times, was obtained from NPTCBC. The results of the LinSig assessments are shown in Table 15.25. Queue lengths shown in brackets are observed queues obtained from the traffic surveys and are provided for validation purposes. The LinSig output is contained in Appendix 15.9.

Table 15.25 Fabian Way/ Elba Crescent Junction - Saturday 12:00-13:00

Arm		2013 Baseline		2018 Baseline		2018 Base + Event	
		Deg Sat	MMQ	Deg Sat	MMQ	Deg Sat	MMQ
1/1	Fabian Way (W) – A L	43.7%	19 (13)	46.0%	21	53.2%	25
2/1	Fabian Way (E) – A	38.2%	11 (10)	40.1%	12	46.3%	15
2/2	Fabian Way (E) – R	15.1%	1 (2)	15.9%	1	15.9%	1
3/1	Elba Crescent - L R	14.4%	1 (3)	14.9%	1	14.9%	1
PRC		105.8%		95.4%		69.3%	
Cycle time (seconds)		120		120		120	

- 15.5.3.51 The results indicate that the junction currently operates within capacity and would continue to operate within capacity in 2018, even with the additional event traffic.

Fabian Way/ Ffordd Amazon/ B4290 Junction – Junction 7

- 15.5.3.52 The Fabian Way/ Ffordd Amazon/ B4290 junction was tested using the Transyt 12 software. The method of applying Transyt 12 to signalised roundabouts has been designed to arrive at timings that keep the circulating sections of the roundabout free flowing without resulting in significant congestion on any arms. The method results in entry links running at high degrees of saturation, ideally 85 to 95 %, which should result in circulatory links having lower degrees of saturation, ideally below 80 %. Traffic signal information for the junction, including phasing, staging and intergreen times, was obtained from NPTCBC. The results of the Transyt assessments are shown in Table 15.26. Queue lengths shown in brackets are observed queues obtained from the traffic surveys and are provided for validation purposes. The Transyt output is contained in Appendix 15.10.

Table 15.26 Fabian Way/ Ffordd Amazon/ B4290 Junction - Saturday 12:00-13:00

Link		2013 Baseline		2018 Baseline		2018 Base + Event	
		Sat	Q	Sat	Q	Sat	Q
10	Fabian Way (W) - L	14	1	16	2	14	1
11	Fabian Way (W) - A	35	8	39	9	40	10
12	Circulating - Inside lane	5	0	4	0	6	0
13	Circulating - Outside lane	10	0	9	0	13	0
20	Fford Amazon	9	1	9	1	9	1
21	Circulating - Inside lane	16	1	17	1	17	1
22	Circulating - Outside lane	33	5	35	6	41	6

Link		2013 Baseline		2018 Baseline		2018 Base + Event	
		Sat	Q	Sat	Q	Sat	Q
30	B290 - L R	35	3	36	3	37	3
31	Circulating - Inside lane	34	1	36	1	42	1
32	Circulating - Outside lane	1	0	1	0	1	0
40	Fabian Way (E) - R	19	1	18	1	20	1
41	Circulating - Inside lane	13	1	14	1	14	1
42	Circulating - Outside lane	1	0	1	0	1	0

- 15.5.3.53 The results indicate that the junction currently operates within capacity and would continue to operate within capacity until 2018, even with the additional event traffic.

A483/ A48 Junction – Junction 8

- 15.5.3.54 The A483/ A48 junction was tested using the LinSig v2.1 software. Traffic signal information for the junction, including phasing, staging and intergreen times, was obtained from NPTCBC. The results of the LinSig assessments are shown in Table 15.27. Queue lengths shown in brackets are observed queues obtained from the traffic surveys and are provided for validation purposes. The LinSig output is contained in Appendix 15.11.

