

RhonddaCynonTaf



RHONDDA CYNON TAF

Strategic Transport Assessment

October 2007

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Strategic Transport Assessment

Author: Chris Evans

Checker: Tristan Brooks

Approver: Matt Thomas

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Hyder Consulting (UK) Limited

HCL House, St Mellons Business Park, St Mellons, Cardiff CF3 0EY, United Kingdom
Tel: +44 (0)870 000 3001 Fax: +44 (0)870 000 3901 www.hyderconsulting.com



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1 Executive Summary

Hyder Consulting were commissioned by Rhondda Cynon Taf ('RCT') County Borough Council to assess eight strategic sites in terms of their associated traffic impact upon the strategic highway network.

This report has addressed the transport implications of forecast development on RCT's eight strategic sites, varying in size from 28 – 409ha. We have considered each site on its own merit and the potential cumulative impact of the eight sites and have suggested ways of improving the accessibility to these areas to mitigate against the impact on the highway network.

In order to appraise the impacts (solely & cumulatively) we have made numerous assumptions as to how much of the site can be developed, percentage land use (GFA) and trip distribution. To assess traffic distribution we have constructed a gravity model. Throughout our assumption process we have maintained a worst case scenario as we feel it is important to understand what would happen should this be borne out.

As a minimum, we would recommend that for each site the following is undertaken prior to achieving a planning consent;

- Transport Assessment;
- Travel Plan;
- Corridor Study;
- Sustainability/accessibility study to include benefits of 'pump priming';
- Detailed accident analysis;
- 2025 horizon key junction studies.

We would recommend that the key to developing these sites sustainably is to ensure that the correct infrastructure is in place prior to first occupation. This could be achieved by developer pump priming.

With respect to the cumulative impact of the eight strategic development sites, it is difficult to be certain what the exact impact would be. What is more certain is that the impact would be seriously detrimental to the existing highway network (especially as most highway links would be over capacity by 2025 with just background growth). We would recommend that a county wide strategic traffic model (ie PARAMICS) is constructed so that the impacts can be considered in more detail.

This model could also be used to test the impact of individual development on the strategic highway network. Developers could be asked to contribute to the review of this impact by using the model and this would effectively act as a development control tool and as a means of recovering the cost of the initial capital outlay of a model.

2 Introduction

2.1 Introduction

Hyder Consulting were commissioned by Rhondda Cynon Taf ('RCT') County Borough Council to assess eight strategic sites in terms of their associated traffic impact upon the strategic highway network.

2.2 Brief

The scope of this report, as defined within RCT's brief, requires this assessment to consider the following tasks:

- Review the baseline traffic data for the County Borough and undertake the necessary primary / secondary research required to ameliorate any omissions;
- Access the implications of each of the eight strategic sites on the existing highway network in RCT and adjoining authorities;
- Access the cumulative of the eight strategic sites on the existing highway network in RCT and adjoining authorities;
- Identify the improvements required on a site by site basis to mitigate against the impact of these developments on the highway network;
- Identify the improvements required to mitigate against the cumulative impact of these developments on the highway network;
- Identify an effective mechanism for securing the necessary contributions to fund major improvements to the highway network. Consider how this mechanism will operate over the plan period; and
- Make recommendations for further detailed work in respect of these issues that could be undertaken by the Council.

