CHAPTER 14: TRANSPORT AND ACCESS

Introduction

14.1 This chapter assesses the impact of the proposed development from a traffic and transportation perspective. In particular, it considers the potential impacts of increased traffic flows on highway safety, severance, driver delay, pedestrian delay & amenity and accessibility by sustainable modes of travel.

14.2 The chapter describes the methods used to assess the impacts, the baseline conditions currently existing at the site and on the surrounding highway network, the potential direct and indirect impacts of the development, the mitigation measures required to prevent, reduce, or offset the impacts and the residual impacts.

14.3 It has been written by Curtins Consulting (Curtins) and should be read in conjunction with the following documents:

- Appendix 14.1 - Transport Assessment – Proposed Leisure Village and Residential Development, Penrhos, Holyhead, Anglesey; and
- Appendix 14.2 - Framework Travel Plan – Proposed Leisure Village and Residential Development, Penrhos, Holyhead, Anglesey.

Planning Policy Context

14.4 A detailed analysis of relevant transport planning policy is provided within Section 4 of the Transport Assessment. However, to summarise the key documents reviewed in relation to the proposal are:

National Planning Policy

- Planning Policy Wales, Chapter 8: Transport.
  Sets out the aim of extending choice in transport and extending accessibility, and is supported by a series of objectives.

- Technical Advice Note 18: Transport.
  Provides detailed guidance on implementing the transport objectives contained in Planning Policy Wales Chapter 8.

Local Planning Policy

- Isle of Anglesey Local Plan.
  Adopted in 1996 and covers the period to 2001; therefore considered largely out of date.

- Isle of Anglesey Unitary Development Plan.
  Contains policies promoting public transport, walking and cycling. "Stopped" in 2005 to allow a move towards the new Local Development Plan system. Remains a material planning consideration.

Policy T4 of the UDP states that:

Proposals which maintain and enhance public transport facilities will be permitted, particularly those which facilitate interchange at strategic locations on the

transportation network and which promote better links to, from and between interchanges by walking and cycling.

Policy TR9 of the UDP states that:

Proposals which encourage the use, enjoyment and development of the Island's designated cycle routes, designated walking routes and public rights of way network will be permitted where they can be sympathetically accommodated in the natural and built environment, and where required, are well served by public transport and adequate car parking facilities.

Approach

Assessment Methodology

14.5 Guidance for the assessment of the environmental effects of traffic is provided in the Institute of Environmental Assessment (IEA) (1993), *Guidelines for the Environmental Assessment of Road Traffic*. This document has been used in the production of this chapter. However, the unique nature of the development consisting of three separate yet interrelated sites means that the assessment has been tailored accordingly.

14.6 Furthermore, the assessment has been tailored following several scoping discussions with Highways Officers at Isle of Anglesey County Council (IOACC) and Welsh Government (WG).

14.7 A key element of these discussions was agreement that the assessment should be a worst case scenario which considers the fully built out, permanent development rather than the temporary scenario whereby Cae Glas is used to provide accommodation for the workers at Wylfa.

Assessment Criteria

14.8 The IEA guidelines recommend that the environmental effects listed in Table 2.1 of the guidance may be considered important when considering traffic from an individual development. These effects include:

- Noise;
- Vibration;
- Visual Impact;
- Severance;
- Driver delay;
- Pedestrian delay;
- Pedestrian amenity;
- Accidents and safety;
- Hazardous loads;
- Air pollution;
- Dust and dirt;
- Ecological impact; and
- Heritage and conservation.

14.9 Of these effects, many are considered in chapters elsewhere within this document due to the specialist skills required; namely noise, vibration, visual impact, air pollution, ecological effects and heritage and conservation. With regard to the remaining effects the guidance states that the following rules should be used as a screening process to delimit the scale and extent of the assessment:

- 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%); and

- Include any other specifically sensitive areas where traffic flows have increased by 10%, or more."

14.10 The IEA guidelines go on to state that any increases in traffic flows of less than 10% are generally accepted as having no discernible environmental impact as daily variance in traffic flows can be of equal magnitude.

14.11 The 30% threshold relates to the level at which humans may perceive change and there may therefore be an effect. Impacts above this level therefore do not suggest that there is a significant impact, only that further consideration is required to assess the significance.

Significance Criteria

14.12 Prior to assessing the potential impact the development will have on the baseline conditions, a standard approach for expressing the magnitude and direction of each effect is required. The magnitude of the impacts associated with the development has been categorised as follows:

- Major Beneficial - Where there is a major improvement over the current situation as a result of the development;
- Moderate Beneficial - Where there is a moderate improvement over the current situation as a result of the development;
- Minor Beneficial – Where there is a small improvement over the current situation as a result of the development;
- Negligible - Where there is no perceivable impact;
- Minor Adverse - Where there is a small impact but no mitigation measures are required;
- Moderate Adverse - Where the impact leads to moderate disruption and mitigation measures are required; and
- Major Adverse - Where the impact leads to serious and lasting disruption and major mitigation is required.

14.13 With regard to severance, which is considered later in this report, the IEA guidelines indicate that traffic flows would have to increase by more than 30% in order for a 'slight' change in severance to occur, 60% for a 'moderate' change to occur and 90% for a 'substantial' change to occur.

Assumptions / Limitations

14.14 Assumptions have been made with regard to traffic distribution and assigning the Penrhos and Cae Glas traffic to the surrounding highway network. A summary of these assumption is provided below:

- 75% of the traffic generated by the Penrhos leisure village has been assigned to the network on the basis that the trips are visitors either checking in or checking out;
- 25% of the traffic generate by the Penrhos leisure village has been assigned to the network on the basis that the trips are leisure based trips by existing guests;
- The same methodology has been applied to Cae Glas with 75% of the traffic generation associated with checking in and checking out, whilst the remaining 25% is associated with leisure based trips; and
- The Kingsland residential development traffic has been distributed based on journey to work data obtained from census information.

14.15 The traffic and transportation impacts have been assessed for a worst case scenario which considers the fully built out, permanent development rather than the temporary scenario whereby Cae Glas is used to provide accommodation/park and ride facilities for the workers at Wylfa.