Table 15.27 A483/ A48 Junction - Saturday 12:00-13:00

Arm		2013 Baseline		2018 Baseline		2018 Base + Event	
		Deg Sat	MMQ	Deg Sat	MMQ	Deg Sat	MMQ
1/1	A48 S/B - A	21.6%	4 (1)	22.8%	4	22.8%	4
1/2	A48 S/B - A	24.5%	2 (2)	25.7%	3	26.9%	3
2/1	A48 N/B Bridge – A L	38.6%	8 (13)	40.7%	9	42.3%	9
3/1	A48 N/B Internal – A	32.2%	7	33.9%	7	33.9%	7
4/1	A48 S/B Internal – R	32.6%	5	34.2%	5	35.8%	5
5/1	A483 - R	26.1%	3 (2)	27.6%	3	31.6%	4
5/2	A483 - L	37.9%	3 (7)	39.7%	4	41.0%	4
PRC		133.1%		121.4%		112.9%	
Cycle time (seconds)		60		60		60	

- 15.5.3.55 The results indicate that the junction currently operates within capacity and would continue to operate within capacity in 2018, even with the additional event traffic.

Summary of impacts during operational phase

- 15.5.3.56 It is expected that normal weekday operation of the Project will have a negligible impact on local transport networks. Leisure use of the Project will be greatest during weekends and holidays, and therefore does not coincide with the normal commuter peak times. It has been demonstrated that even during the busiest days of the year, traffic flows on the local network will be lower than those that occur regularly during the weekday morning and evening peaks. Therefore, impact at weekends and during holiday periods is expected to be **negligible**.

- 15.5.3.57 Similarly, additional patronage on the bus network will also occur during periods when background demand is lower, and so impact on public transport is expected to be **negligible**.
- 15.5.3.58 The Project will include enhancements to pedestrian and cycle access to the Port area, and will provide new links along the waterfront to SUBC. The provision of new cycle and pedestrian infrastructure complies with policies set out in the UDPs of CCSC (Policies AS2 and AS5) and NPTCBC (Policy 12), described in Section 15.2.4. Based on the significance criteria shown in Table 15.1, impacts on pedestrian and cyclist amenity are considered to be **major beneficial**.
- 15.5.3.59 The Project will be capable of hosting major sporting events, and it is anticipated that these events may attract up to 8,000 spectators a day. These would be one-off events and would require temporary measures to manage vehicle and spectator movements to and from the Project. Based on the assumption that spectators would park off-site and travel to the Project by shuttle bus, it has been demonstrated that all junctions considered in this assessment would have sufficient capacity to accommodate the additional traffic generated.
- 15.5.3.60 In terms of pedestrian and cyclist accessibility and amenity, all access routes for pedestrians and cyclists would remain open during major sporting events. There would be an increase in traffic along Langdon Road and the new Lagoon access road, but these increases would fall below the minimum thresholds set out in Table 15.1 'Significance Criteria' and therefore the impact on pedestrians and cyclists would be **negligible**.
- 15.5.3.61 It has been assumed that shuttle buses will be provided to transfer spectators from off-site car parks. Some spectators will travel into Swansea city centre by bus, and from there travel to the Project by shuttle bus, and therefore there will be an increase in patronage on the existing bus services. However, this will be spread out across all services into and out of Swansea, and therefore the impact on existing public transport services is expected to be **negligible**.

15.5.4 Mitigation measures

- 15.5.4.1 A detailed Construction Phase Travel Plan will be prepared by the contractor and submitted to CCSC and NPTCBC for approval prior to the commencement of any work on site. A copy of the Draft Construction Phase Travel Plan is presented in Appendix 15.12 and was submitted to CCSC and NPTCBC during consultation.
- 15.5.4.2 All construction traffic entering and leaving the site will be closely controlled. Vehicles making deliveries to site or removing spoil or demolition material etc. will travel via designated routes which will have been previously agreed with CCSC, NPTCBC and other relevant bodies.
- 15.5.4.3 Deliveries will be phased on a 'just in time' basis where possible. This will minimise travel time and potential congestion around the site.
- 15.5.4.4 The access and egress of construction traffic will be carefully planned to minimise impacts on the surrounding highway and local road users, including any existing employees occupying other parts of the site. The increase in construction traffic flows will be managed to minimise the impact on the surrounding highways and all local road users, in particular during the morning and evening commuter peak periods. Discussions

will be held with CCSC to agree a safe site access strategy in advance of construction works commencing, and prior to each new construction phase.