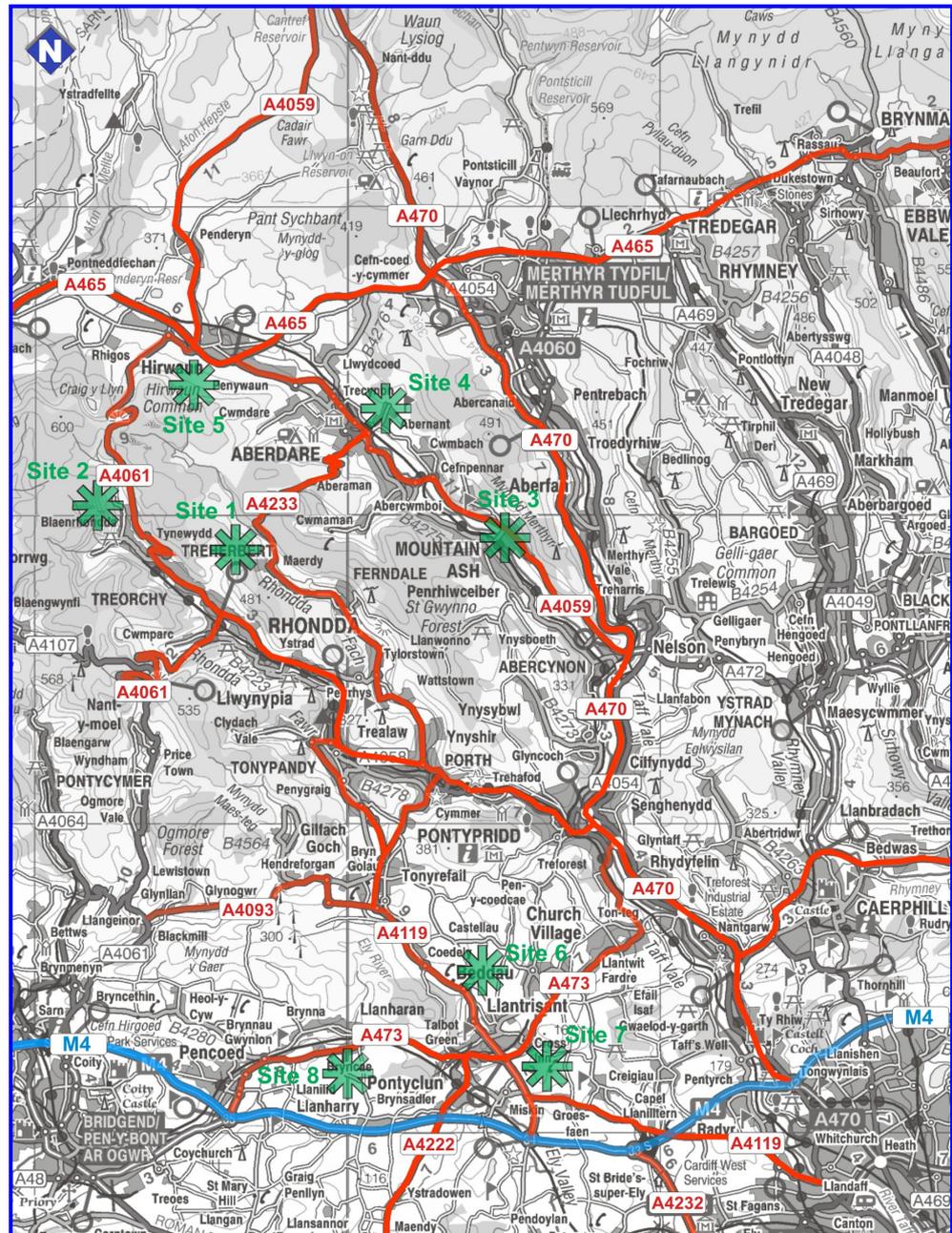
2.3 Overview

This Strategic Transport Assessment has established a baseline traffic flow from all available survey data and then growth factors have been applied to this data to allow for forecast future year traffic flows to be tested. Development size and mix has been assumed for each of the strategic development sites and appropriate trip rates and traffic forecasts will be generated. The impact on the strategic highway network has been assessed for each individual strategic development site, along with the cumulative impact of all strategic development sites.

Recommendations for improvements to the highway network and sustainable transport network have been made for each strategic development site.

The strategic development sites and the strategic highway network have been defined by RCT and both are to be included in the RCT Local Development Plan, which is currently being developed to a Deposit Draft Stage. These are illustrated on the plan below.

Plan illustrating the RCT strategic sites and strategic highway network



The eight RCT strategic development sites are:

1. Former Maerdy Colliery Site (size – 40ha);
2. Former Fernhill Colliery Site, Blaenrhondda (size – 40ha);
3. Former Phurnacite Plant, Abercwmboi (size – 58 ha);
4. Robertstown/Abernant (size – 28ha);
5. Land South of Hirwaun/Penywaun (size – 225ha);
6. Former Cwm Colliery and Coking Works, Beddau (size – 84ha);
7. Mwyndy/Talbot Green Area (size – 352ha);
8. Former Llanilid Open Cast Colliery, Llanharan (size – 409ha).

2.4 Report structure

This Strategic Transport Assessment is structured as follows:

- Section Three reviews the available traffic survey data and presents the methodology for setting a future year baseline strategic highway network traffic flow;
- Section Four details the methodology for assessing the impact on the strategic highway network resulting from the traffic generation associated with the proposed redevelopment of the strategic development sites;
- Section Five Assesses the strategic highway network under baseline traffic loading in 2025;
- Section Six assesses the impact on the strategic highway network from the traffic generation associated with the redevelopment of each individual strategic development site;
- Section Seven assesses the cumulative impact on the strategic highway network from the traffic generation associated with redevelopment of all of the strategic development sites;
- Section Eight presents options for funding mechanism through which RCT should secure future developer contributions for transport infrastructure improvements.
- Section Nine presents the conclusions of this report.

3 Review of Traffic Survey Data

3.1 Introduction

This section reviews the sources of the traffic survey data that has been made available by RCT, GEC and other Local Authorities for use within this Strategic Transport Assessment. The section also details the methodology used to 'growth' the traffic survey data so that a baseline traffic flow for the strategic highway network can be devised for future year scenarios.

3.2 Rhondda Cynon Taf

The Local Authority does not currently hold any traffic flow information pertaining to the strategic roads that lie within the county boundary and perusal of recent Transport Assessments submitted to RCT with previous planning applications revealed little in the way of useful traffic flow data for the purposes of this Strategic Transport Assessment. The only useful data was extracted from the Parc Eirin (Tonyrefail) Transport Assessment which was compiled by Ove Arup & Partners Ltd in January 2006. Base traffic flow data has been extracted and utilised as part of this assessment. **Table 3.1** lists the traffic survey sites used and the date on which the surveys were conducted. The traffic data is provided as peak hour, directional flows only.

Location	Survey Date
A4119 Tonyrefail Bypass south	January 2004
A4119 Tonyrefail Bypass north	January 2004
A4119 Ely Valley link road	June 2005
A4093 Hendreforgan link road	January 2004
A4093 West of Tonyrefail	June 2004

3.3 Glamorgan Engineering Consultancy

RCT County Borough Council were however able to supply traffic survey data through Glamorgan Engineering Consultancy (GEC). The sites are detailed in **Table 3.2**. The traffic surveys supplied by GEC are in an hourly, directional format and were conducted over a 12hr period (07:00-19:00).

The GEC surveys were conducted between 2002 and 2007, with the exception of the A4059, Pontpren – Penderyn survey, which was conducted in the year 2000. As this data is 7 years old, we would not normally consider it to be representative of current traffic flows. However,

as this road links Hirwaun and the Brecon Beacons and limited development has taken place along its length over this period, the data is considered appropriate for use (subject to the application of the appropriate growth factors).

