LAND AT UPPER COSMESTON FARM, LAVERNOCK ROAD, PENARTH

ENVIRONMENTAL STATEMENT

VOLUME 2
CHAPTER 10: TRANSPORT

asbritransport

10.0 TRANSPORT

10.1 INTRODUCTION

10.1.1 This chapter of the environmental statement has been undertaken by Asbri Transport Limited and investigates the local transport systems serving the proposed development site, including the highway network, public transport infrastructure, and pedestrian/cycle facilities. This section also identifies the impact of the proposed development on the surrounding highway network.

10.1.2 A comprehensive Transport Assessment (TA) examines in detail the transport effects of the proposed development on the existing transport system and provides the basis for this report. The TA is included at **Appendix 10.1** of this Environment Statement (ES).

10.1.3 In addition, two Travel Plans (TP) for the residential and school developments respectively have been prepared which form separate documents accompanying the planning application.

10.1.4 The proposed development comprises a new residential development of up to 576 dwellings, public open space, community facilities as well as provision for an accompanying 2-form entry Primary School. The planning application site is located on 25.2 ha of Welsh Government owned land located along the southern fringes of Penarth, referred to as Upper Cosmeston Farm. The application site is allocated in the Vale of Glamorgan Local Development Plan as a Greenfield site for development.

10.2 ASSESSMENT METHODOLOGY

10.2.1 As stated earlier, the purpose of this chapter of the Environmental Statement is to; outline the development proposals, review the development proposals in relation to national and local planning policies; assess the impact of the proposed development on the surrounding transport network and identify any mitigation measures and residual impacts.

10.2.2 The scope of the Transport Assessment has been discussed and agreed with the Local Highway Authority as follows:-

Assessment Approach and Scenarios

Construction

10.2.3 The effects of the construction period have not been assessed to the same extent as the operational period as the traffic generation will be relatively minor compared to the operational period, with the increases in traffic well within both rules-of-thumb identified in the IEA Guidelines (see paragraph 3.15) these are discussed in more detail at paragraph 10.2.5.

Operation

10.2.4 The traffic impact assessment methodology is described fully in Section 6 and 7 of the TA. The assessment included scenarios both ‘without’ and ‘with’ the development proposals for an assessment year of 2022, 2025 and 2029 (when the development is expected to be complete). Both scenarios included future growth in traffic flows (based on growth factors obtained from TEMPro, an industry standard tool) and traffic associated with committed development.

Determining the Significance of Effect

10.2.5 The assessment has been based upon the Institute of Environmental Assessment's *Guidelines for the Environmental Assessment of Road Traffic* (the IEA Guidelines). The IEA Guidelines suggest in paragraph 3.15 that two broad rules-of-thumb could be used as a screening process to delimit the scale and extent of the assessment. These are:

"Rule 1 include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%).

Rule 2 include any other specifically sensitive areas where traffic flows have increased by 10% or more."

10.2.6 These rules-of-thumb form the starting point for the assessment of effects. Specifically sensitive areas under Rule 2 include accident black-spots, conservation areas, hospitals and links with high pedestrian flows.

10.2.7 The significance of the effects of the proposed development have been considered in respect of the following receptors based on the IEA Guidelines:

- Severance;
- Driver delay;
- Pedestrian delay;
- Pedestrian amenity;
- Fear and intimidation; and
- Accidents and safety.

10.2.8 For many receptors, the IEA Guidelines do not contain simple rules or formulae which define the thresholds of significance. Therefore, there is a need to exercise professional judgement in determining the degree of the effect and whether or not an improvement is required and, if required, what the improvement should comprise. The following tables have been developed in this manner.

Severance, Pedestrian Delay, Pedestrian Amenity, Fear and Intimidation

10.2.9 Receptors relating to severance, pedestrian delay, pedestrian amenity, and fear and intimidation are associated primarily with the pedestrian experience. The criteria for the sensitivity of these receptors and magnitude of change have been developed based on changes in the volume of traffic. An increase in traffic volumes can result in difficulties for pedestrians when crossing roads and affect the pleasantness of journeys. The criteria for assessment are set out in **Table 10.1**.

Sensitivity	**Criteria**
Very Low	Traffic flows of less than 100 PCUs per hour.
Low	Traffic flows of between 100 and less than 1,000 PCUs per hour.
Medium	Traffic flows of between 1,000 PCUs and less than 2,000 PCUs per hour.
High	Traffic flows of 2,000 PCUs and greater per hour.
Sensitivity	**Criteria**
Very Low	Change in traffic flows of between 1% and less than 30%.
Low	Change in traffic flows of between 30% and less than 60%.

Medium	Change in traffic flows of between 60% and less than 90%.
High	Change in traffic flows of 90% and greater.

Table 10.1 Receptor Sensitivity and Magnitude of Change Criteria –Severance, Pedestrian Delay, Pedestrian Amenity, Fear and Intimidation

10.2.10 The significance of effects for these receptors have also been assessed in qualitative terms in the context of existing pedestrian infrastructure, including the quality of footways, presence of street lighting and availability and type of crossing facilities.

Driver Delay

10.2.11 Changes in levels of delay at junctions have been used in the assessment of driver delay. This has focused on the total level of delay at existing junction locations (i.e. the total across all approach arms). Different criteria for sensitivity of receptor have been developed to account for the varying number of approach arms on the junctions in the study area network. The criteria for sensitivity of receptor and magnitude of change are set out in **Table 10.2**.