- 15.5.4.5 Construction staff will be encouraged to travel to and from the Project by sustainable means. In particular, emphasis will be given to car sharing and the use of minivans. Parking within the Project for construction staff will be managed in order to prevent overspill parking on the surrounding side roads.
- 15.5.4.6 Pedestrian access to the Project will be segregated from vehicular traffic at all times, with clear signage to maintain the safety of the Project and the general public.
- 15.5.4.7 A detailed Operational Phase Travel Plan will be prepared and submitted to CCSC and NPTCBC for approval prior to Visitor access to the Project. The Travel Plan will include initiatives to be employed in order to encourage the use of sustainable modes of transport, including the promotion of public transport, cycling and walking. This complies with policies set out in the UDPs of CCSC and NPTCBC, described in Section 15.2.4, as well as national and regional policy to promote travel choice and sustainable modes of transport.
- 15.5.4.8 A Travel Plan Coordinator will be appointed, and the roles and responsibilities of this position will be detailed in the Travel Plan. The Travel Plan will include targets for a reduction in the proportion of journeys made to the site by car, and proposals for monitoring the success of the Travel Plan initiatives. A copy of the Draft Operational Phase Travel Plan is presented in Appendix 15.13 and was submitted to CCSC and NPTCBC during consultation.
- 15.5.4.9 A separate Major Events Travel Plan will also be prepared and submitted to CCSC, NPTCBC and other relevant bodies for approval prior to any large sporting event being held at the Lagoon. The Major Events Travel Plan will include details of the following:
 - i. definition of what constitutes a major event;
 - ii. expected number of competitors and spectators, including mode of travel;
 - iii. management of vehicular and pedestrian access, including details of off-site parking, any temporary Park & Ride facilities, drop off and pick up arrangements, etc.;
 - iv. details of any temporary road closures or Traffic Management required;
 - v. car and coach parking arrangements;
 - vi. details of police liaison; and
 - vii. access signage and advertising strategy.
- 15.5.4.10 A copy of the Framework Major Events Travel Plan is presented in Appendix 15.14 and was submitted to CCSC and NPTCBC during consultation.

15.6 Residual impacts

15.6.1 Construction phase

- 15.6.1.1 The implementation of the Construction Phase Travel Plan including an access strategy for the Project will help to minimise the impact of construction on all modes of transport. HGV movements along Fabian Way will be managed to ensure that deliveries are timed to avoid the commuter peak periods as far as possible. The residual impact on the local highway network is predicted to be of **minor adverse** significance.
- 15.6.1.2 Impact on public transport during the construction phase is expected to be **negligible**. Impacts on pedestrian and cyclist amenity will also be minimised through the Construction Phase Travel Plan, and the residual impact is considered to be **negligible**.

15.6.2 Operation phase

- 15.6.2.1 Residual impacts on the local highway network are expected to be **negligible** during normal operational use and also during weekends and holiday periods. Implementation of the Major Events Travel Plan will minimise impacts on all modes of transport and will be planned well in advance of each event, in consultation with CCSC, NPTCBC and other stakeholders. As a result of measures included in the Major Events Travel Plan and close liaison with all relevant bodies, it is anticipated that impacts on the local highway network and public transport can be limited to **minor adverse** significance.
- 15.6.2.2 The Project will include enhancements to pedestrian and cycle access to the Port area, and will provide new links along the waterfront to the site of the SUBC. The proposed pedestrian/cycle route supports a Sustrans aspiration to consider improvements to the national cycle route away from Fabian Way. Residual impacts on pedestrian and cyclist amenity are considered to be **major beneficial**.

15.7 Cumulative impact assessment

15.7.1 Screening of potential cumulative schemes

- 15.7.1.1 As identified in Chapter 2: EIA Process and Assessment of Significance, there are a number of developments for which cumulative impacts may occur with the Project. These projects have been screened in Table 15.28, and those developments for which cumulative impacts need to be considered further have been identified.