Baseline Conditions

14.16 This section describes the baseline conditions at the site and on the surrounding highway network.

Existing Highway Network

14.17 A detailed description of the highway network surrounding the development is provided in Section 2 of the Transport Assessment. This includes the following junctions and all of the links that connect the junctions:

- Junction 1 - A55 Junction 1;
- Junction 2 - A55 Junction 2;
- Junction 3 - A55 Junction 3;
- Junction 4 - B4545 Kingsland Road/A5153 Roundabout;
- Junction 5 - A5153/Parc Cybi Access Roundabout;
- Junction 6 - A5153/A5 Roundabout;
- Junction 7 - A5/A5025 Crossroads; and
- Junction 8 - Penrhos Coastal Park Site Access

Existing Traffic Flows

14.18 In order to obtain base traffic flows, manual classified counts and automatic traffic counts were undertaken in 2011 at the junctions listed above. These locations were agreed with Highways Officers at IOACC and WG.

14.19 The surveys were undertaken during September 2011 at the following periods:

- The Friday AM period between 07:30 and 10:00;
- The Friday PM period between 15:30 and 18:00; and
- The Saturday period between 12:00 and 16:00.

14.20 The survey data revealed that the AM peak period on the network occurred between 08:30 and 09:30 whilst the PM peak occurred between 15.45 and 16.45. On Saturday the peak period was recorded as 12:15 to 13:15.

14.21 These time periods coincide with information provided by Land and Lakes which indicates that peak 'changeover periods' at the proposed leisure village are likely to occur between 09:00 and 11:00 and between 15:00 and 22:00.

14.22 The network peaks also coincide with some of the ferry movements such as the 15:15 Fastcraft arrival and the 08:20 Superferry departure.

14.23 A seasonal sensitivity test was also undertaken (contained in Section 7 of the TA) to examine how the September traffic counts compared to a peak summer day (August 26th, Bank Holiday Weekend). The results indicated that the surveyed data was robust and on the above basis, the peak network hours have been used for the remainder of this assessment.

Future Year Baselines

14.24 In order to assess the effect of the development, future year baseline traffic flows have been calculated by applying traffic growth and by considering the traffic flows associated with any committed developments.

14.25 The future year scenarios were determined following discussions with IOACC and WG. They include the year of application (2012) and ten years after the application (2022) when the entire development is built out and operational. No assessment has been undertaken beyond 2022 as the only difference in the flows would be background traffic growth which could be negative.

14.26 Background traffic flows have been factored to the appropriate year using the Department for Transport software TEMPRO. The methodology is set out in Section 7 of the Transport Assessment and the growth rates are summarised in Table 14.1 below.

Table 14.1: Growth Factors

Year	Lights			Heavies
	AM	PM	SAT	All
2012	1.000	1.000	1.000	1.003
2022	1.044	1.048	1.052	1.062

Cumulative Impacts

14.27 In addition to the traffic growth it was agreed with Highways Officers at IOACC and WG that the Parc Cybi mixed-use employment development should be included as committed development. The Parc Cybi development primarily consists of a mixture of B1, B2 and B8 development with some ancillary retail and leisure uses. It was due to open in 2005 but to date only the highway infrastructure has been constructed.

14.28 Extracts of the Parc Cybi TA define the traffic generation and distribution on the highway network immediately surrounding the site. The generation associated with the Parc Cybi development is summarised in Table 14.2 below:

Table 14.2: Parc Cybi Traffic Generation

	AM Peak Period	PM Peak Period
Arrivals	1195	435
Departures	295	1096
Total	1490	1531

14.29 Highways Officers at IOACC also requested that the consented Renewable Energy Plant be considered as committed development. To determine the traffic generation associated with the development the Environmental Statement prepared by Parson Brinkerhoff was reviewed. This indicated that the site will not have a significant impact on traffic and highway infrastructure because raw materials will be delivered by ship to the port of Holyhead and transported to site via existing underground tunnels. Whilst the construction phase of the project will result in increased numbers of vehicles the operational movements will be limited to a small number of employees.

14.30 The ES states that the plant will require approximately 100 staff to satisfy daily operational and maintenance requirements. As such traffic movements would be

in the order of 100 two-way movements per day. It is understood that these movements would be broken down into shifts with approximately 20 arrivals/departures per changeover period. As these periods are unlikely to coincide with the peak periods being assessed and the traffic generation is likely to be equal to daily variance on the A5 the flows are not considered any further.

14.31 The growth rates and Parc Cybi committed development flows (1500 vehicles in the AM and PM network peaks) detailed above have been applied to the 2011 observed traffic flows to determine the 2022 future year.

14.32 The resultant 2022 future baseline traffic therefore represent a robust worst case scenario in line with the discussions with IOACC and WG.

14.33 The full traffic flows are provided in the traffic figures at the back of the Transport Assessment which is attached as Appendix 14.1.

Highway Safety

14.34 Personal injury accident data has been obtained from IOACC, for a five year period between the 1st January 2007 and 31st December 2011. The study area covers the highway network surrounding the sites.

14.35 In total, there were twenty-two accidents within the study area, comprising seventeen slight accidents, five serious accidents, and one fatal accident. The annual breakdown of numbers and types of accidents is shown in Table 14.3 below.

Table 14.3:Personal Injury Collisions: Annual Totals

Severity	2007	2008	2009	2010	2011	Total
Slight	3	3	3	2	5	16
Serious	0	2	2	0	1	5
Fatal	0	1	0	0	0	1
Total	3	6	5	2	6	22

14.36 The location of each accident and a description of the contributory factors is provided in the Transport Assessment which is attached as Appendix 14.1.

Accessibility by Sustainable Modes of Travel

14.37 A key element of Traffic Advisory Note 18: Transport and other relevant policy is to ensure that new developments are located in areas where alternative modes of travel are available. It is important to ensure that developments are not isolated but are located close to complementary land uses. This supports the aims of integrating planning and transport, providing more sustainable transport choices, and reducing overall travel and car use.

14.38 The accessibility of the proposed development is considered in detail in Section 6 of the Transport Assessment, although a summary is provided below under the headings of pedestrian connectivity, cycle routes and public transport provision.

Pedestrian Infrastructure

14.39 The Penrhos Coastal Park currently has an extensive network of leisure footpaths which provide connections to various facilities whilst also offering excellent leisure opportunities for tourists and locals.