Table 3.2 – Survey sites provided by GEC	
Location	Survey Date
A4059, Pontpren – Penderyn	28/06/2000
A465 Hirwaun to Glynneath	19/03/2007
A4061, Rhigos Road	24/06/2005
A465 (east rbt to west rbt)	29/09/2004
A4059, Aberdare By-Pass (North)	11/05/2006
A4233, Maerdy Road	21/06/2006
A4059, Aberdare By-Pass (South)	15/09/2006
A4061, Ynyswen Road, Treherbert	29/09/2006
A4233, East Road, Tylorstown	27/04/2007
A4059, New Road, Mountain Ash	31/03/2006
AA73, Main Road, Church Village	15/03/2002
A473, Llantrisant Road, Llantrisant	18/10/2002
A4119/A473 Roundabout	22/05/2002
A4119, Llantrisant Road, Mwyndy	19/10/2005
A473, Talbot Green By-Pass	13/05/2003
A473, Bridgend Road, Llanharan	28/06/2006
A473, Penybont Rd, Pencoed	30/06/2004

3.4 South Wales Trunk Road Agency

The South Wales Trunk Road Agency (SWTRA) was contacted to establish whether they were in possession of any traffic flow data for the Trunk Roads in RCT. SWTRA stated that they do not hold any traffic flow data for any of their Trunk Roads.

3.5 Welsh Assembly Government

The Welsh Assembly Government (WAG) was able to supply traffic flow data for the M4 Motorway, A465, A470 and A4232 Trunk Roads. The survey data is in an hourly (24hr period) directional format that is based on a yearly average (1st January – 31st December 2006) and, as such, represents the most recent data available for these roads. The survey sites are summarised in **Table 3.3**.

Table 3.3 – Survey sites provided by WAG	
Location	Survey Date
A470 Coryton	2006 (Avg.)
A470 Nantgarw	2006 (Avg.)
A470 Upper Boat	2006 (Avg.)
A470 Glyntaff	2006 (Avg.)
A470 South of Abercynon	2006 (Avg.)
A470 North of Abercynon	2006 (Avg.)
A470 Pentrebach to Rhydycar	2006 (Avg.)
A470 Rhydycar to Swansea Road	2006 (Avg.)
A470 Swansea Road to A465	2006 (Avg.)
A465 Merthyr to Hirwaun	2006 (Avg.)
A465 Glyneath Bypass	2006 (Avg.)
A465 North of Resolven	2006 (Avg.)
A465 North of Aberdulais	2006 (Avg.)
A465 South of Aberdulais	2006 (Avg.)
A465 north of Llandarcy	2006 (Avg.)
M4 J30 – J32	2006 (Avg.)
M4 J32 – J33	2006 (Avg.)
M4 J33 – J34	2006 (Avg.)
M4 J34 – J35	2006 (Avg.)
A4232 Capel Llaniltern	2006 (Avg.)

3.6 Neighbouring Local Authority Traffic Survey Data

Relevant traffic survey data has also been acquired from neighbouring local authorities including Bridgend County Borough Council and Caerphilly County Borough Council. The surveys supplied are summarised in **Table 3.4**.

Table 3.4 – Other Local Authorities survey sites	
Location	Survey Date
A4093 Gilfach Goch (Bridgend CBC)	May 2007 (Avg.)
A468 Nantgarw Hill	March 2007 (Avg.)

Average directional peak hourly flows have been calculated for the A4093 where the traffic flow was surveyed during the month of May 2007, and the A468 where the traffic flow was surveyed in the month of March 2007.

3.7 Traffic survey summary

The type of traffic data that has been made available for use in this Strategic Transport Assessment varies in survey time, period and age. This report assesses the strategic overview of the RCT's highway network and therefore all survey information supplied is considered appropriate for use. The three different types of survey information that has been provided include:

- 12hr survey taken over one day
- 24hr survey taken over one month
- 24hr survey taken over one year

These surveys have been normalised for consistency using the following methodology.

3.8 Growth Factors

The earliest anticipated year of opening for any of the strategic development sites is considered to be 2010. This is due to the large scale land remediation and ground works required before development can commence. This assessment will therefore test the impact that the development sites will have on the strategic network 15 years after the anticipated year of opening, i.e. 2025.

The growth rates associated with the base traffic surveys to 15 years after the anticipated year of opening have been derived from National Road Traffic Forecast (NRTF) data which has been adjusted in accordance with the National Trip End Mode (NTEM), obtained from the computer software TEMPRO. The calculated growth rates are illustrated below in **Table 3.5**. Details of the NRTF / TEMPRO calculations can be found in **Appendix A**. The calculations were based on the input data as follows:

- Geographical area – Rhondda Cynon Taf
- Time period – AM and PM peak periods
- Only car drivers to be considered

Table 3.5 – TEMPRO growth rates		
Growth Years	AM	PM
2000 – 2025	1.384	1.385
2002 – 2025	1.337	1.336
2003 – 2025	1.314	1.313
2004 – 2025	1.293	1.293
2005 – 2025	1.272	1.271
2006 – 2025	1.251	1.249
2007 – 2025	1.236	1.234

4 Highway Impact Methodology

4.1 Methodology

This Transport Assessment has assessed the impact of the strategic development sites on RCT's strategic highway network in two ways:

1. Assess the individual impact of each strategic development site on the strategic highway network as a percentage of the baseline traffic flow, per link and per direction; and
2. Assess the cumulative impact on the strategic highway network in terms of total actual traffic flows and the capacity levels of the carriageways, per link and per direction.

This assessment has considered the capacity of each of the highway links and not the capacity of individual junctions. Only peak hour flows have been considered and not Annual Average Daily Totals (AADT), as we consider the peak hour loading to be the overwhelming issue on the RCT strategic highway network, rather than the amount of total daily traffic. This Strategic Transport Assessment has therefore used the carriageway capacity calculations that are found in the Design Manual for Roads and Bridges (DMRB) TA 79/99 and not TA 46/97. Standard, TA 46/97 is based on rural roads and, as such, concentrates on AADT calculations, whereas TA79/99 considers urban roads and, as such, concentrates on peak hour flow calculations. RCT's strategic network is more accurately represented by the urban road characteristics and calculations and these will therefore be utilised in this Strategic Transport Assessment.