Table 15.28 Outline cumulative and in-combination assessment projects

Project and location	Current Status	Screening
Swansea University Bay Campus, adjacent to Crymlyn Burrows	Construction Feb 2013 – Sept 2015	Potential cumulative effect – further assessment undertaken.
St Modwens land development - east of Swansea Docks, to west of Neath estuary	Remediation of land, and potential future developments – no details available	No details available
Mumbles pier, foreshore and coastal strip redevelopment	Due to be completed by the end of 2013	Works complete – no cumulative impact anticipated.
Construction of new RNLI Lifeboat Station, Mumbles	Expected completion 2014	Works complete – no cumulative impact anticipated.
SA1 development, Swansea	Development currently taking place, completion date unknown	Potential cumulative effect – further assessment undertaken.
Construction of the southern access road to Coed Darcy Urban Village, crossing nearby Crymlyn Bog	Yet to commence	Potential cumulative effect – further assessment undertaken.
Swansea Boulevard project – work between Princess Way and the Strand, and the River Tawe bridges and The Strand	Phase to be complete in November 2013. Phase 2 to start 2014	Potential cumulative effect – further assessment undertaken.
Wind turbine – on Welsh Water site on Fabian Way	Application – Unsuccessful 25/10/2013	Not considered since the project application was unsuccessful.
Five wind turbines – at Mynydd Marchywel between Rhos and Cilfrew Neath	Submitted Jan 2012. Consultation finished Jan 2013. Still in planning	Distant - no cumulative effect anticipated.
Sixteen wind turbines – at Mynydd Y Gwair, Swansea	Approved – unknown construction timetable	Distant - no cumulative effect anticipated.
Five wind turbines – on land at Mynydd Brombil Farm, Margam Port Talbot	Submitted June 2012, still in planning. Consultation finishes April 2013	Distant - no cumulative effect anticipated.
Atlantic Array Wind Farm – off North Devon Coast approx 35km distant	DCO application submitted but withdrawn in November 2013	Not considered since the project is not proceeding.
Seventy six turbine Pen y Cymoedd wind farm near Neath	Planning approved – construction 2014	Distant - no cumulative effect anticipated.
Llynfi Afan Renewable Energy Park - fifteen turbine wind farm – on land 500m southwest of Cynnonville Port Talbot	Planning permission refused. Application was allowed on appeal on 27/08/2013.	Distant - no cumulative effect anticipated.
Mynydd y Betws- fifteen turbine wind farm located on land to the east of Ammanford in Carmarthenshire	Granted planning consent 2009. Started operating April 2013	Distant - no cumulative effect anticipated.

Project and location	Current Status	Screening
Mynydd y Gwrhyd- windfarm in the Upper Amman and Swansea valleys	Approved on appeal 07/05/2009	Distant - no cumulative effect anticipated.
Newlands Farm, single wind turbine-Margam	Application submitted January 2013	Distant - no cumulative effect anticipated.
Kenfig Industrial Estate single wind turbine	Application submitted. Expected decision by Feb 2014.	Distant - no cumulative effect anticipated.
Port Talbot Harbour redevelopment	Potential future activities/development. Status unknown	Distant - no cumulative effect anticipated.
Upgrading of the existing coastal defence of Aberavon West Promenade, Sandfields, Port Talbot	Completed August 2013.	Works complete – no cumulative impact anticipated
Porthcawl regeneration scheme includes Porthcawl Marina project and 19th century lighthouse restoration	Approved by BCBC – timescale unknown	Distant - no cumulative effect anticipated.
Tata Steel works – Internal Power generation enhancement for Port Talbot steel works- installation of two new boilers and two new turbines housed in new power station building	Application expected to be submitted 2014	Limited information available on timing of proposed construction works, but programmes not anticipated to significantly overlap. Works for Lagoon not predicted to have significant effect on local network and therefore no impact on wider network anticipated. No further cumulative impact assessment.
Underground coal gasification under Swansea Bay	License issued	No cumulative effect anticipated.
Underground coal gasification under Llanelli	Conditional Licence issued	Distant - no cumulative effect anticipated.
Navigational dredging Tawe, Neath and Port Talbot. Existing/proposed dredging in Bristol Channel	On-going	Marine works - no cumulative effect anticipated.
Marine dredging at Monkstone cruising and sailing club and Swansea Marina	On-going maintenance as required	Marine works - No cumulative effect anticipated.
Mumbles Oyster project: Plan to put 10,000 oyster on seabed off the village of Oystermouth	Permission granted September 2013	Marine works - No cumulative effect anticipated
Severn Barrage	Not within foreseeable future.	See footnote Chapter 2.
Swansea Barrage	Operational	Complete -no cumulative effect anticipated.
Cardiff Barrage	Operational	Distant - no cumulative effect anticipated.