14.40 Penrhos Coastal Path runs around the perimeter of the site, with permissive access granted by AAM.

14.41 A pedestrian footpath through the Penrhos Coastal Park connects to pedestrian footways on Penrhos Beach Road. This route provides access to residential properties and shops on the A5 London Road.

14.42 There are shared footway/cycleways in place on both sides of Parc Cybi and on both sides of the A5153, providing connectivity between the Cae Glas site and the wider area. There is otherwise no public access to the Cae Glas site.

14.43 There is a footway in place on the eastern side of the B4545 Kingsland Road and intermittent footway on the western side of Kingsland Road, which provides connections between the Kingsland site and the wider area. A public footpath also crosses the site in a north/south direction.

Cycle Routes

14.44 The Penrhos Coastal Park is currently served by an existing traffic-free cycle route which forms part of National Cycle Route 8 connecting Holyhead to Cardiff.

14.45 Works have recently been carried out by IOACC to create a shared footway/cycleway along the A5 adjacent to the Penrhos site. This will further improve the attractiveness of cycling as a mode of travel throughout the area.

14.46 There are shared footway/cycleways in place on Parc Cybi, providing connectivity between the Cae Glas site and Holyhead.

14.47 There is a mix of shared footway/cycleways and mandatory cycle lanes for the full length of the B4545, including at the roundabout with Kingsland Road. This will promote cycling between the Cae Glas and Kingsland sites and the wider area.

Public Transport Provision

14.48 The nearest bus stops to the Penrhos Coastal Park are located near to the existing Tesco store at the Penrhos Retail Park, to the west of the site. These stops are served by routes 21A, 22A, 24A, 25, 61 and X4. The frequency and route of these services is summarised in Table 14.4 below.

Table 14.4: Summary of Bus Services Penrhos

		Peak Frequency			
Service	**Route**	**Monday to Friday**		**Saturday**	**Sunday**
		AM	**PM**		
21A	Holyhead - Treseifion - Penrhos	60	30	30	-
22A	Holyhead - Llaingoch - Penrhos - Caergybi	60	60	60	-
24A	Holyhead - Morawelon	30	30	30	2
25	Holyhead - Aberffraw	3 services			-
61	Holyhead - Bae Cemaes Bay - Amlwch	60	60	60	
X4	Bangor - Llangefni - Holyhead	60	60	60	-

14.49 The nearest bus stops to the Cae Glas site are located on the B4545 Lon St Ffraid to the south-east of the site. These stops are served by routes 4, 4a, X4 and 23. The frequency and route of these services is summarised in Table 14.5 below.

Table 14.5: Summary of Local Bus Services Cae Glas

Service	Route	Peak Frequency		
		Monday to Friday		Saturday
		AM	PM	
4	Bangor - Llangefni - Holyhead	30	40	30
X4	Bangor - Llangefni - Holyhead	60	60	60
23	Holyhead - Rhoscolyn circular	60	-	60

14.50 The nearest bus stops to the Kingsland site are located on the B4545 to the north of the site and on the B4545 on the outskirts of Treaddur Bay. These stops are utilised by service numbers 4, 4a, X4 and 23. The frequency and route of these services is summarised in Table 14.6 below.

Table 14.6 – Summary of Local Bus Services Kingsland

Bus Service	Route	Peak Frequency		
		Monday to Friday		Saturday
		AM	PM	
4	Bangor - Llangefni - Holyhead	30	40	30
X4	Bangor - Llangefni - Holyhead	60	60	60
23	Holyhead - Rhoscolyn circular	60	-	60

Proposed Transport and Access Arrangements

14.51 Details of the access arrangements are presented in Chapter 5. However, for ease of reference they are summarised here.

14.52 The primary access to the Penrhos site will be via a three-arm roundabout junction on the A5 London Road. The northern arm of this roundabout will extend in a northerly direction between the gatehouse and the existing water body. Pedestrian crossing facilities will be incorporated into the roundabout via a splitter island on the western arm of the roundabout. The proposed roundabout offers benefits in terms of reduced traffic speeds and improved pedestrian crossing facilities across the A5. The proposed roundabout is shown in Figure 5.16.

14.53 An additional access point into the site will be via the existing Penrhos Beach Road priority junction which will be retained in its current form. Vehicles arriving at Penrhos from the east are likely to use the roundabout access therefore this access will mainly accommodate vehicles exiting the site or arriving from Holyhead.

14.54 The primary access to the Cae Glas site will be via the infrastructure that was installed as part of the Parc Cybi employment development. At the terminus of the Parc Cybi infrastructure there is a roundabout beyond which extends a single lane carriageway. This road will be developed and partially realigned to provide highway access into the Cae Glas site. It also includes widening of the existing carriageway which will reduce driver delay and seeks to enhance safety. The proposed access arrangements are shown in Figure 5.17.

14.55 It is proposed that Kingsland development is primarily accessed via a new access point approximately 45 metres to the south of the existing access. This junction takes the form of a new priority controlled junction with right turning ghost island. It has been designed to Design Manual for Streets and Bridges standards for a 40mph road and is shown in Figure 5.18. The access will also incorporate pedestrian crossing facilities across the southern arm of the junction, a new footway on the western side of the carriageway and two new bus stops. The

proposed Kingsland access offers benefits in terms of improved pedestrian crossing facilities across Kingsland Road.

Potential Impacts

Construction

14.56 Chapter 6 of this report details the indicative construction programme, its potential environmental impacts and suitable controls and mitigation measures. The following section sets out the potential impacts from a transport and access perspective.

14.57 The construction of the proposed development will result in a temporary increase of Heavy Goods Vehicles (HGVs) and cars carrying construction workers and materials on roads surrounding the sites. A large proportion of this traffic will be associated with the construction of the Penrhos and Cae Glas leisure developments.

14.58 The lodges that make up the majority of these sites will largely be prefabricated. It is assumed that 2 HGVs will be required to deliver one lodge in component parts. The 815 lodges assessed as part of this EIA could therefore generate 1,630 HGVs. When spread over the 5 year construction period associated with the leisure sites this could equate to 326 HGVs per annum. It is recognised that there will be other HGV movements associated with construction, but the delivery of the lodges is likely to be the most significant generator.