The capacity of a carriageway is dependent on many factors, including Road Type, Road Quality, Number of Lanes and Carriageway Width. It has been assumed that as all of the highways under consideration in this assessment form part of the 'strategic' highway network, that they should all be considered as either a road type UAP1 UAP2 or UM.

The road type UAP1 is defined in TA 79/99 as a '*high standard single/dual carriageway road carrying predominantly through traffic with limited access*'.

The road type UAP2 is defined in TA 79/99 as a '*good standard single/dual carriageway road with frontage access and more than two side roads per km*'.

The road type UM is defined in TA 79/99 as a '*through route with grade separated junctions, hardshoulders or hardstrips, and motorway restrictions*'.

The capacities of different road types, as calculated in TA 79/99, are contained within **Table 4.1**.

Table 4.1 – Carriageway capacities per direction, as calculated in TA 79/99

		Two-way Single Carriageway–Busiest Directional Flow								Dual Carriageway			
		Total Number of Lanes								No. of Lanes in Each Direction			
		2				2-3	3	3-4	4	2		3	4
Carriageway Width		6.1m	6.75m	7.3m	9.0m	10.0m	12.3m	13.5m	14.6m	6.75m	7.3m	11.0m	14.6m
Road Type	UM	-	-	-	-	-	-	-	-	-	4000	5600	7200
	UAP1	1020	1320	1590	1860	2010	2550	2800	3050	3350	3600	5200	-
	UAP2	1020	1260	1470	1550	1650	1700	1900	2100	2950	3200	4800	-
	UAP3	900	1110	1300	1530	1620	-	-	-	2300	2600	3300	-
	UAP4	750	900	1140	1320	1410	-	-	-	-	-	-	-

Each of the roads in the strategic highway network have therefore been assigned capacity levels according to the criteria in TA 79/99, which is summarised in **Table 4.2**.

Table 4.2 – RCT Strategic highway network capacities by road type

Road	Total no. of Lanes	Road Type	Capacity per Direction
A465 Hirwaun to Merthyr	2-3	UAP1	2010
A465 Hirwaun to Neath	4	UAP1	3600
A468	4	UAP1	3600
A470	4	UAP1	3600
A473	2	UAP2	1470
A4059	2	UAP2	1470
A4061	2	UAP2	1470
A4093	2	UAP2	1470
A4119 between M4 and Llantrisant	4	UAP1	3600
A4119 between Llantrisant and Tonypany	2	UAP1	1590
A4222	2	UAP2	1470
A4232	4	UAP1	3600
A4233	2	UAP	1470
M4	6	UM	5600

The A4233 and A4061 have been classified as road type UAP2 due to the horizontal and vertical characteristics which we believe reduces both vehicular speeds and capacity.

4.2 Committed Developments

To isolate the impact on the highway network arising from the development at each of the strategic site, committed development has not been considered as part of this approach. In reality there are many committed developments across the borough that will impact upon the RCT strategic highway network. However, if the traffic generation from these committed developments were to be added to the capacity assessment, then this will only serve to increase the baseline traffic flow thereby reducing the calculated percentage impact of the strategic development site traffic. Therefore this Transport Assessment represents a worst case scenario.

4.3 Traffic Generation

Residential trip rates have been taken from the Llanilid Residential Development Transport Assessment which was compiled by Ove Arup & Partners Ltd in August 2005. This Transport Assessment forms part of one of the strategic sites and is similar in size to the proposed residential redevelopments at each of the other strategic sites. They are also slightly higher than those obtained from TRICS, so are considered appropriate for use. Moreover, these trip rates represent a worst case scenario as they reflect privately owned housing with no provision for a social housing element. Social housing generally has lower trip rates than privately owned housing, especially during the peak hours. The Arup trip rates are summarised below in **Table 4.3**.

Table 4.3 – Ove Arup residential trip rates

Land Use	Period	Arrivals	Departures	Two-way
Residential	AM	0.147	0.646	0.793
	PM	0.546	0.237	0.783

Traffic generation for each of the remaining development uses has been calculated by obtaining trip rates from the Trip Rate Information Computer System (TRICS) v.2007b database. The trips rates for the assumed development mixes have been calculated based on discussions with RCT. The exact development mixes are described in more detail in the following Section. The general factors chosen for the TRICS exercise are listed below:

- Weekday surveys only
- Busiest surveys only
- England and Wales survey locations only
- Average rates used, not 85th percentile

More detailed information pertaining to the sites chosen are included in **Appendix B** of this report.

The trip rates are summarised below, per 100m² of each development type, in **Table 4.4**.

Table 4.4 – TRICS generated trip rates (per 100m ²)				
Land Use	Period	Arrivals	Departures	Two-way
Retail Park	AM	0.539	0.265	0.804
	PM	1.224	1.339	2.563
Commercial (supermarket)	AM	3.990	2.434	6.424
	PM	7.041	7.281	14.322
Leisure (centre)	AM	0.566	0.478	1.044
	PM	1.263	1.097	2.360
Leisure (cinema)	AM	0.000	0.000	0.000
	PM	2.394	2.274	4.668
Leisure (bowling)	AM	0.000	0.000	0.000
	PM	0.600	0.600	1.200
Employment (business park)	AM	1.037	0.146	1.183
	PM	0.125	0.852	0.977
Employment (industrial estate)	AM	0.513	0.213	0.726
	PM	0.140	0.458	0.598
Community - School	AM	1.724	1.043	2.767
	PM	0.255	0.380	0.635

Traffic generation data for the proposed film studios development at the Llanilid OCC strategic site has been taken from the Varyards Transport Assessment (June 2002) and is summarised in **Table 4.5**.