Project and location	Current Status	Screening
Baglan Power station	Operational	No cumulative effect anticipated.
Prenergy Biomass Power Station – 350MW wood chip fuelled thermal generating station – Port Talbot	Granted condition approval by BERR on the 20 November 2007. While large scale construction has not been begun, a lawful start of development has occurred and as such the planning permission remains extant.	Limited information available on timing of proposed construction works, but programmes not anticipated to significantly overlap. Works for Lagoon not predicted to have significant effect on local network and therefore no impact on wider network anticipated. No further cumulative impact assessment.
Abernedd Power Station was granted conditional approval by DECC on the 23 February 2011 for construction of a 870MW gas fired combined cycle gas turbine power plant	No lawful start has yet been made to this development	Limited information available on timing of proposed construction works, but programmes not anticipated to significantly overlap. Works for Lagoon not predicted to have significant effect on local network and therefore no impact on wider network anticipated. No further cumulative impact assessment.
Nobel banks aggregate extraction site	Ongoing	Distant - no cumulative effect anticipated
The Swansea Bay (Thomas Shellfish Limited) Mussel Fishery Order	Ongoing	Marine works - No cumulative effect anticipated.
Ro-Ro Ferry – Swansea Port	Currently not operational	No cumulative assessment undertaken.
Rhiannon Offshore Windfarm	Pre-application stage	Distant - no cumulative effect anticipated
Burbo Bank Offshore Windfarm extension	Existing and extension sought 2013	Distant - no cumulative effect anticipated
Tidal Energy Ltd Deltastream Installation Ramsey Sound	Consent secured. Installation 2014	Distant - no cumulative effect anticipated
Seagen Skerries Tidal Stream Array	Consent secured. Installation 2014	Distant - no cumulative effect anticipated
Tidal Stream Energy Demonstration Array St David's Head, Pembrokeshire	Construction is planned to commence in 2017	Distant - no cumulative effect anticipated

15.7.1.2 Each of the cumulative schemes expected to have an impact on local transport networks is described in the following sections.

Swansea University Bay Campus

- 15.7.1.3 SUBC is being developed on a 100-acre site to the south of Fabian Way at Crymlyn Burrows, to the east of the Project. Outline planning permission was granted by NPTCBC in December 2010, and work commenced on site during 2012 with the intention of opening Phase One of the new campus and new student residences by the summer of 2015.
- 15.7.1.4 The development involves the redevelopment of part of a former BP Transit site to provide academic facilities for approximately 5,100 students and residential accommodation for 4,000 students. The campus will also include public buildings and student facilities. Two new junctions on Fabian Way will be constructed to serve the campus.
- 15.7.1.5 URS Corporation prepared a Transport Assessment for the development in December 2009, that contained details of the anticipated traffic generated by the development. When complete, SUBC is predicted to generate a daily two-way flow of 7,491 vehicles. It has been assumed that in 2018 only Phase One will have been complete, and that SUBC will be operating at approximately 50% of its total capacity, equating to a daily two-way flow of 3,746 trips. The distribution of traffic on the local road network was also presented in the Transport Assessment. The proportion of trips on the part of the network under consideration in this assessment is shown in Table 15.29 below.

Table 15.29 Swansea University Bay Campus – trip distribution

Route	University & Employment Staff	Students
Fabian Way (West)	26%	60%
M4 North-west	20%	10%
A465 North-east	7%	5%
A48 East	10%	5%
M4 South-east	21%	10%
B4290 North	16%	10%
TOTAL	100%	100%

- 15.7.1.6 Traffic generated by SUBC has been distributed onto the local network in accordance with the above distribution, and is summarised in Table 15.34.