14.59 The construction traffic associated with the Kingsland development would take place over an 8 year period using standard construction techniques. Annual HGV movements are envisaged to be significantly less than the leisure village construction.

14.60 It is considered that the volume of construction traffic detailed above would not represent a significant increase in traffic, and additional flows on any one link would be well below the 10% increase in traffic set out in the IEA Guidelines.

14.61 It is considered that the volume of traffic associated with the construction of the proposed development will be temporary in nature and would lead to a **Moderate Adverse** impact.

Completed Development

Traffic Generation

14.62 The methodology used to calculate the traffic generation associated with the proposed development is covered in detail in the Transport Assessment and a summary of the results is provided below in Tables 14.7 to 14.8.

Table 14.7: Traffic Generation Weekday Peak Hours 2022

2022 Weekday						
	AM Peak (08.30-09.30)			PM Peak (15.45-16.45)		
Element	**Arrivals**	**Departures**	**Total**	**Arrivals**	**Departures**	**Total**
Penrhos	28	45	74	47	30	77
Cae Glas	43	56	99	51	39	90
Kingsland	58	121	179	121	75	195
Total	**129**	**222**	**352**	**219**	**144**	**362**

Table 14.8 – Traffic Generation Saturday Peak Hour 2022

	2022		
	SAT Peak (12.15-13.15)		
Element	**Arrivals**	**Departures**	**Total**
Penrhos	32	23	54
Cae Glas	45	42	87
Kingsland	92	75	167
Total	**169**	**140**	**308**

Traffic Distribution and Assignment

14.63 The distribution for the Penrhos and Cae Glas sites is based on an assumption that 75% of traffic will be checking in and checking out whilst 25% will be undertaking leisure trips.

14.64 The distribution for the Kingsland site is based on journey to work information obtained from census data.

14.65 Full details of the trip distribution and assignment of trips is set out within Section 7 of the Transport Assessment.

Quantification of Impact

14.66 In line with the IEA guidance, the percentage impact of the traffic has been calculated for the future year of 2022. The results are summarised in Tables 14.9, 14.10 and 14.11.

Table 14.9: Comparison of Future Baseline and Future Year Flows Weekday AM Peak Period

Link	**AM Peak**			
	Base	**Base + Dev**	**Abs. Diff.**	**% Diff.**
1. A5154 north of Kingsland Road	973	1018	45	5%
2. A55 south of A5154	816	820	4	1%
3. Kingsland Road south of A5154	704	757	53	8%
4. Kingsland Road north of A5154	595	607	12	2%
5. Kingsland Road north of A5153	495	548	53	11%
6. A5153 east of Kingsland Road	618	757	139	22%
7. Kingsland Road south of A5153	574	759	185	32%
8. Leisure Centre Access	28	28	0	0%
9. Parc Cybi north of A5153	0	0	0	0%
10. A5153 east of Parc Cybi	1341	1551	210	16%
11. Parc Cybi south of A5153	1440	1534	94	7%
12. A55 J2 N/B On-slip	131	133	2	2%
13. A55 J2 S/B Off-slip	254	256	2	1%
14. A55 J2 S/B On-slip	249	338	88	35%
15. A55 J2 N/B Off-slip	719	774	55	8%
16. A5153 Bridge over A55 @ J2	992	1150	158	16%
17. A5153 east of A55 J2	1049	1120	71	7%
18. A5153 west of A5	1091	1158	67	6%

19. Tesco Access	263	270	7	3%
20. A5 London Road north of A5153	802	849	47	6%
21. A5 London Road south of A5153	806	832	25	3%
22. A5 London Road north of Beach Road	772	851	79	10%
23. Beach Road east of A5	19	19	0	0%
24. A5 London Road south of Beach Road	773	852	79	10%
25. A5 Holyhead Road north of A5025	867	946	79	9%
26. A5025 east of A5	523	530	8	1%
27. A5 Holyhead Road south of A5025	760	830	70	9%
28. B4545 Station Road	490	491	1	0%
29. A5 Holyhead Road north of A55 J3	684	754	70	10%
30. J5 E/B On-slip	218	261	43	20%
31. J5 W/B Off-slip	198	225	26	13%
32. A5 Holyhead Road south of A55 J3	369	369	0	0%
33. Farm Access	1	1	0	0%
34. A55 J3 W/B On-slip	80	80	0	0%
35. A55 J3 E/B Off-slip	68	68	0	0%
36. A5 Holyhead Road Bridge over A55 @ J3	733	803	70	10%
37. A5 London Road north of Penrhos Access 1	772	818	46	6%
38. Penrhos Access 1	0	37	37	0%
40. Penrhos Access 2	0	0	0	0%
41. A5 London Road north of Penrhos Access 2	806	853	46	6%
42. Penrhos Access 3	0	48	48	0%
43. Parc Cybi north of Cae Glas Access	20	114	94	472%
44. Cae Glas Access	0	94	94	0%
45. Parc Cybi south of Cae Glas Access	20	20	0	0%
46. Kingsland Access	0	191	191	0%
47. Kingsland Road south of Kingsland Access	574	601	27	5%

Table 14.10 Comparison of Baseline and Future Year Flows Weekday PM Peak Assessment

Link	PM Peak			
	Base	Base + Dev	Abs. Diff.	% Diff.
1. A5154 north of Kingsland Road	1302	1351	49	4%
2. A55 south of A5154	1106	1111	5	0%
3. Kingsland Road south of A5154	992	1049	57	6%
4. Kingsland Road north of A5154	634	648	13	2%
5. Kingsland Road north of A5153	629	686	57	9%
6. A5153 east of Kingsland Road	752	901	149	20%
7. Kingsland Road south of A5153	693	893	200	29%
8. Leisure Centre Access	106	106	0	0%
9. Parc Cybi north of A5153	0	0	0	0%
10. A5153 east of Parc Cybi	1573	1787	214	14%
11. Parc Cybi south of A5153	1574	1658	84	5%