No. of Approach Arms	Sensitivity	Criteria
3	Very Low	Total junction delay of less than 30 seconds per PCU
	Low	Total junction delay of between 30 seconds and less than 90 seconds per PCU.
	Medium	Total junction delay of between 90 seconds and less than 180 seconds per PCU
	High	Total junction delay of 180 seconds and greater per PCU
4	Very Low	Total junction delay of less than 40 seconds per PCU.
	Low	Total junction delay of between 40 seconds and less than 120 seconds per PCU.
	Medium	Total junction delay of between 120 seconds and less than 240 seconds per PCU
	High	Total junction delay of 240 seconds and greater per PCU.
6	Very Low	Total junction delay of less than 60 seconds per PCU
	Low	Total junction delay of between 60 seconds and less than 180 seconds per PCU
	Medium	Total junction delay of between 180 seconds and less than 360 seconds per PCU
	High	Total junction delay of 360 seconds and greater per PCU.
No. of Approach Arms	**Sensitivity**	**Criteria**
3/4/6	Very Low	Change in junction delay per PCU of less than 30%.
	Low	Change in junction delay per PCU of between 30% and less than 60%.
	Medium	Change in junction delay per PCU of between 60% and less than 90%.
	High	Change in junction delay per PCU of 90% and greater

Table 10.2 Receptor Sensitivity and Magnitude of Change Criteria –Driver Delay

Accidents and Safety

10.2.12 The number of collisions on a road is an indicator of the current road safety conditions. An analysis of Personal Injury Collision (PIC) data has been undertaken over a five year period to identify whether there are any locations within the study area where there is an existing safety issue. Where an issue has been identified, a qualitative assessment has been undertaken to ascertain the likelihood that the proposed development will lead to further deterioration in safety.

10.2.13 A full data-set of collisions recorded in the study cordon has been secured in 2020 from Welsh Government and as such the highway safety analysis that follows has been based on the 2020 data-set. This confidential data-set has included details of all factors and variables associated with the collisions.

10.2.14 The study area for the collision data obtained from Welsh Government spans the length of the B4267 between the A4231/A4055/Sully Moors Road roundabout junction to the north west of the application site, to Llandough Hospital to the north of the application site.

10.2.15 The 2020 data-set includes collisions recorded during the period 2015 – 2019 and is understood to be the most current period for which data is attainable. It is considered that the data obtained for the year 2019 only includes the months of January – July, inclusively.

Year	Collision Severity			Casualties
	Fatal	Serious	Slight	
2015	0	5	4	10
2016	0	1	9	14
2017	0	1	9	18
2018	0	0	9	12
2019	0	0	2	3
Total	0	7	33	57

Table 10.3 Summary of Personal Injury Collision Data

10.2.16 It is evident from **Table 10.3** that there has been a total of 40 collisions within the five-year period studied of which, 7 collisions were classified as serious and 33 as slight. There has been a total of 57 casualties as a result of the 40 collisions.

10.2.17 It is noted that no fatal collisions were recorded in the data-set provided by Welsh Government.

10.2.18 Of collision data set analysed, 6 resulted in injuries to cyclists and 6 collisions involved injuries to pedestrians. As is evident from the collision plot included at Figure 3.6, these collisions are dispersed within the study area.

10.2.19 **Table 10.4** summarises the serious and slight collisions which involved NMUs reported within the study area.

Date & Time	Severity	Accident Reference	Description
06/03/2015 10:16AM	Serious	1500415	Elderly driver of V1 collided with pedestrian on zebra crossing.
24/05/2015 17:38PM	Serious	1500878	V1 has overtaken V2 on offside and turned left. V1 has struck V2 knocking rider off bicycle and onto floor causing injury.
13/07/2015 08:03AM	Serious	1501169	V1 collided with pedestrian who ran out into the road.
25/09/2015 17:13PM	Slight	1501679	V1 is a pedal cycle ridden by the injured person, (C1), 3/12/98. Whilst cycling downhill on Penlan Road, Llandough, intending to go to football training he lost control by travelling too fast and failed to negotiate the right hand bend.
11/04/2016 16:16PM	Serious	1600620	C1 has intentionally jumped in front of moving V1 (bus).
25/10/2016 08:27AM	Slight	1601750	C1 has crossed the road without looking and been struck by unknown V1. Driver stopped but C1 stated she was okay.
28/01/2017 19:52PM	Serious	1700179	V1 moved off when the lights changed at the crossroads when an intoxicated pedestrian jumped out in front of the vehicle and a collision occurred.
08/04/2017 15:07PM	Slight	1700582	V1 pedal cycle contravened red traffic light and travelled through the junction causing V2 to collide with it which was turning right.
19/09/2017 18:41PM	Slight	1701379	V1 turned right out of the golf club and collided with V2 pedal cycle.
14/07/2018 08:50AM	Slight	1801224	V2 a pedal cyclist has entered roundabout from Sully Moors Rd with intention of cycling around and back onto Sully Moors Rd when V1 approaching from south road and collided with cycle and has failed to stop.
23/08/2018 14:07PM	Slight	1801076	V1 pedal cycle was travelling along the pavement towards a t-junction. Whilst entering the road at the junction the rider was distracted by something on the opposite side of the road, could not brake in time and collided with the nearside of V2
06/12/2018 10:02PM	Slight	1900010	The driver of V1 stopped on the pavement. V1 then pulled forward and collided with two child pedestrians causing one to travel over the bonnet of the vehicle and the other making contact with the vehicle.

Table 10.4: NMU Collision details

10.2.20 Having reviewed the description provided in the data-set, 3 of the 5 serious collisions appeared to result from pedestrians entering the carriageway without due care, although

one of the collisions, 1600620 details that the pedestrian entered the path of a bus deliberately.

10.2.21 Collision 190010 involved a vehicle striking two child pedestrians resulting in the children sustaining slight injuries.

10.2.22 Of the 6 collisions involving cyclists 5 occurred at junctions, the sixth cyclist collision on Penlan Road resulted from the cyclist losing the control of the bicycle.

10.2.23 A review of the local accident data for the five year study period demonstrates that the surrounding area close to the proposed development does not experience any unusual accident patterns.

10.2.24 The majority of accidents were caused due to a driver's failure to pay proper attention. Most of the accidents were also concentrated on or around junctions which is to be expected due to the number of conflict points which occur as compared to link sections. As such, the analysis of accident records does not identify any significant patterns and does not give any cause of concern.

10.2.25 Based on the results of the collision data analysis it is considered that the development would not have a significant impact on the rate of collisions within the study area, over and above that which would be caused by an increase in traffic flows.