15.7.2 SA1 Development, Swansea

- 15.7.2.1 The SA1 site is located on 95 acres surrounding the Prince of Wales Dock. The development includes residential, business, commercial, hotel, education and marine facility uses.
- 15.7.2.2 A Transport Assessment for the development was prepared by Arup in 2002, and contains details of the anticipated car trip generation, including AM and PM peak hour flows. From this information an estimate of the daily traffic flow was made, based on the ratio of peak hour to daily flows for a mixed residential/business development obtained from the TRICS database. The peak hour and daily flows obtained in this way are shown in Table 15.30 below.

Table 15.30 SA1 Development - traffic flows

AM Peak		PM Peak		Daily
Arrivals	Departures	Arrivals	Departures	Two-way
1,881	980	914	1,588	22,332

15.7.2.3 Three access points to the development were proposed, all from Fabian Way. These are Kings Road (Junction 1), a new junction (now constructed) opposite Port Tennant Road (Junction 2), and Langdon Road, opposite the Park & Ride access (Junction 3).

15.7.2.4 The trip distribution assumed for the SA1 Development was based on a 60/40 west/east split, and the proportion of traffic using the three accesses was assumed to be as shown in Table 15.31.

Table 15.31 SA1 Development – trip distribution

Access	Proportion
Kings Road junction	32%
SA1/Port Tennant Road junction	44%
Park & Ride junction	24%
TOTAL	100%

15.7.2.5 The Transport Assessment assumed that the SA1 Development would be built out over a 20 year period. Construction is on-going and a number of developments have now been occupied. Based on this build rate, approximately 25% of the development would be completed in the five year period from 2013 to 2018. This percentage has been applied to the daily traffic flow presented in Table 15.17 to give a two-way daily flow of 5,583 vehicles. This daily flow has been distributed onto the local network in accordance with the trip distribution shown above, and is summarised in Table 15.34.

15.7.3 Coed Darcy Urban Village

15.7.3.1 Coed Darcy is a new urban village of 4,000 homes. It is being built on the site of the former BP oil refinery at Llandarcy. Development is progressing with approximately 100 units complete. The development is expected to provide 500,000 sq.ft. of new commercial space, a new district centre with community facilities, and other new living opportunities including retail, leisure, sports and open space. Three primary schools and one secondary school will also be built. The proposal includes a new southern link road connecting the site to Ffordd Amazon.

15.7.3.2 Ove Arup and Partners Ltd prepared a Transport Assessment for the development in March 2005 that contained details of the anticipated traffic that would be generated by the development, including the weekday peak hour traffic flows. From this information an estimate of the daily traffic flow was made, based on a ratio of peak hour to daily flows for residential development obtained from the TRICS database. The peak hour and daily flows obtained in this way are shown in Table 15.32 below.

Table 15.32 Coed Darcy Urban Village - traffic flows

AM Peak		PM Peak		Daily
Arrivals	Departures	Arrivals	Departures	Two-way
968	1,952	1,915	1,356	27,451

- 15.7.3.3 The distribution of traffic on the local road network was also presented in the Transport Assessment. The proportion of trips on the part of the network under consideration in this assessment is shown in Table 15.33.

Table 15.33 Coed Darcy Urban Village – trip distribution

Route	Proportion
Southern Link Road	15%
B4290	5%
M4 J42	4%
TOTAL	100%

- 15.7.3.4 Based on a build rate of approximately 150 units per year it has been assumed that approximately 750 units will be built and occupied between 2013 and 2018. This represents 19% of the total development of 4,000 homes, and this percentage has been applied to the daily traffic flow presented in Table 15.32 above to give a two-way daily flow of 5,147 vehicles. This daily flow has been distributed onto the local network in accordance with the trip distribution shown above, and is summarised in Table 15.34.