12. A55 J2 N/B On-slip	265	267	2	1%
13. A55 J2 S/B Off-slip	373	376	3	1%
14. A55 J2 S/B On-slip	668	726	58	9%
15. A55 J2 N/B Off-slip	444	528	85	19%
16. A5153 Bridge over A55 @ J2	1536	1666	131	9%
17. A5153 east of A55 J2	1482	1558	76	5%
18. A5153 west of A5	1476	1548	71	5%
19. Tesco Access	386	393	7	2%
20. A5 London Road north of A5153	1001	1051	50	5%
21. A5 London Road south of A5153	1062	1089	27	3%
22. A5 London Road north of Beach Road	998	1081	83	8%
23. Beach Road east of A5	35	35	0	0%
24. A5 London Road south of Beach Road	986	1068	83	8%
25. A5 Holyhead Road north of A5025	1055	1137	83	8%
26. A5025 east of A5	726	735	8	1%
27. A5 Holyhead Road south of A5025	886	959	73	8%
28. B4545 Station Road	672	673	1	0%
29. A5 Holyhead Road north of A55 J3	838	910	73	9%
30. J5 E/B On-slip	309	337	28	9%
31. J5 W/B Off-slip	302	346	44	15%
32. A5 Holyhead Road south of A55 J3	349	350	0	0%
33. Farm Access	12	12	0	0%
34. A55 J3 W/B On-slip	74	74	0	0%
35. A55 J3 E/B Off-slip	53	54	0	0%
36. A5 Holyhead Road Bridge over A55 @ J3	880	952	73	8%
37. A5 London Road north of Penrhos Access 1	998	1040	41	4%
38. Penrhos Access 1	0	45	45	0%
40. Penrhos Access 2	0	0	0	0%
41. A5 London Road north of Penrhos Access 2	1062	1104	41	4%
42. Penrhos Access 3	0	43	43	0%
43. Parc Cybi north of Cae Glas Access	43	127	84	196%
44. Cae Glas Access	0	84	84	0%
45. Parc Cybi south of Cae Glas Access	43	43	0	0%
46. Kingsland Access	0	208	208	0%
47. Kingsland Road south of Kingsland Access	693	720	28	4%

Table 14.11: Comparison of Baseline and Future Year Flows Saturday

Link	Saturday Peak			
	Base	Base + Dev	Abs. Diff.	% Diff.
1. A5154 north of Kingsland Road	968	1009	41	4%
2. A55 south of A5154	912	915	3	0%
3. Kingsland Road south of A5154	819	868	49	6%
4. Kingsland Road north of A5154	437	448	11	3%
5. Kingsland Road north of A5153	418	467	49	12%
6. A5153 east of Kingsland Road	360	488	128	36%
7. Kingsland Road south of A5153	523	694	171	33%
8. Leisure Centre Access	65	65	0	0%
9. Parc Cybi north of A5153	0	0	0	0%
10. A5153 east of Parc Cybi	360	551	191	53%
11. Parc Cybi south of A5153	21	103	82	392%
12. A55 J2 N/B On-slip	173	174	1	1%
13. A55 J2 S/B Off-slip	269	272	2	1%
14. A55 J2 S/B On-slip	200	261	61	30%
15. A55 J2 N/B Off-slip	293	362	69	24%
16. A5153 Bridge over A55 @ J2	707	830	123	17%
17. A5153 east of A55 J2	1114	1178	65	6%
18. A5153 west of A5	1046	1107	61	6%
19. Tesco Access	367	374	6	2%
20. A5 London Road north of A5153	801	843	42	5%
21. A5 London Road south of A5153	741	762	21	3%
22. A5 London Road north of Beach Road	660	720	60	9%
23. Beach Road east of A5	38	38	0	0%
24. A5 London Road south of Beach Road	656	716	60	9%
25. A5 Holyhead Road north of A5025	735	795	60	8%
26. A5025 east of A5	513	519	7	1%
27. A5 Holyhead Road south of A5025	660	712	52	8%
28. B4545 Station Road	514	515	1	0%
29. A5 Holyhead Road north of A55 J3	599	651	52	9%
30. J5 E/B On-slip	221	243	22	10%
31. J5 W/B Off-slip	251	281	30	12%
32. A5 Holyhead Road south of A55 J3	184	184	0	0%
33. Farm Access	8	8	0	0%
34. A55 J3 W/B On-slip	47	47	0	0%
35. A55 J3 E/B Off-slip	39	39	0	0%
36. A5 Holyhead Road Bridge over A55 @ J3	606	659	52	9%
37. A5 London Road north of Penrhos Access 1	660	692	32	5%
38. Penrhos Access 1	0	32	32	0%
40. Penrhos Access 2	0	0	0	0%
41. A5 London Road north of Penrhos Access 2	741	773	32	4%

42. Penrhos Access 3	0	31	31	0%
43. Parc Cybi north of Cae Glas Access	21	103	82	392%
44. Cae Glas Access	0	82	82	0%
45. Parc Cybi south of Cae Glas Access	21	21	0	0%
46. Kingsland Access	0	178	178	0%
47. Kingsland Road south of Kingsland Access	523	547	24	5%

14.67 The results demonstrate that the proposed development is expected to generate a less than 10% increase in traffic flows on the majority of links within the study area. In line with the IEA guidance it is not necessary to assess the environmental effects on any roads which experience an increase in traffic of less than 10%.

14.68 However, the results also indicate that three links out of 47 will exceed the 30% threshold during the AM peak period, one link exceeds the threshold during the PM peak period and six links exceed the threshold during the Saturday peak period. On this basis further assessment is required in line with the IEA guidance.

14.69 In addition to the links which exceed the 30% threshold there are 10 links that exceed the 10% (but not 30%) threshold in the AM peak period, five links that exceed the threshold in the PM peak period and five links that exceed the threshold during the Saturday peak period. The IEA guidance states that these links should be assessed if in sensitive locations. Given that many of these roads border the Area of Outstanding Natural Beauty, further assessment has been undertaken.

Further Assessment

14.70 In line with the IEA assessment criteria detailed earlier in this report, the effects of the proposed development must be assessed on any link which exceeds the 30% threshold in any of the periods assessed. This includes the following links:

- Link 6 - A5153 east of Kingsland Road (Saturday);
- Link 7 - Kingsland Road south of A5153 (AM, Saturday);
- Link 14 - A55 J2 S/B On-slip (AM, Saturday);
- Link 43 - Parc Cybi north of Cae Glas Access (AM, PM, Saturday);
- Link 11 - Parc Cybi south of A5153 (Saturday); and
- Link 10 - A5153 east of Parc Cybi (Saturday).