Interaction of Magnitude of Change and Sensitivity of Receptor

10.2.26 Effects on receptors can be beneficial, adverse or negligible, and of minor, moderate or major significance. The significance criteria are derived from the interaction of receptor sensitivity and magnitude of change of effect. A matrix of magnitude of change and sensitivity of receptor is set out in **Table 10.4**. Major and moderate effects are considered significant, and minor and negligible effects are considered not significant.

Magnitude of Change	Sensitivity of Receptor			
	Very Low	Low	Medium	High
Very low	Negligible	Negligible	Minor	Minor
Low	Negligible	Minor	Minor	Moderate
Medium	Minor	Minor	Moderate	Major
High	Minor	Moderate	Major	Major

Table 10.4 Assessment matrix

10.3 LEGISLATIVE AND PLANNING POLICY CONTEXT

10.3.1 This section identifies the legislation, policy and guidance of relevance to the assessment of the potential transport effects associated with the proposed development.

10.3.2 Legislation, policy and guidance have been considered on a national and local level. A comprehensive review has been undertaken as part of the TA. The assessment has been carried out with reference to these documents, which are listed in the following sub-sections.

National Planning Policy

The national (UK and Wales) policy and guidance that has been consulted is as follows:

- Wales Spatial Plan;
- National Development Framework 2020-2040;
- Active Travel Act 2013;
- Planning Policy Wales, Edition 10, Welsh Government (2018);
- One Wales: Connecting the Nation;
- Technical Advice Note 18: Transport, Welsh Government (2007); and,
- Well-being of Future Generations (Wales) Act 2015.

Local Planning Policy

- Vale of Glamorgan Council Local Development Plan;
- Vale of Glamorgan Local Development Plan 2011 – 2026: Supplementary Planning Guidance Travel Plans;
- Vale of Glamorgan Local Development Plan 2011 – 2026: Supplementary Planning Guidance Sustainable Development; and,
- Penarth/Cardiff Barrage Sustainable Transport Study.

10.4 BASELINE CONDITIONS

Site Location

10.4.1 The proposed development site is located to the south of Penarth and to the immediate east of Lavernock Road. The site is bounded by residential housing estates to the north, the Wales Coastal Path and beyond that the Bristol Channel to the east, farm land to the south and Lavernock Road and Cosmeston Country Park beyond this to the west.

10.4.2 Penarth town centre is located approximately 2.5km to the north of the proposed site and the settlement of Sully is located approximately 2km to the south-west of the application site.

Pedestrians

10.4.4 Footway provision within the vicinity of the development site is of a reasonable standard with provision on the eastern side of Lavernock Road only adjacent to the application site's frontage.

10.4.5 The majority of roads to the north of the proposed development have footway provision on one or both sides of the carriageway with a number of formal and informal crossing facilities across Lavernock Road and its side roads. A controlled Toucan or Pegasus crossing for pedestrians, cyclists and potentially horse riders is to be located approximately 300m to the north of the proposed site access providing a safe crossing point to the north-bound bus stop and Cosmeston Lakes.

10.4.6 A dedicated pedestrian/cycleway runs along the western boundary of the site and this is signed accordingly.

10.4.7 There is a shared active travel pedestrian/cycle way present along the eastern carriageway off Lavernock Road, providing access into central Penarth to the north.

10.4.8 It is noted that there is currently no footway provision present along the western side of the carriageway of Lavernock Road in proximity to the site.

10.4.9 In addition to the above, a shared pedestrian/cycle National Cycle Network (NCN) Route 88 path runs directly to the north of the application site and follows the old railway line into Penarth Town Centre.

10.4.10 The route is in excellent condition and the path itself varies in width from 2.1m – 3m along its length with the total width of the old cutting being circa 6m. There is a pinch point is its northern end, where the link narrows to circa 1.8m as it passes behind the gardens of houses fronting Plymouth Drive and ultimately joins the footway along the western side of Plymouth Drive.

10.4.11 The Chartered Institution of Highways and Transportation (CIHT) guidelines 'Providing for Journeys on Foot' suggest that the desirable walking distance for 'commuting/school' walking trips is 500 metres, the acceptable distance is 1km, and 2km is the preferred maximum. The desirable walking distance for 'Elsewhere' (this includes access to local amenities) is 400m, the acceptable distance is 800m and 1.2km is the preferred maximum.

10.4.12 Local amenities/facilities that are within the walking distances are set out in **Table 10.5** below.

Amenity/Facility	Distance
Harvester Restaurant	650 m
Glamorganshire Golf Club	800 m
Sully sports & social club	2 km
St Aubin Nurseries	2.1km
Evenlode Primary School	2.1 km
Sully library	2.25 km
Sully Post Office	2.5 km
Stanwell School	2.5 km
Penarth Railway Station	2.5 km
Westbourne School	2.6 km
Tesco Express	2.7 km
Penarth Library	2.7 km
Penarth town centre	2.8 km
Sully Surgery	3 km

Table 10.5: Walking distance to local amenities from the site

10.4.13 Table 10.5 indicates that the site is well located in terms of proximity and accessibility by foot or bicycle to a number of local facilities and public transport opportunities. The distances referenced in Table 3.1 are measured from the site frontage.

10.4.14 Additionally, the Welsh Coastal path (part of which forms a public right of way footpath) runs along the coast to the east of the site, providing pedestrians with a segregated walking route from road traffic.

10.4.15 Those who wish for a more tranquil and scenic route to Penarth and beyond to the north may opt to take this route.

Cyclists

10.4.16 Cycling as a mode of travel is ever increasing given the growing trend of recreational cycling and is seen as a key travel mode for mode shift away from the car.

10.4.17 As set out previously, National Cycle Network (NCN) Route 88 runs directly to the north of the application site and follows the old railway line into Penarth Town Centre, from there it links to NCN Route 8 which provides access into Cardiff City Centre.

10.4.18 NCN Route 88 is a proposed coastal route between Newport, Cardiff, Bridgend and Margam Country Park. At the moment, only short sections of the route are open.