Swansea Boulevard Project

- 15.7.3.5 The Swansea Boulevard Project is aimed at improving the public realm between the River Tawe bridges and Princess Way, and improving links between the city centre and the waterfront. The project will create a tree lined corridor that will promote greater use of cycling and walking, and also promote public transport through the provision of bus lanes/gates. The scheme will also help to reduce congestion through the introduction of state-of-the-art traffic management systems. A substantial amount of work has already been completed on site, and the remaining two phases are due to be completed by the end of 2014.
- 15.7.3.6 Although the scheme is intended to reduce congestion it is not expected to have a significant effect on overall traffic flows and therefore has not been considered further.

15.7.4 Summary of cumulative scheme traffic

- 15.7.4.1 Impact on the local highway network of the cumulative schemes identified above is summarised in Table 15.34 below.

Table 15.34 Cumulative scheme daily traffic flows - summary

Location	SAIC	SA1	Coed Darcy	Total
Quay Parade	1,114	2,848	700	4,662
East Bank Way	197	502	123	822
King's Road	0	1,787	0	1,787
Fabian Way – east of East Bank Way	1,310	1,564	823	3,697
Fabian Way – west of Port Tennant junction	1,310	1,564	823	3,697
Fabian Way – east of Port Tennant junction	1,310	893	823	3,026
Fabian Way - west of P&R junction	1,310	893	823	3,026
Langdon Road	0	1,340	0	1,340
Fabian Way - east of P&R junction	1,310	2,233	823	4,366
Fabian Way - west of Baldwins Crescent	1,310	2,233	823	4,366
Fabian Way - east of Baldwins Crescent	1,310	2,233	823	4,366
Fabian Way – west of Elba Crescent	1,144	2,233	823	4,200
Fabian Way – east of Elba Crescent	2,436	2,233	823	5,492
Fabian Way – west of Ffordd Amazon	2,436	2,233	823	5,492
Ffordd Amazon	0	224	772	996
B4290	541	559	257	1,357
Fabian Way – west of Fford Amazon	1,892	1,451	206	3,549
A483 – west of A48 junction	1,230	781	0	2,011
A48 – north of A483 junction	852	224	0	1,076
A48 – south of A483 junction	379	559	0	938

- 15.7.4.2 In order to factor the traffic flows obtained from the 2013 baseline up to 2018 flows, TEMPRO v.6.2 growth factors have been used, adjusted for local growth using NTEM traffic growth calculations. Growth rates for principal urban roads in the Swansea authority area have been used, and the growth rates are presented in Table 15.35.

Table 15.35 Traffic Growth Rates

Period	Daily
2013 - 2018	1.0517

- 15.7.4.3 These growth factors have been applied to the 2013 baseline traffic flows to obtain flows for 2018, as shown in Table 15.36.
- 15.7.4.4 The impact of the traffic generated by the schemes considered in the cumulative impact assessment on the local highway network is presented in Table 15.36.

Table 15.36 Impact of cumulative scheme traffic

Location	2018 Base	Lagoon	Base + Lagoon	Cumul	Total	Increase
Quay Parade	48,645	27	48,672	4,662	53,334	9.6%
East Bank Way	22,128	5	22,133	822	22,955	3.7%
King's Road	4,917	0	4,917	1,787	6,704	36.3%
Fabian Way – east of East Bank Way	38,536	32	38,568	3,697	42,265	9.6%
Fabian Way – west of Port Tennant junction	35,347	32	35,379	3,697	39,076	10.4%
Fabian Way – east of Port Tennant junction	33,922	32	33,954	3,026	36,980	8.9%
Fabian Way - west of P&R junction	34,056	32	34,088	3,026	37,114	8.9%
Langdon Road	9,630	80	9,710	1,340	11,050	13.8%
Fabian Way - east of P&R junction	35,057	48	35,105	4,366	39,471	12.4%
Fabian Way - west of Baldwin's Crescent	33,957	48	34,005	4,366	38,371	12.8%
Fabian Way - east of Baldwin's Crescent	34,059	48	34,107	4,366	38,473	12.8%
Fabian Way – west of Elba Crescent	33,921	48	33,969	4,200	38,169	12.4%
Fabian Way – east of Elba Crescent	34,203	48	34,251	5,492	39,743	16.0%
Fabian Way – west of Ffordd Amazon	33,998	48	34,046	5,492	39,538	16.1%
Ffordd Amazon	1,081	4	1,085	996	2,081	91.8%
B4290	4,842	12	4,854	1,357	6,211	28.0%
Fabian Way – west of Fford Amazon	31,596	32	31,628	3,550	35,178	11.2%
A483 – west of A48 junction	15,678	16	15,694	2,011	17,705	12.8%
A48 – north of A483 junction	27,922	4	27,926	1,076	29,002	3.9%
A48 – south of A483 junction	27,547	12	27,559	938	28,497	3.4%