14.71 In addition, the following links exceed 10% in some of the periods considered and to be robust these have also been assessed:

- Link 5 – Kingsland Road north of A5154 (AM, Saturday);
- Link 6 - A5153 east of Kingsland Road (AM, PM);
- Link 7 - Kingsland Road south of A5153 (PM);
- Link 10 – A5153 east of Parc Cybi (AM, PM);
- Link 15 – A55 J2 N/B Off-slip (PM, Sat);
- Link 16 – A5153 Bridge over A55 J2 (AM, PM, Saturday);
- Link 22 – A5 London Road north of Beach Road (AM);
- Link 24 – A5 London Road South of Beach Road (AM);
- Link 29 – A5 Holyhead Road north of A55 J3 (AM);
- Link 30 – J3 E/B On-slip (AM, Saturday);
- Link 31 – J3 W/B On slip (AM, PM, Saturday); and
- Link 36 – A5 Holyhead Road Bridge over A55 J3 (AM).

Severance

14.72 Severance is the perceived division that can occur when a community is separated. This can be due to a heavily trafficked road or a physical barrier created by the road itself.

14.73 The IEA guidelines indicate that traffic flows would have to increase by more than 30% in order for a 'slight' change in severance to occur, 60% for a 'moderate' change to occur and 90% for a 'substantial' change to occur. On this basis only the links that experience traffic increases of 30% or more are considered below. The links that experience between 10% and 30% increases in traffic are considered to have a less than 'slight' change in severance.

14.74 With regard to the A5153 (Links 6 and 10), the impact during the AM and PM weekday periods is less than 30%. During the Saturday peak period the impact is 36% and 53% respectively. In line with the guidance this is considered to be a 'slight' change in severance. Furthermore, there is no active frontage either side of the road and there are pedestrian crossing facilities in the form of dropped kerbs and pedestrian refuge islands.

14.75 With regard to Kingsland Road (Link 7), the impact is greater than 30% during the AM and Saturday peak periods. However, the impact is marginally over 30% and is therefore considered to be a 'slight' change in severance. It should also be noted that there is limited frontage on the eastern side of Kingsland Road and therefore pedestrian desire lines across Kingsland Road are likely to be limited.

14.76 With regard to the A55 J2 S/B On-slip (Link 14), there is no requirement for pedestrians to cross the road in this location. Therefore severance is not considered to be an issue.

14.77 With regard to Parc Cybi (Links 43 and 11), the background traffic flows are so low that the percentage impact assessment is misleading. The actual increase in vehicle numbers is 94 during the AM peak period, 84 during the PM peak period and 82 during the Saturday peak period. This number of vehicles is unlikely to have any material impact on severance especially as Parc Cybi has excellent pedestrian infrastructure.

14.78 Based on the above it is considered that the significance of the effect on severance once the development is completed would be **Negligible.**

Driver Delay

14.79 Traffic delays to non-development traffic can occur as a result of increased traffic flows on the network as a result of the development. This generally occurs at junctions where there are additional turning movements.

14.80 As part of the Transport Assessment, junction capacity assessments have been undertaken at all of the key junctions in the vicinity of the site and the full results are contained in Section 8 of the Transport Assessment.

14.81 The results of the capacity assessments demonstrate that the proposed Penrhos, Cae Glas and Kingsland access points can all accommodate the development traffic and work well within capacity. Furthermore, the following off-site junctions have all been assessed:

- Junction 1 - A55 Junction 1;
- Junction 2 - A55 Junction 2;
- Junction 3 - A55 Junction 3;

- Junction 4 - B4545 Kingsland Road/A5153 Roundabout;
- Junction 5 - A5153/Parc Cybi Access Roundabout;
- Junction 6 - A5153/A5 Roundabout; and
- Junction 7 - A5/A5025 Crossroads.

14.82 The results indicate that junctions 1,3,4,6 and 7 currently operate well within capacity and would continue to do so in 2022 with the addition of committed development traffic and development traffic.

14.83 Based on the above it is considered that the significance of the effect on driver delay at these junctions once the development is completed would be **negligible**.

14.84 However, further consideration is required for Junction 2 of the A55 and the Parc Cybi Access Roundabout.

Junction 2 of the A55

14.85 The results of the capacity assessment indicate that that the junction currently operates well within capacity during the AM, PM and Saturday peak period. However, when the Parc Cybi committed development is considered, the RFC on the A55 N/B Off-slip and A5153 West arms increases significantly.

14.86 When the development traffic is also considered, the RFC on the A55 N/B Off-slip and A5153 West arms exceeds 0.85 which is considered to be the practical capacity of the link. However, it should be noted that the links still operate well within their actual capacity of 1.0 and the increase in queuing is considered to be immaterial.

14.87 It should also be noted that there is no certainty that the Parc Cybi development will come forward in its consented form and the original timescales for its delivery have already slipped by seven years.

14.88 On balance, the development is considered to cause a **Minor Adverse** effect on this junction.

Parc Cybi/A5153 Roundabout and A5153/Kingsland Roundabout

14.89 The above roundabouts have been modelled together to assess the interaction between the two roundabouts.

14.90 The results indicate that both roundabouts currently operate well within capacity during the AM, PM and Saturday peak periods.

14.91 As with Junction 2 of the A55, the addition of the consented Parc Cybi traffic has a significant impact on the operation of the junction and causes the Parc Cybi and A5153 eastern arm on the approach to Parc Cybi to operate with an Ration to Flow Capacity (RFC) above 0.85. The addition of the development traffic increases the RFC further, although it still remains under 1.0.

14.92 Based on the above it is considered that the significance of the effect on driver delay at these two junctions would be **Minor Adverse.**

Pedestrian Delay and Amenity

14.93 Changes in the volume, composition or speed of traffic may affect the ability of people to cross roads and increases in traffic generally lead to greater increase in delay for pedestrians. The IEA guidance indicates that a two-way link flow of

approximately 1,400 vehicles per hour broadly equates to a 10 second pedestrian delay in crossing a road.