10.4.19 Active Travel routes are proposed within the Vale of Glamorgan's LDP and part of these proposals include the extension of NCN Route 88 to trail south through the middle of the proposed development. This would provide an excellent level of off-road cycle and pedestrian connectivity from the development site into the centre of Penarth.

10.4.20 The alignment and design for the proposed Active Travel Routes will be discussed and agreed with officers of the Highway Authority.

Public Transport

Bus

10.4.21 Bus services within the vicinity of the site are of a good standard in terms of route destinations and service frequencies, providing access throughout Penarth and destinations across the wider bus network such as Barry and Cardiff.

10.4.22 The closest bus stops to the site are located along Lavernock Road approximately 220m to the north of the proposed development site's northern boundary. The walk distance to the stops increases progressively the further south and east into the Masterplan area.

10.4.23 There are scheduled bus services calling at stops to the north and south of the proposed site access along Lavernock Road. The bus services calling at stops within the vicinity of the proposed development are shown in **Table 10.6**.

Route No.	Route	Frequency
88	Penarth – Barry	Mon-Fri, hourly services between 07:33-14:33
	Barry – Penarth	Mon-Fri, hourly services between 07:19-15:19
94	Cardiff – Penarth – Sully - Barry	Mon-Fri, services half hourly to hourly from 06:45-22:24. Sat, 07:52-22:24, half hourly – hourly Sun, 07:52, then hourly from 09:24-21:24
	Barry – Sully - Penarth - Cardiff	Mon-Fri, services half hourly to hourly from 06:23-21:30. Sat & Sun, 06:59-21:30 half hourly – hourly
S51	Llandough – St Richard Gwyn High School	Mon-Fri, service at 08:31 (school days only)
	St Richard Gwyn High School – Llandough	Mon-Fri, service at 15:37 (school days only)
SC1	Barry – Penarth	Mon-Fri, service at 07:57 (school days only)
	Penarth – Barry	Mon- Fri, service at 14:50

Table 10.6: Summary of bus services operating in the vicinity of the site

10.4.24 As indicated in Table 10.6, the bus services operating within the vicinity of the site provide a good level of service and frequency with a number of bus services operating per hour within close walking distance of the proposed development site, enabling future occupants of the site to access 0900-1700 employment within Penarth, Cardiff or Barry.

10.4.25 This is accentuated by the fact that service 94 provides direct access to Penarth Railway station and opportunities to travel further afield than those identified above.

Rail

10.4.26 Penarth Railway Station is the nearest rail station to the site and is located roughly 2.5km to the north of the proposed site access.

10.4.27 The station is served by Transport for Wales, operating local services along the Vale of Glamorgan Line to destinations such as Cardiff Central, Bargoed and Rhymney. Approximately four trains per hour run to Cardiff Central on weekdays and Saturdays. Evening services run twice hourly and Sundays see one train every two hours (a total of 6 a day). The journey time to Cardiff Central averages 13 minutes.

10.4.28 As set out above, the station is served by bus service 94, providing direct access from Cosmeston to Penarth Railway station.

10.4.29 In addition, a direct pedestrian and cycling link is provided from the heart of the housing stock within Cosmeston, running directly from the north of the application site along the old railway line to the rear of Penarth train station.

South Wales Metro

10.4.30 It is proposed that by 2023, the South Wales Metro (SWM) will provide an improved and innovative rail network throughout the core valley lines from Cardiff City Centre to Penarth. It is proposed that 4 trains per hour will be in operation between Penarth and Cardiff with possible tram-trains enabling a further extension of the metro into Lower Penarth.

10.4.31 These proposals would increase the attractiveness and accessibility of public transport in the vicinity of the proposed development. A metro stop located in Lower Penarth would reduce the distance needed to travel to the existing railway station in Central Penarth.

Highway network

10.4.32 The following section of the report describes the highway network in the vicinity of the site.

10.4.33 The highway network in the vicinity of the site is dominated by Lavernock Road.

Lavernock Road

10.4.34 Lavernock Road, classified as the B4267, is a single two-way carriageway distributor road that links Cosmeston to Lower Penarth and Sully.

10.4.35 Adjacent to the site, Lavernock Road is approximately 8.5m wide, with footway and adjacent highway verge of varying widths in the range of 2.5m to 3.5m along the eastern side of the carriageway only. There is highway verge on the western side of the road but there is no footway provision.

10.4.36 In the vicinity of the site's southern frontage to Lavernock Road, the road is unlit and is subject to a 40mph speed limit. To the north of the site's frontage the speed limit reduces to 30mph and street lighting is present. Top the north of the application site the road is fronted predominantly by residential dwellings and some commercial premises such as public houses.

10.4.37 To the north of the site's northern boundary an active travel route for pedestrians and cyclists can be found. The route is hard surfaced and signed facilitating movements to Penarth.

10.4.38 There is a signal-controlled pedestrian and cyclist crossing facility present in the vicinity of the access junction to Cosmeston Lakes where there are bus stops providing access to services operating in both directions.

Baseline Traffic Flows

10.4.39 In order to obtain the most recent traffic flows on the local highway network, classified junction turning counts were undertaken on Thursday 29th November 2018 during school term-time at the following junctions:

1. A4231/A4055/Sully Moors Road roundabout junction
2. Sully Moors Road/B4267/Hayes Road roundabout junction
3. Lavernock Road/Cosmeston Lake Country Park priority junction
4. Lavernock Road/Cosmeston Drive priority junction
5. Lavernock Road/Westbourne Road priority junction
6. B4267/Augusta Road/Lavernock Road/Castle Avenue crossroads
7. Lavernock Road/Dinas Road/Victoria Road crossroads
8. Cardiff Road/B4267/A4055 signalised junction
9. A4055/B4267/Andre Road signalised crossroads
10. A4055/A4160 signalised intersection

10.4.40 From the surveys, the weekday peak periods have been determined as 0745-0845 and 1630-1730.

Road Safety

10.4.41 PIC data has been obtained from Welsh Government for the most recent five-year period available for the study area. A total of 40 PICs were recorded in the five-year period, of which 7 collisions were classified as 'serious' and 33 were classified as 'slight'. No fatalities have occurred within the study area within the timeframe investigated.