Table 4.5 – Llanilid film studio traffic generation				
Land Use	Period	Arrivals	Departures	Two-way
Film Studios	AM	1989	357	2346
	PM	391	1925	2316

4.4 Offsetting

No offsetting of existing planning consents or previous land uses has been factored into this highway capacity assessment. 'Offsetting' subtracts traffic that could be generated by the development site under its existing planning consent or brownfield land use from the predicted traffic generated by the proposed redevelopment. Whilst this is an accepted method of analysing development traffic impact, this report does not unduly 'offset' any previous or current use traffic generations, thereby assuming a worst case scenario.

4.5 Discounted trips

This assessment has not discounted any of the trip rates to account for linked trips that may occur within a site. As all of the sites are mixed-use developments, it is likely that many of the trips will be linked to each other as visitors are likely to utilise more than one facility / service per trip within the site. For example, this would apply at sites where retail and leisure uses are proposed alongside each other.

There has also been no reduction in trip rates to account for internal trips. Internal trips are when trips stay within the development site and do not travel on any of the strategic highway network. An example of this would be where residential and business uses were proposed on the same site. It is conceivable that some residents may work at the business on the development site and therefore would not need to leave the site to get to work.

These trip discounting methods have not been taken into account within this capacity assessment, so we have considered the absolute worst case scenario possible for the redevelopment of the strategic development sites.

4.6 Local highway network

It has been assumed that all traffic generated by the redevelopment of the strategic development sites will only use the RCT strategic highway network. This assigns all of the development borne traffic on to the strategic network and therefore represents a worst case scenario. This is unlikely to happen in reality as some of the traffic, especially traffic originating from or travelling to local settlements, will utilise minor roads that do not form part of the strategic highway network.

4.7 New roads

For the purposes of this strategic highway network capacity assessment, it has been assumed that no new strategic roads will be built in the borough within the assessment years. By-passes and road upgrades that are currently under consideration are summarised and the impacts considered at each of the individual strategic sites. However they have not been

included within the capacity assessment as they may not be constructed within this Strategic Transport Assessment timeframe.

4.8 Key junctions

Whilst capacity analysis testing at individual junctions is not part of the scope of this capacity assessment, consideration has been given to the key junctions on the strategic highway network that are likely to experience significant impact from development traffic. These key junctions have been identified so that further studies can be undertaken to identify appropriate remedial works to ameliorate any impact from development borne traffic.

4.9 Gravity Model

Development traffic distributions have been based on a regional gravity model for the RCT area and adjoining local authorities. The gravity model, for the purposes of this study, is based on the population density (derived from 2001 Census data) for principal towns/ growth areas and key settlements/ growth areas as identified in the RCT Local Development Plan and the distance between key/ growth settlements. It has also been necessary to include settlements in adjoining local authorities in order to produce a robust model and to account for key attractors outside of RCT.

It should be noted that both the population of the ward of the attraction and of any adjoining wards that were still part of the same urban mass e.g. Talbot Green and Llantrisant Town wards were counted as one large population draw / attraction.

The key internal attractors within RCT are:

- | | |
|----------------|--------------|
| ■ Aberdare | ■ Pontypridd |
| ■ Ferndale | ■ Porth |
| ■ Hirwaun | ■ Tonypany |
| ■ Llanharan | ■ Tonyrefail |
| ■ Llantrisant | ■ Treorchy |
| ■ Mountain Ash | |

The key external attractors adjoining RCT include:

- | | |
|--------------|-------------------------------|
| ■ Bridgend | ■ Merthyr Tydfil |
| ■ Caerphilly | ■ Powys (Llandridnodd Wells) |
| ■ Cardiff | ■ Vale of Glamorgan (Penarth) |
| ■ Neath | |

The gravity model enables forecast development traffic to be distributed on the identified strategic highway network, through calculating the attraction of destinations relative to their size (population) and distance from each of the eight proposed strategic development sites as shown in **Figure 4.1**. The assumptions made within the gravity model, have been partially validated to a certain extent (due to the limitations in the Census journey to

work data identifying destinations of trips made) to further justify the modelling assumptions used within this study.

Figure 4.1 – Gravity Model Calculations

$$\text{Gravity Weighting} = \frac{\text{Population}}{(\text{Distance between attraction and site})^2}$$

In order to avoid unnecessarily skewing the gravitational calculations it has been necessary to restrict the minimum distance between the attractor and the strategic sites to a distance of 2km. The distances between the attractors and the strategic sites have been calculated using the assumption that only the strategic road network would be used. The distances to/from the attractors and the strategic sites have been calculated to the centre point to each of the attractors (as detailed above) with all traffic assumed to take the fastest route (calculated using route mapping software). **Table 4.6** shows an example of the gravity calculations for the former Maerdy Colliery Site (strategic site Ref 1). It demonstrates that 23.3% of the traffic generation will be assigned to the A4233 (south to Ferndale).