14.94 Based on the above guidance the actual delay can be calculated for each of the links which exceed 30% as summarised below in Table 14.12 and 14.13.

Table 14.12: Pedestrian Delay Weekday Peak Periods

Link	AM Actual Increase	AM Delay (seconds)	PM Actual Increase	Delay (seconds)
Link 6 - A5153 east of Kingsland Road	139	1	149	1.1
Link 7 - Kingsland Road south of A5153	185	1.3	200	1.4
Link 14 - A55 J2 S/B On-slip	88	1	58	0
Link 43 - Parc Cybi north of Cae Glas Access	94	1	84	1
Link 11 - Parc Cybi south of A5153	94	1	84	1
Link 10 - A5153 east of Parc Cybi	210	1.5	214	1.5
Link 5 – Kingsland Road north of A5154	53	1	57	1
Link 15 – A55 J2 N/B Off-slip	55	1	85	1
Link 16 – A5153 Bridge over A55 @J2	158	1.1	131	1
Link 22 – A5 London Road north of Beach Road	79	1	83	1
Link 24 – A5 London Road South of Beach	79	1	83	1
Link 29 – A5 Holyhead Road north of A55 J3	70	1	73	1
Link 30 – J3 E/B On-slip	43	1	28	1
Link 31 – J3 W/B On slip	26	1	44	1
Link 36 – A5 Holyhead Road Bridge over A55 @J3	70	1	73	1

Table 14.13: Pedestrian Delay Saturday

Link	Saturday	
	Actual Increase	Delay (seconds)
Link 6 - A5153 east of Kingsland Road	128	1
Link 7 - Kingsland Road south of A5153	171	1.2
Link 14 - A55 J2 S/B On-slip	61	1
Link 43 - Parc Cybi north of Cae Glas Access	82	1
Link 11 - Parc Cybi south of A5153	82	1
Link 10 - A5153 east of Parc Cybi	191	1.9
Link 5 – Kingsland Road north of A5154	49	1
Link 15 – A55 J2 N/B Off-slip	69	1

Link 16 – A5153 Bridge over A55 @J2	123	1
Link 22 – A5 London Road north of Beach Road	60	1
Link 24 – A5 London Road South of Beach	60	1
Link 29 – A5 Holyhead Road north of A55 J3	60	1
Link 30 – J3 E/B On-slip	22	1
Link 31 – J3 W/B On slip	30	1
Link 36 – A5 Holyhead Road Bridge over A55 @J3	52	1

14.95 The results demonstrate that the greatest delay to pedestrians is less than 2 seconds. This is not likely to be noticeable and would not impact upon the ability of pedestrians to cross the road.

14.96 With regards to pedestrian amenity, fear and intimidation are the biggest factors. The guidance suggests that moderate (the lowest category) fear and intimidation could be experienced when average traffic flows over an 18 hour period are between 600 and 1,200 vehicles per hour.

14.97 Table 14.10, earlier in this report, demonstrates that only a few links exceed a flow of 1,200 vehicles per hour and this is largely limited to the PM peak period when traffic flows are at their highest. Therefore, when averaged over 18 hours the flows will reduce significantly and no links are envisaged to exceed 1,200 vehicles per hour.

14.98 Based on the above it is considered that the significance of the effect on pedestrian delay and amenity during the operational phase would be **Negligible.**

Accidents and Safety

14.99 As part of the Transport Assessment highway safety has been considered in detail and a summary is provided in the baseline section of this ES.

14.100 Of the 22 accidents that occurred in the study area during a five year period, eight occurred on links where the percentage increase in traffic exceeded the 30% threshold. Six of these accidents occurred on Kingsland Road (Link 7) and two occurred on the A5153 (Links 6 and 11).

14.101 Having reviewed each accident in detail there is nothing to suggest that the proposed development would exacerbate an existing highway safety issue. Furthermore, infrastructure improvements that are to be provided as the part of the development are envisaged to have beneficial effects with regard to highway safety. Of particular importance are the the following improvements:

- The new roundabout on the A5 to provide access into the Penrhos site. This roundabout will potentially reduce vehicle speeds on the A5 therefore potentially reducing the number and severity of speed related accidents.

- The new priority junction on Kingsland Road to provide access into the Kingsland site. This will include a pedestrian crossing facility, new footways and a right turning pocket.

14.102 Based on the above it is considered that the significance of the effect on accidents and safety during the operation phase would be **Minor Beneficial.**

Hazardous Loads

14.103 No hazardous loads are envisaged as a result of the proposed development and on this basis it is considered that the significance of the effect would be **Negligible.**

Accessibility

14.104 In addition to the effects considered above, consideration has been given to significance of the impact on accessibility by sustainable modes of travel.

14.105 As part of the completed development there will be a number of improvements that will enhance accessibility and these are summarised below:

- Existing footpaths and cycle paths within the Penrhos site and Penrhos Coastal Park, including the Coastal Path will be upgraded, maintained and open to the public as part of the development proposals;
- A new pedestrian footway will be provided on the western side of Kingsland Road, and a new pedestrian crossing will be constructed on Kingsland Road close to the Kingsland site access;
- High quality, well-lit pedestrian linkages will be provided within all three sites to promote travel on-foot. This includes an extensive network of new and improved footways at Penrhos and improved connectivity for the Cae Glas and Kingsland sites;
- Public transport use will be supported by the provision of new bus stops on Kingsland Road adjacent to the site access;
- A new green shuttle bus will provide access between the Cae Glas and Penrhos sites, the railway station, ferry terminal and local shops;
- The leisure developments at Penrhos and Cae Glas will contain facilities such as shops, bars, restaurants, sports facilities and entertainment to reduce the need to travel by car; and
- All three sites will incorporate cycle parking. The Penrhos and Cae Glas Leisure Villages will also rent bicycles to visitors.