10.4.42 Analysis undertaken as part of the TA found that overall, the PIC data has not identified any existing highway safety issues that require more detailed examination or that could be exacerbated by the proposed development.

10.5 ASSESSMENT OF POTENTIAL IMPACTS

Construction Traffic

10.5.1 It is considered that construction traffic will have an impact on the operation of the highway network within the study area, potentially increasing queues and delays during network peak periods. However, traffic generated during the construction stage will only have a moderate, short term, negative impact.

Operation

Trip Generation

10.5.2 In order to analyse the impact of the development proposals on the existing transport infrastructure, it is necessary to assess the likely volume of vehicles accessing the site. This section outlines the methodology used to predict the future traffic generation and provides an estimate of future trips to/from the development site.

10.5.3 The assessment of the proposed development is based on traffic generation levels derived from a trip generation rates derived from the industry standard database Trip Rate Information Computer System (TRICS). This is discussed in detail in Sections 6 to 8 of the TA.

10.5.4 The forecast traffic of the proposed development, in vehicle numbers, is set out in **Table 10.7**.

Peak period	Development component	Arrive	Depart	Total
2022 – 50 dwellings				
AM	Residential	6	17	24
	Primary School	0	0	0
	Total	**6**	**17**	**24**
PM	Residential	15	7	23
	Primary School	0	0	0
	Total	**15**	**7**	**23**
2025 – 234 dwellings + primary school				
AM	Residential	30	81	111
	Primary School	107	72	179
	Total	**137**	**153**	**290**
PM	Residential	71	35	106
	Primary School	7	15	22
	Total	**78**	**50**	**126**
2029 – 518 dwellings + primary school				
AM	Residential	67	179	246
	Primary School	107	72	179
	Total	**174**	**251**	**425**
PM	Residential	158	77	236
	Primary School	7	15	22
	Total	**165**	**92**	**258**

Table 10.7: Vehicle trip generation – Mixed private/affordable dwellings

10.5.5 The development traffic has been assigned to the local highway network from the origin/destination information contained within the 2011 census data for The Vale of Glamorgan 008F lower layer super output area as detailed in the TA.

10.5.6 The development flows and future year flows are detailed within the TA.

Traffic Generation

10.5.7 It is anticipated that the proposed development will generate 425 vehicles (two-way) in the AM peak and up to 258 vehicles (two-way) in the PM peak in 2029, potentially contributing to noise and air quality pollution locally.

10.5.8 It is anticipated that this volume of traffic will contribute to noise and air quality pollution locally, and the impact is therefore considered to have a minor adverse significance rating.

Severance, Pedestrian Delay, Pedestrian Amenity, Fear and Intimidation –Traffic Flows

10.5.9 The assessment of severance, pedestrian delay, pedestrian amenity, and fear and intimidation has been based on changes in traffic flows on the junctions in the study area network.

10.5.10 **Tables 10.8** and **10.9** show the two-way total link flows during the weekday AM and PM peak hours respectively for the surrounding highway network in 2029 both 'without' and 'with' the proposed development, the difference between the two and the percentage change. For each link, the significance of effect has been determined with reference to the magnitude of change and sensitivity of the link.

Junction	Total junction flow		% impact	Magnitude of change	Sensitivity	Significance of effect
	Base	Dev				
2022						
A4231/A4055/Sully Moors Road	3561	4	0%	Very low	Very low	Negligible
Sully Moors Road/B4267/Hayes Road	2083	4	0%	Very low	Very low	Negligible
Lavernock Road/Cosmeston Lake Country	1471	19	1%	Very low	Very low	Negligible
Lavernock Road/Cosmeston Drive	1571	19	1%	Very low	Very low	Negligible
Lavernock Road/Westbourne Road	1615	20	1%	Very low	Very low	Negligible
B4267/Augusta Road/Lavernock Rd/Castle Av	967	15	2%	Very low	Very low	Negligible
Lavernock Road/Dinas Road/Victoria Road	1225	16	1%	Very low	Very low	Negligible
Cardiff Road/B4267/A4055	2641	14	1%	Very low	Very low	Negligible
A4055/B4267/Andrew Road	2629	13	1%	Very low	Very low	Negligible
A4055/A4160	4070	12	0%	Very low	Very low	Negligible
2025						
A4231/A4055/Sully Moors Road	3643	20	1%	Very low	Very low	Negligible
Sully Moors Road/B4267/Hayes Road	2130	20	1%	Very low	Very low	Negligible
Lavernock Road/Cosmeston Lake Country	1506	238	16%	Very low	Low	Negligible
Lavernock Road/Cosmeston Drive	1608	238	15%	Very low	Low	Negligible
Lavernock Road/Westbourne Road	1653	238	14%	Very low	Low	Negligible
B4267/Augusta Road/Lavernock Rd/Castle Av	990	188	20%	Very low	Low	Negligible
Lavernock Road/Dinas Road/Victoria Road	1254	129	10%	Very low	Low	Negligible
Cardiff Road/B4267/A4055	2701	63	2%	Very low	Very low	Negligible
A4055/B4267/Andrew Road	2689	57	2%	Very low	Very low	Negligible
A4055/A4160	4166	55	1%	Very low	Very low	Negligible
2029						
A4231/A4055/Sully Moors Road	3733	44	1%	Very low	Very low	Negligible
Sully Moors Road/B4267/Hayes Road	2180	44	2%	Very low	Very low	Negligible
Lavernock Road/Cosmeston Lake Country	1543	349	23%	Very low	Low	Negligible
Lavernock Road/Cosmeston Drive	1648	349	21%	Very low	Low	Negligible
Lavernock Road/Westbourne Road	1694	349	21%	Very low	Low	Negligible
B4267/Augusta Road/Lavernock Rd/Castle Av	1015	255	25%	Very low	Low	Negligible
Lavernock Road/Dinas Road/Victoria Road	1286	214	17%	Very low	Low	Negligible
Cardiff Road/B4267/A4055	2767	140	5%	Very low	Low	Negligible
A4055/B4267/Andrew Road	2755	140	5%	Very low	Low	Negligible
A4055/A4160	4270	122	3%	Very low	Low	Negligible