- 15.7.4.5 Traffic generated by the schemes considered in the cumulative impact assessment will result in an increase in total daily traffic flows on Fabian Way of up to 16%. Traffic on Kings Road is predicted to increase by 36%, as a result of the SA1 development traffic. Traffic flows on Ffordd Amazon will increase by 92%, mostly as a result of traffic generated by the Coed Darcy Urban Village development.
- 15.7.4.6 Cumulative scheme traffic is therefore expected to have a **moderate adverse** impact on the local highway network. The impact of development along Fabian Way was the subject of the Fabian Way Corridor Transport Assessment, and the proposed mitigation is summarised in Section 15.2.5.

15.8 Conclusions

- 15.8.0.1 An assessment of the potential impacts to onshore traffic and transport resulting from the Project has been undertaken. In addition, an assessment of the likely impact of the Project together with other schemes in the surrounding area has been carried out. The baseline environment was examined in relation to the surrounding highway network, public transport, cycling and pedestrian facilities within the vicinity of the Project. The assessment then considered the interaction between future development related movements and the baseline environment.
- 15.8.0.2 The Project is situated in the Port of Swansea. Fabian Way is an arterial road which forms part of the A483, connecting Swansea city centre with the M4 motorway at Junction 42. It is the main route into Swansea from the surrounding area and for traffic from further afield and runs adjacent to the Port. There are two junctions off Fabian Way providing access to the Port (the old Port access opposite the Park & Ride and Baldwin's Crescent). There is no public access to the Port of Swansea at present. Bus services operate along Fabian Way and the Project can be accessed from bus stops at two locations. There is a cycle path running along the southern side of Fabian Way forms a section of both National Cycle Network route 4 (NCN 4) and the Swansea to Glyncorrwg Loop. There is a Park & Ride facility located to the north of Fabian Way at the Langdon Road junction. The existing rail sidings to the north of Fabian Way are still in use, but the railway through the Port is not used and would require upgrading to become serviceable. For the purpose of the worst case assessment in this ES it has been assumed that all construction materials will be transported by sea or road.
- 15.8.0.3 The implementation of the Construction Phase Travel Plan including an access strategy for the Project will help to minimise the impact of construction on all modes of transport. HGV movements along Fabian Way will be managed to ensure that deliveries are timed to avoid the commuter peak periods as far as possible. The impact on the local highway network is predicted to be of minor adverse significance. The impact on public transport during the construction phase is expected to be negligible. Impacts on pedestrian and cyclist amenity will also be minimised through the Construction Phase Travel Plan, and the impact is considered to be negligible.
- 15.8.0.4 For the operational Project, impacts on the local highway network are expected to be negligible during normal day-to-day use and also during weekends and holiday periods. Implementation of the Major Events Travel Plan will minimise impacts on all modes of transport and will be planned well in advance of each sporting event, in consultation with CCSC, NPTCBC and other stakeholders. Through measures included in the Major Events Travel Plan and close liaison with all relevant bodies it is anticipated that impacts on the local highway network and public transport can be limited to minor adverse significance. The Project will include enhancements to pedestrian and cycle access to the port area, opening up an area previously inaccessible to the public, and will provide new links along the waterfront to the site of the SUBC resulting in a major beneficial impact. With or without the Project, traffic generated by cumulative developments will result in a moderate adverse impact on the local highway network.

15.9 References

Welsh Government (2012); 'Planning Policy Wales'

Welsh Government (2008); 'Technical Advice Note 18: Transport'.

Welsh Government (2008); 'One Wales: Connecting the Nation - The Wales Transport Strategy'.

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