14.106 Based on the above it is considered that the impact on accessibility when the development is completed would be **Major Beneficial.**

Summary of Effects

14.107 As set out above, the effect of road traffic as a result of the proposed development is considered to have a negligible impact with regard to severance, pedestrian delay and amenity, accidents and safety and hazardous loads. However, the development will have an adverse impact with regard to driver delay. This is summarised in table 14.4 below:

Table 14.14: Summary of Effects

Phase	Nature of Effect	Duration	Significance
Construction	Construction traffic	Temporary	Moderate Adverse
Completion	Severance	Permanent	Negligible

	Driver Delay – Penrhos Site Access	Permanent	Negligible
	Driver Delay – Cae Glas Site Access	Permanent	Negligible
	Driver Delay – Kingsland Site Access	Permanent	Negligible
	Driver Delay - A55 Junction 1	Permanent	Negligible
	Driver Delay - A55 Junction 3	Permanent	Negligible
	Driver Delay - B4545 Kingsland Road/A5153 Roundabout	Permanent	Negligible
	Driver Delay - A5153/A5 Roundabout	Permanent	Negligible
	Driver Delay - A5/A5025 Crossroads	Permanent	Negligible
	Driver Delay - A5153/Parc Cybi Access Roundabout	Permanent	Minor Adverse
	Driver Delay - A55 Junction 2	Permanent	Minor Adverse
	Pedestrian Delay and Amenity	Permanent	Negligible
	Accidents and Safety	Permanent	Minor Beneficial
	Hazardous Loads	Permanent	Negligible
	Impact on Accessibility	Permanent	Major Beneficial

Mitigation Measures

14.108 This section describes the measures which are required to mitigate any environmental impacts.

Construction

14.109 Construction traffic is of a temporary nature and as a result it would be inappropriate to provide permanent physical infrastructure to fully mitigate the environmental impacts. However, on and off site practices would be implemented to control and mitigate the additional traffic.

14.110 Given the scale and nature of the project a Construction Environmental Management Plan (CEMP) is proposed. This outlines a list of control procedures which specify legislation, standards and best practice methods which should be adhered to during construction works.

14.111 The CEMP will be presented to IOACC prior to the commencement of works. The CEMP will include but will not be limited to the following:

- A plan showing the phasing of the demolition and construction programme;
- Baseline levels for noise, vibration and dust; with monitoring protocols;
- Environmental control measures; and
- Any requirements for monitoring and record keeping.

14.112 Part of the environmental controls will include restrictions on working hours. These will be subject to agreement with IOACC. However, it has been assumed that the following working hours would be followed:

- Monday – Friday : 08:00 - 18:00;
- Saturday: 09:00 - 18:00; and
- No working on Sundays or Bank Holidays.

14.113 Exceptions may arise, for example when abnormal loads are delivered or when specialist activities are conducted. The applicant acknowledges that should these

circumstances arise the appropriate permissions and notifications would be sought from IOACC.

14.114 Additional environmental controls include agreement on route management strategies to ensure that HGVs travel outside of peak periods where possible and avoid sensitive areas.

14.115 In relation to construction workers, sustainable transport choices will be encouraged so that the number of cars is kept to a minimum. Where workers do travel by car, dedicated car parking facilities will be provided so that vehicles do not park on the public highway.

14.116 The nuisance arising from construction traffic would be mitigated via the CEMP and considerate construction practices as detailed above.

Completed Development

14.117 No mitigation measures are required with regard to severance, driver delay or pedestrian delay & amenity because the development proposals are considered to have a negligible or, at worst, a minor adverse impact.

14.118 No mitigation measures are required with regard to accidents and safety or hazardous loads as the development proposals are considered to have a negligible or beneficial impact.

14.119 No mitigation measures are required with regard to accessibility as the development proposals are considered to have a beneficial impact.

Residual Impacts

14.120 The significance of the impacts has been reassessed following the mitigation measures discussed above.

Construction

14.121 It is expected that the mitigation measures outlined above would mitigate the impacts associated with construction traffic. Nonetheless, the impacts cannot be completely mitigated and it is anticipated that there would still be a temporary **minor adverse** impact.

Completed Development

14.122 It is considered that the only residual effect that would remain in relation to the completed development is a permanent **Minor Adverse** impact on driver delay at the Parc Cybi access and Junction 2 of the A55.

14.123 Whilst the highway network can accommodate the traffic associated with the proposed development there will be an increase in traffic flows that may be perceptible to some road users.

14.124 Otherwise, impacts remain as stated in the potential impacts section.

14.125 A summary of the residual effects is provided below in Table 14.15.

Table 14.5: Summary of Residual Effects

Phase	Nature of Effect	Duration	Significance of Effect	Residual
Construction	Construction traffic	Temporary	Moderate Adverse	Minor Adverse
Operation	Impact on Accessibility	Permanent	Major Beneficial	Major Beneficial
	Severance	Permanent	Negligible	Negligible
	Driver Delay – Penrhos Site Access	Permanent	Negligible	Negligible
	Driver Delay – Cae Glas Site Access	Permanent	Negligible	Negligible
	Driver Delay – Kingsland Site Access	Permanent	Negligible	Negligible
	Driver Delay - A55 Junction 1	Permanent	Negligible	Negligible
	Driver Delay - A55 Junction 3	Permanent	Negligible	Negligible
	Driver Delay - B4545 Kingsland Road/A5153 Roundabout	Permanent	Negligible	Negligible
	Driver Delay - A5153/A5 Roundabout	Permanent	Negligible	Negligible
	Driver Delay - A5/A5025 Crossroads	Permanent	Negligible	Negligible
	Driver Delay - A5153/Parc Cybi Access Roundabout	Permanent	Minor Adverse	Minor Adverse
	Driver Delay - A55 Junction 2	Permanent	Minor Adverse	Minor Adverse
	Pedestrian Delay and Amenity	Permanent	Negligible	Negligible
	Accidents and Safety	Permanent	Beneficial	Minor Beneficial
	Hazardous Loads	Permanent	Negligible	Negligible

Conclusions

14.126 The construction and operational impacts of the proposed development have been assessed in accordance with the requirements of the relevant guidance.

14.127 It is concluded that the increase in traffic associated with the proposed development will not create a significant impact in environmental terms. Furthermore, there will be a positive effect in terms of public transport provision and highway safety.

14.128 Overall there are no significant impacts associated with traffic and transportation such that planning permission should be refused.

References

Institute of Environmental Assessment, (1993) *Guidelines for the Environmental Assessment of Road Traffic*. F.W. CUPIT (Printers LTD), Lincolnshire.