Table 4.6 – Example of Gravity Model Calculations

Site 1	Former Maerdy Colliery Site	Maerdy			
Ward	2001 Population	Distance from Site (miles)	Distance from Site (km)	Gravity Calculation	Gravity %
Aberdare West/Llwydcoed	15,837	4.9	7.9	254.7	11.3%
Ferndale	7,853	2.4	3.9	526.4	23.3%
Hirwaun	7,323	4.9	7.9	117.8	5.2%
Llanharan	3,411	15.8	25.4	5.3	0.2%
Llantrisant Town	6,657	15.1	24.3	11.3	0.5%
Mountain Ash West	7,036	8.8	14.2	35.1	1.6%
Pontypridd Town	39,251	9.9	15.9	154.6	6.8%
Porth	5,941	7	11.3	46.8	2.1%
Tonypandy	12,822	8.2	13.2	73.6	3.3%
Tonyrefail East	11,050	10	16.1	42.7	1.9%
Treorchy	25,882	8.2	13.2	148.6	6.6%
Bridgend	128,649	22.6	36.4	97.3	4.3%
Caerphilly	169,536	17.4	28.0	216.2	9.6%
Cardiff	305,347	21.9	35.2	245.8	10.9%
Merthyr Tydfil	55,984	13.2	21.2	124.1	5.5%
Neath Port Talbot	134,467	24.7	39.7	85.1	3.8%
Powys	126,347	53.4	85.9	17.1	0.8%
Vale of Glamorgan	119,304	28	45.1	58.8	2.6%
Total Population	1,182,697	276	445	2,261	1

The traffic was then assigned throughout the strategic highway network depending on the gravitational calculations of the attractor. In order to calculate the inbound movements from the attractors to the strategic sites the calculations were reversed. This process was then repeated for each



individual development site and for both AM and PM peak periods assessed.

Having assigned the development traffic to the strategic highway network based on the gravity model calculations for each of the eight strategic sites, for both AM and PM peaks periods, the figures have then been used to highlight the forecast impact of the strategic site development traffic on the strategic road network of Rhondda Cynon Taff.

It should be noted that the gravity model acts as a valid proxy to traffic distribution based on the above assumptions and has been used as alternative data i.e. origin/ Destination data is available for RCT.

5 Baseline Traffic Assessment

5.1 Baseline Traffic

It is necessary to assess the RCT strategic highway network under 2025 baseline traffic loading so that a fair comparison can be made between the loading of 2025 baseline and development flows. These forecast flows are detailed in the following section, but will include the traffic generated by the redevelopment of the RCT strategic development sites.

Table 5.1 summarises the maximum 2025 baseline traffic flows on each strategic route, compared to the theoretical capacity per direction, as predicted in TA 79/99. The A465 and A4119 have been split into two sections each due to the different road sections having a variation in the number of lanes provided.

The cells that are highlighted in red indicate roads, or sections of road, that are operating at less than 5% capacity or over capacity. They will require remedial measures to provide new or upgraded highways to accommodate the additional traffic, or that require measures to significantly reduce the level of traffic.

Cells that are highlighted in orange indicate roads, or sections of road, that have less than 20% capacity remaining. It is likely that they will require some remedial measures at major junctions and at 'bottle necks' to ensure traffic flows remain as efficient as possible on these links.

Table 5.1 demonstrates that in 2025, under baseline traffic loading, the A470 is forecast to operate over its theoretical capacity during both directions and in both peak periods.

The A4119 is shown to be operating over capacity in the PM peak hour, northbound only, though it will be approaching capacity in the AM peak southbound.

The M4 motorway is demonstrated to be operating beyond its capacity level in the AM peak eastbound and the PM peak westbound. This trend is concurrent with existing travel patterns of commuters travelling to Cardiff in the morning and leaving Cardiff in the evening.

Other highway links that are approaching or are over capacity are the A4059, A473 and A4232. The respective traffic flows / volumes on these links highlight the existing commuter patterns, as many of the link flows are tidal. i.e. in one direction in the AM peak and in the opposite direction in the PM peak period.

In summary, this capacity assessment predicts that with forecast levels of background traffic growth that many of the strategic highways in the RCT network will be operating over capacity in 2025, with many more quickly approaching their capacity. Therefore any form of development traffic generation will compound these issues and worsen congestion.

Improvement / mitigation measures will therefore be required to manage future traffic flows, as the existing highways will not be able to meet the predicted demand.

Table 5.1 – RCT Strategic highway capacity by road type (Base 2025)					
Road	Total No. of Lanes	Road Type	Capacity as per TA 79/99	Predicted 2025 Base Flows	
				AM	PM
A465 Hirwaun to Merthyr	2-3	UAP1	2010	1117 (E)	1097 (E)
				1146 (W)	1160 (W)
A465 Hirwaun to Neath	4	UAP1	3600	960 (E)	970 (E)
				895 (W)	1028 (W)
A468	4	UAP1	3600	2130 (E)	2163 (E)
				2061 (W)	2234 (W)
A470	4	UAP1	3600	4310 (N)	4543 (N)
				3716 (S)	3745 (S)
A473	2	UAP2	1470	1048 (E)	1448 (E)
				1340 (W)	1142 (W)
A4059	2	UAP2	1470	1131 (N)	1228 (N)
				1194 (S)	1215 (S)
A4061	2	UAP2	1470	493 (N)	641 (N)
				576 (S)	535 (S)
A4093	2	UAP2	1470	260 (E)	449 (E)
				308 (W)	302 (W)
A4119 (Section between M4 and Llantrisant)	4	UAP1	3600	2027 (N)	2411 (N)
				2156 (S)	2129 (S)
A4119 (Section between Llantrisant and Tonypany)	2	UAP1	1590	907 (N)	1618 (N)
				1339 (S)	856 (S)
A4232	4	UAP1	3600	2622 (N)	3731 (N)
				3696 (S)	2727 (S)
A4233	2	UAP2	1470	445 (N)	561 (N)
				543 (S)	507 (S)
M4	6	UM	5600	6283 (E)	4585 (E)
				4937 (W)	6488 (W)

Note: TA 79/99 Capacity is shown per direction

Figures 5.1 and 5.2 illustrate the forecast background traffic in 2025, in the AM and PM peak periods respectively.