Table 10.8: Percentage Impact Analysis - AM

Junction	Total junction flow		% impact	Magnitude of change	Sensitivity	Significance of effect
	Base	Dev				
2022						
A4231/A4055/Sully Moors Road	3240	5	0%	Very low	Very low	Negligible
Sully Moors Road/B4267/Hayes Road	1687	5	0%	Very low	Very low	Negligible
Lavernock Road/Cosmeston Lake Country	1256	19	2%	Very low	Very low	Negligible
Lavernock Road/Cosmeston Drive	1374	19	1%	Very low	Very low	Negligible
Lavernock Road/Westbourne Road	1373	19	1%	Very low	Very low	Negligible
B4267/Augusta Road/Lavernock Rd/Castle Av	928	14	2%	Very low	Very low	Negligible
Lavernock Road/Dinas Road/Victoria Road	1184	14	1%	Very low	Very low	Negligible
Cardiff Road/B4267/A4055	2710	13	0%	Very low	Very low	Negligible
A4055/B4267/Andrew Road	2763	14	0%	Very low	Very low	Negligible
A4055/A4160	4187	11	0%	Very low	Very low	Negligible
2025						
A4231/A4055/Sully Moors Road	3319	19	1%	Very low	Very low	Negligible
Sully Moors Road/B4267/Hayes Road	1726	19	1%	Very low	Very low	Negligible
Lavernock Road/Cosmeston Lake Country	1287	106	8%	Very low	Very low	Negligible
Lavernock Road/Cosmeston Drive	1408	106	7%	Very low	Very low	Negligible
Lavernock Road/Westbourne Road	1406	105	7%	Very low	Very low	Negligible
B4267/Augusta Road/Lavernock Rd/Castle Av	952	81	9%	Very low	Very low	Negligible
Lavernock Road/Dinas Road/Victoria Road	1214	74	6%	Very low	Very low	Negligible
Cardiff Road/B4267/A4055	2775	60	2%	Very low	Very low	Negligible
A4055/B4267/Andrew Road	2830	60	2%	Very low	Very low	Negligible
A4055/A4160	4291	53	1%	Very low	Very low	Negligible
2029						
A4231/A4055/Sully Moors Road	3405	42	1%	Very low	Very low	Negligible
Sully Moors Road/B4267/Hayes Road	1767	42	2%	Very low	Very low	Negligible
Lavernock Road/Cosmeston Lake Country	1320	212	16%	Very low	Low	Negligible
Lavernock Road/Cosmeston Drive	1444	212	15%	Very low	Low	Negligible
Lavernock Road/Westbourne Road	1443	212	15%	Very low	Low	Negligible
B4267/Augusta Road/Lavernock Rd/Castle Av	977	163	17%	Very low	Low	Negligible
Lavernock Road/Dinas Road/Victoria Road	1246	156	13%	Very low	Low	Negligible
Cardiff Road/B4267/A4055	2845	134	5%	Very low	Low	Negligible
A4055/B4267/Andrew Road	2902	134	5%	Very low	Low	Negligible
A4055/A4160	4402	117	3%	Very low	Low	Negligible

Table 10.9: Percentage Impact Analysis - PM

10.5.11 **Table 10.8** and **10.9** shows that, in terms of total traffic flows, all links will experience a magnitude of change and sensitivity of low or very low and witness a negligible effect during both the AM and PM peak hour.

Driver Delay

10.5.12 The assessment of driver delay has been based on the capacity assessment undertaken in Section 7 of the TA for the following existing junctions in the study area:

10.5.13 **Tables 10.10** and **10.11** show the total junction delay at the assessment junctions during the weekday AM and PM peak hours respectively in 2022, 2025 and 2029 both 'with' and 'without' development, the difference between the two and the percentage change. For each junction, the significance of effect has been determined with reference to the magnitude of change and sensitivity of the junction.

Junction	No dev	With dev	Difference	% impact	Magnitude of change	Sensitivity	Significance of effect
2022							
Lavernock Rd/Cosmeston Drive	7.19	7.34	0.15	2%	Very low	Very low	Negligible
Lavernock Rd/Westbourne Rd	309.77	323.57	13.8	4%	Very low	High	Minor
B4267/Augusta Rd/Lavernock Rd/Castle Av	2.69	2.68	-0.01	0%	Very low	Very low	Negligible
Lavernock Rd/Dinas Rd/Victoria Rd	71.25	72.75	1.5	2%	Very low	Low	Negligible
2025							
Lavernock Rd/Cosmeston Drive	7.61	10.54	2.93	39%	low	Very low	Negligible
Lavernock Rd/Westbourne Rd	359.66	833.37	473.71	132%	High	High	Major
B4267/Augusta Rd/Lavernock Rd/Castle Av	2.76	3.42	0.66	24%	Very low	Very low	Negligible
Lavernock Rd/Dinas Rd/Victoria Rd	74	96.075	22.08	30%	Very Low	Low	Negligible
2029							
Lavernock Rd/Cosmeston Drive	8.16	15.98	7.82	96%	High	Very low	Minor
Lavernock Rd/Westbourne Rd	418.4	9563930	9563511	-	High	High	Major
B4267/Augusta Rd/Lavernock Rd/Castle Av	2.83	3.63	0.8	28%	Very low	Very low	Negligible
Lavernock Rd/Dinas Rd/Victoria Rd	77.55	142.475	64.93	84%	Medium	Low	Minor

Table 10.10: Total Junction Delay (Seconds per PCU) –Weekday AM Peak Hour

10.5.14 **Tables 10.10** shows that the junctions the Lavernock Rd/Westbourne Rd junction will experience a **Major adverse** effect during the 2025 and 2029 AM peak hour. This has been identified as a congestion hotspot within the analysis with discussions to be held with the local highway authority to identify potential mitigation measures including the introduction of traffic management measures. The remaining junctions will experience a **Negligible to minor adverse** effect during the 2022 and 2025 AM peak hour. However, during the 2029 AM peak period Lavernock Rd/Cosmeston Drive, Lavernock Rd/Westbourne Rd and Lavernock Rd/Dinas Rd/Victoria Rd junctions will experience a **Minor adverse** effect. The B4267/Augusta Rd/Lavernock Rd/Castle Av junction will witness a **Negligible adverse** effect

Junction	No dev	With dev	Difference	% impact	Magnitude of change	Sensitivity	Significance of effect
2022							
Lavernock Rd/Cosmeston Drive	2.6	2.62	0.02	1%	Very low	Very low	Negligible
Lavernock Rd/Westbourne Rd	33.52	35.51	1.99	6%	Very low	Low	Negligible
B4267/Augusta Rd/Lavernock Rd/Castle Av	2.17	2.11	-0.06	-3%	Very low	Very low	Negligible
Lavernock Rd/Dinas Rd/Victoria Rd	70.325	71.55	1.225	2%	Very low	Low	Negligible
2025							
Lavernock Rd/Cosmeston Drive	2.65	2.95	0.3	11%	Very low	Very low	Negligible
Lavernock Rd/Westbourne Rd	40.68	55.18	14.5	36%	Low	Low	Minor
B4267/Augusta Rd/Lavernock Rd/Castle Av	2.16	2.15	-0.01	0%	Very low	Very low	Negligible
Lavernock Rd/Dinas Rd/Victoria Rd	72.725	79.825	7.1	10%	Very low	Low	Negligible
2029							
Lavernock Rd/Cosmeston Drive	2.7	3.12	0.42	16%	Very low	Very low	Negligible
Lavernock Rd/Westbourne Rd	49.68	277	227.32	458%	High	Low	Moderate
B4267/Augusta Rd/Lavernock Rd/Castle Av	2.21	2.16	-0.05	-2%	Very low	Very low	Negligible
Lavernock Rd/Dinas Rd/Victoria Rd	75.725	102.825	27.1	36%	Low	Low	Minor

Table 10.11: Total Junction Delay (Seconds per PCU) –Weekday PM Peak Hour

10.5.15 **Table 10.10** shows that the Lavernock Rd/Westbourne Rd junction will experience a **Moderate adverse** effect during the 2029 PM peak hour. The remaining junctions will witness a **Negligible to minor adverse** effect during the 2022, 2025 and 2029 PM peak hour.

Accidents and Safety

10.5.16 As previously discussed, the TA found that overall, the PIC data has not identified any existing highway safety issues that require more detailed examination or that could be exacerbated by the proposed development.

Pedestrian Accessibility

10.5.17 In order to encourage travelling on foot to, from and within the development, scheme proposals include:

- A Toucan or Pegasus crossing to be located between the two proposed access points and footway provision on the western side of Lavernock Road to all ow access to Cosmeston Lakes and the north-bound bus stop.
- The continuation of an existing active travel route (NCN88) on a north-south axis through the development site;
- A number of access points to the existing coastal path that runs along the eastern boundary of the site will provided
- The provision of new bus stop infrastructure to current accessibility standards;

10.5.18 Walking and cycling will be promoted by effective implementation of the Travel Plan as a primary mode of transport for the residents of the new development. This will be facilitated by providing the necessary pedestrian and cycling infrastructure within the site to promote and encourage residents to walk and cycle by creating a network of interconnecting public open spaces throughout the site. A Travel Plan for both land uses accompanies the planning submission.

10.6 MITIGATION

Construction Traffic

10.6.1 It is anticipated that a Construction Environmental Management Plan (CEMP) will be required. This document will indicate *inter alia* the construction phasing, hours of operation, the level of vehicle activities, and measures undertaken to prevent the spread of waste materials onto the highway. Submission of this document offers the opportunity for the impact on construction traffic on the surrounding highway network to be minimised.

10.6.2 The CEMP will control the impact of construction traffic on the surrounding highway network, and it is therefore anticipated that the residual impact will be minor adverse.

Operation

10.6.3 In the interests of sustainability and to ensure the proposed development is planning policy compliant, measures to encourage walking, cycling and public transport and to mitigate the additional travel demand as well as generally improving the surrounding transport infrastructure are proposed as part of the TA. These measures are summarised as follows:

- The impact of the proposed connection to NCN 88 as well as the links to the coastal footpath will have an impact on the hedgerows and local fauna. However, in order to minimise any impact hedging will be replaced/translocated elsewhere within the site. It is anticipated that the residual impact will be minor adverse.

- The two main points of vehicular access to the site will also incorporate facilities for pedestrians and cyclist. A signal-controlled toucan crossing for both pedestrians and cyclists is proposed at the site's frontage to provide direct and safe access to Cosmeston Lakes. The crossing will also allow access to the north-bound bus services.

- New bus stops are also proposed for services operating in both directions.

- The site is ideally located with regard to existing pedestrian/cycle links along Lavernock Road, Railway Walk and the coastal footpath, providing excellent active travel links to the wider area.

- The development will provide the necessary pedestrian and cyclist infrastructure within the site to encourage residents to walk and cycle, with 2m wide footways included on one or both sides of the carriageway across the site. Where appropriate, shared use private drives will also be included, prioritising the needs of pedestrians and cyclists over that of vehicles.

- Walking and cycling will be promoted by effective implementation of the Travel Plan as a primary mode of transport for the residents of the new development. This will be facilitated by providing the necessary pedestrian and cycling infrastructure within the site

to promote and encourage residents to walk and cycle by creating a network of interconnecting public open spaces throughout the site.

- Further enhancements include the extension of the existing NCN88 route through the site providing a direct active travel corridor from the site to Penarth Town Centre.

- It is proposed to provide footway on the western side of Lavernock Road, measuring approximately 2m in width, which will allow for those travelling on foot safe passage to and from the site and to allow greater ease of access to the northbound bus services and local amenities.