6 Individual Strategic Development Site Impact

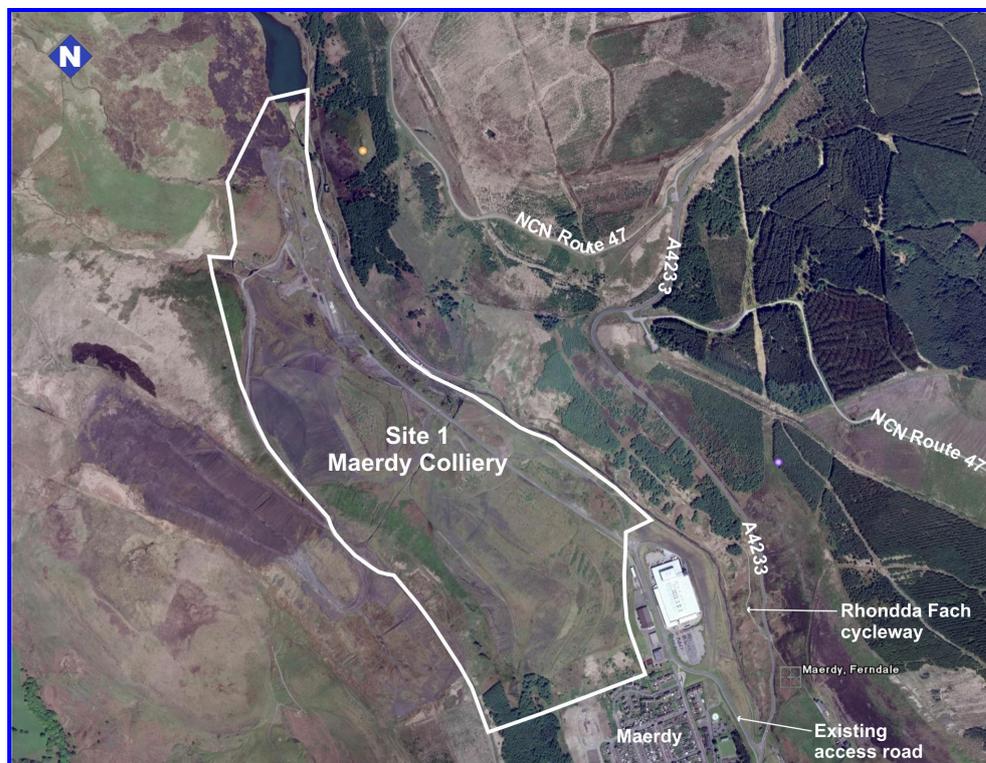
6.1 Site 1 – Former Maerdy Colliery Site, Rhondda Fach

6.1.1 Site Location and Description

The Maerdy Colliery Strategic Development Site is located on the northern periphery of the village of Maerdy in the Rhondda Valley. The site is approximately 40 hectares in size and is bounded to the north by the valley side, to the east by the A4233, to the south by the residential area of Maerdy and to the west by another valley side.

The Maerdy colliery was formerly located on this site and was utilised for the extraction of coal from deep mines. Although most of the colliery infrastructure has now been removed, the current topography reflects the site's previous use with steep slopes and uneven land. It is considered essential that major ground works and land reclamation will be required before future development can commence.

An aerial photograph depicting the development site, its surrounding area and local transport facilities is illustrated below.



6.1.2 Local Highway Network and Existing Site Access

Existing vehicular access to the site is gained from an industrial estate road that connects to the A4233 via a priority T-junction. The existing T-junction has large radii compound curves that have been designed to facilitate large articulated heavy goods vehicles arriving/leaving in either direction on the A4233. The T-junction also has good visibility with over a 100m splay in either direction.

The A4233 is a single-lane carriageway that connects the local area with Aberdare to the north and Porth and Pontypridd to the south. It also forms part of the RCT strategic road network.

6.1.3 Local Highway Improvement Schemes

The Lower Rhondda Fach Relief Road scheme has recently been completed, allowing a more direct flow of traffic through the Lower Rhondda Valley, thereby removing much of the congestion from the local villages. The Local Authority continues to promote the Upper section of the Rhondda Fach Relief Road which will continue up the valley towards Maerdy, although funding has yet to be secured for this second stage of infrastructure improvements.

If funding was secured in the future then the construction of this relief road extension would provide an improved access to the upper Rhondda Valley for both commuters and businesses, making the Maerdy Colliery site more attractive for development. The improved carriageway could provide more capacity and a more direct and unrestricted route through the valley for vehicles.

6.1.4 Future Site Redevelopment

It is necessary to establish the potential level of development so that traffic generation can be forecast. Potential exists for this site to be redeveloped for large scale employment, tourism and leisure uses. There are currently some local employment buildings located directly to the south of the site and future development of large scale industrial estate type employment could be seen as a continuation of existing land use. The development of the site for leisure and tourism uses could also provide welcome amenities to this area of the Rhondda

This development site has considerable topographical constraints that will limit the amount of developable area, even with extensive land reclamation. Therefore it is assumed that only 30% of the total site area will be viable for future development, which equates to approximately 12 hectares of developable area. The Gross Floor Area (GFA) of buildings generally equates to 40% of the developable area for employment and leisure uses. As such, a GFA of 40% has been used in this assessment to calculate the developable area on this site. Residential development has been calculated at an average density of 40 dwellings per hectare.

To this end, it has been assumed for the purposes of this assessment that the level of future redevelopment at the site could include 35,000 m² of employment and 13,000 m² of leisure facilities.

6.1.5 Trip Generation

Table 6.1 illustrates the trip rates (derived from TRICS) that could occur at the development site during the AM and PM highway peak hours.

Table 6.1 – Maerdy colliery trip rates				
Land Use	Period	Arrivals	Departures	Two-way
Employment Ind. Est.	AM	0.513	0.213	0.726
	PM	0.140	0.458	0.598
Leisure Centre	AM	0.566	0.478	1.044
	PM	1.263	1.097	2.360

Table 6.2 illustrates the traffic generation that would occur at the site as a result of the proposed development during the AM and PM highway peak hours, as predicted by TRICS. These figures are based on the development of 35,000 m² of employment and 13,000 m² of leisure on the site.