10.6.4 In addition to the above, in order to reduce the impact of traffic generated by the development, it is proposed to implement a site-wide Travel Plan, which will seek to reduce the number of Single Occupancy Vehicle use and promote the use of more sustainable modes of transport including: -

- Walking
- Cycling
- Public Transport; and
- Car sharing

10.6.5 The Travel Plan will reduce the volume of single occupancy vehicles and encourage the use of more sustainable transport modes, and it is therefore anticipated that the residual impact will be minor adverse.

10.6.6 The proposed mitigation measures have been discussed in respect of the subject areas and associated effects that have been identified as set out in the following sections.

Severance, Pedestrian Delay, Pedestrian Amenity, and Fear and Intimidation

10.6.7 In respect of severance, pedestrian delay, pedestrian amenity, and fear and intimidation it has been identified that, without mitigation, Links 2, 3, 11, 12, 14, 16, 17 and 18 will experience a minor adverse effect. These links are all street lit and have footways (of minimal width 2m) on one/both sides of the carriageway. There are existing/proposed crossing facilities (both uncontrolled and controlled) to accommodate key pedestrian desire lines. In view of this, mitigation measures are not considered to be required at these locations.

10.6.8 Notwithstanding, it is proposed to implement various pedestrian improvements to the local area as described in the previous section of this Chapter.

Driver Delay

10.6.9 It has been identified that, without mitigation, the effect of the proposed development on the Lavernock Rd/Dinas Rd/Victoria Rd signalised junction will be negligible adverse. The TA has identified the opportunity to improve the performance of the junction through changes to the signal operation (see details in the TA). **Table 10.12** shows the driver delay at the Lavernock Rd/Dinas Rd/Victoria Rd signalised junction during the weekday AM and PM peak hours in 2022, 2025 and 2029 both 'without' (existing signal operation) and 'with' the proposed development (with modifications to signal operation).

Junction	No dev	With dev	Difference	% impact	Magnitude of change	Sensitivity	Significance of effect
2029							
AM peak	77.55	31.2	-46.35	-60%	Low	Low	Minor
PM peak	75.73	31.68	-44.05	-58%	Low	Low	Minor

Table 10.12: Total Junction Delay (PCU/hour) – Lavernock Rd/Dinas Rd/Victoria Rd signalised Junction –With Modifications to Signal Operation

10.6.10 **Table 10.12** shows that the proposed development (with mitigation) will have a **Minor Beneficial** effect during both the AM and PM peak hour.

Accidents and Safety

10.6.11 As previously discussed, the TA found that overall, the PIC data has not identified any existing highway safety issues that require more detailed examination or that could be exacerbated by the proposed development.

10.7 RESIDUAL IMPACTS

Residual Effects

10.7.1 Following consideration of the potential impacts of the development on traffic, transport and movement interests during the construction and operation phases, and also the implementation of described mitigation measures, the residual impact of the scheme is summarised in **Table 10.13** below.

10.7.2 Overall, it is considered that with the introduction of the proposed mitigation measures, the impacts will be reduced at both construction and operational phases. No major adverse impacts will remain and it is therefore considered that the proposed development will not represent a significant effect on the environment from a traffic, transport and movement standpoint.

Table 10.13: Summary of Residual Effects of the Proposed Development

	Description of Impact		Description of Mitigation Measures	Significance of Residual Impact
	Description	Significance		
Construction traffic	It is considered that construction traffic will have an impact on the operation of the highway network within the study area, potentially increasing queues and delays during network peak periods.	Minor adverse	A Construction Environment Management Plan will be produced to reduce the impact of the construction phase(s) of the development proposals.	Minor adverse
Severance, Pedestrian Delay, Pedestrian Amenity, Fear and Intimidation Traffic generation	In terms of total traffic flows, all links will experience a magnitude of change and sensitivity of low or very low and witness a negligible effect during both the AM and PM peak hour. It is estimated that the proposed development could generate up to 425 vehicles (two-way) in the am peak and 254 (two-way) in the pm peak. This volume of traffic will contribution to noise and air quality pollution locally.	Negligible adverse	Implement a Travel Plan that will reduce the volume of single occupancy vehicles and encourage the use of more sustainable transport modes. The site will always generate vehicle movements, which will have an adverse impact on noise and air quality levels locally	Negligible adverse

Driver Delay	The existing Lavernock Road/Dinas Road/Victoria Road signalised junction operates above its maximum theoretical capacity, in the 2029 with development scenario and the proposed development will add to queues and delays at this junction. It is anticipated that traffic generated by the proposed development will contribute to queues and delays at existing junctions within the study area.	Negligible adverse Minor adverse	The existing four-stage traffic sequence could be replaced with a more efficient two-stage sequence that would incorporate right-turning traffic operating under priority control in the middle of the junction. Queues and delays at the modified junction will be within acceptable limits. Possible improvements to staging at Lavernock Road/Dinas Road/Victoria Road	Negligible adverse Minor adverse

10.8 CONCLUSION

10.8.1 This Chapter of the ES identifies the impact of the proposed development on the surrounding transport network; and identifies any measures required to mitigate the impact of the proposed development.

10.8.2 As part of the re-development of the site, it is proposed to provide up to 576 dwellings, Public Open Space, community facilities as well as provision for an accompanying 2-form entry Primary School.

10.8.3 In order to access the development, it is proposed to provide vehicular access via two ghost-island priority junctions along the western boundary of the site with Lavernock Road.

10.8.4 As agreed with the local highway authority, the vehicle trip generation rates for the committed developments (Cog Road) have been taken into account and proposed development (576 residential dwellings and a Primary School) have been obtained from the TRICS trip generation database.

10.8.5 The results of the junction modelling show that, with the exception of the Westbourne Road junction, that there are no major issues on capacity identified on the majority of the junctions and that the local highway network can generally accommodate a residential development comprising 576 dwellings and a primary school.

10.8.6 Overall, it is considered that with the introduction of the proposed mitigation measures, the impacts will be reduced at both construction and operational phases. No major adverse impacts will remain and it is therefore considered that the proposed development will not represent a significant effect on the environment from a traffic, transport and movement standpoint.