Table 6.2 – Maerdy colliery traffic generation				
Land Use	Period	Arrivals	Departures	Two-way
Employment Ind. Est.	AM	180	75	255
	PM	49	160	209
Leisure Centre	AM	74	62	136
	PM	164	143	307
Total	AM	254	137	391
	PM	213	303	516

6.1.6 Strategic Highway Network Assessment

The gravity model has been used to calculate the impact of forecast traffic on the strategic highway network, resulting from the redevelopment of the Maerdy Colliery strategic development site. **Figures 6.1** and **6.2** illustrate the AM and PM development traffic distribution, **Figures 6.3** and **6.4** illustrate the highway network traffic volumes and **Figures 6.5** and **6.6** illustrate the AM and PM development traffic percentage impact on the strategic highway network. The road most likely to be affected by the

proposed redevelopment would be the A4233. The impact on the A4233 to the north (Aberdare) is not considered to be an issue as it is a relatively underused section of road that traverses the valley. There may however be road safety and maintenance issues that need to be addressed due to this increase in traffic on this section of road. The impact on the southern section of the A4233 (Porth) is likely to be more critical to congestion levels as it carries significantly higher existing volume of traffic than the northern section of the A4233.

The percentage impact on this road from the development varies between 17-41% in the AM and 26-43% in the PM peak hour, which represents a medium to high level of growth on this part of the strategic road network. This predicted level of growth, whilst significant, is unlikely to cause any capacity issues on the strategic road network. The percentage increases from the development on all other strategic roads is generally less than 4% during both the AM and PM peak hours; and is therefore not considered to be an issue. However, further studies will need to be undertaken to assess the impact that this increase in traffic could have on all of the key local and strategic road junctions.

Table 6.3 summarises the highway links most affected by the 2025 baseline traffic flows with the addition of the Maerdy Colliery development traffic and compares them to the theoretical capacity of the link. The cells highlighted in red indicate links that will be operating with less than 5% capacity, or over capacity. Whilst cells highlighted in orange indicate links that will be operating with less than 20% capacity remaining.

Table 6.3 – Maerdy colliery forecast traffic volumes					
Road	Total No. of Lanes	Road Type	Capacity as per TA 79/99	Predicted 2025 Base + Development Flows	
				AM	PM
A4233	2	UAP2	1470	628 (N)	714 (N)
				641 (S)	725 (S)

Note: TA 79/99 Capacity is shown per direction

Table 6.3 demonstrates that although the development traffic generated by the Maerdy Colliery site is forecast to have a medium to high percentage impact on the A4233, the (base + development) traffic flows are actually less than half the theoretical capacity of this type of highway. It is therefore suggested that no significant highway link improvements are considered necessary as part of the redevelopment of this site, although further studies into the operational performance of key junctions may be required.

6.1.7 Proposed Site Access

It is considered that the primary point of access for this site will be from the existing industrial estate road that connects to the A4233 via a priority T-junction.

Secondary access points connecting through Wrgant Place and Springfield Road would allow for a continuation of the existing community rather than lead to the creation of a segregated development. Future developments should, as a minimum, provide a good cycle and pedestrian friendly environment along these access routes so that local residents will be encouraged to travel to the site by sustainable means.

6.1.8 Key Junctions

As stated in the methodology section, junction capacity analysis was not within the scope of this capacity assessment. However, the key junctions that may be adversely affected by the traffic generated by the development site include:

- A4233 / A4059 roundabout
- A4233 Station Road / Maerdy road crossroads junction
- A4058 Sardis Road roundabout
- A4223 / A470 roundabout (grade separated)
- A4119 / A473 roundabout
- Junction 34 M4 motorway (grade separated)

These should be tested in terms of their operational capacity in future studies.

6.1.9 Sustainable Transport Assessment

Bus Service Provision

An hourly bus service (No.172) is currently operated by Stagecoach and links Maerdy with Aberdare in the north and Bridgend in the south. The nearest existing stop to the development site is located on Wrgant Place, approximately 400m from the site which is within the desirable walking distance recommended by the Institute of Highways and Transportation (IHT). There is a shelter, timetable and bus turning facility.

This service could be improved to serve the strategic development site by increasing it to a half-hourly service, possibly only during peak hours, with a new bus-stop located within the development site for easier access. This could reduce car-dependency in this area and increase modal shift, thereby reducing the impact of the development on local and strategic roads. A bus capacity assessment would need to be conducted in order to establish whether the existing capacity provision will meet the predicted demand from the future development.

In order to promote sustainable travel, the process of 'pump priming' should be introduced prior to any new redevelopment occurring within the site. Bus services should be introduced prior to any occupation begins, so that people travelling to or from the site have a choice of travel mode from day one and before travel habits / patterns emerge.

Rail Service Provision

There are no rail services from Maerdy, however a railbus (Service No. RL2) is operated by Arriva Cymru between Ystrad Rhondda station and Maerdy. This service could easily be extended to encompass the development site. The Treherbert to Cardiff rail service operates from the Ystrad Rhondda station and this transport link offers a sustainable and commutable travel option to the development site. The operation of this needs further consideration, but could form part of the pump priming initiative.

Provision for Pedestrians and Cyclists

Footways are present on both sides of A4233 Station Road carriageway that passes through Maerdy, with dropped kerbs generally in place where required. The footway network through Maerdy does vary in width and quality however it does benefit from street lighting.

The level of cycle infrastructure provision within the local area is considered to be good. The Rhondda Fach is a mostly 'off-road' footway/cycleway that follows the alignment of a disused railway which links the development site to Ferndale, Porth and Pontypridd. This cycleway has generally been constructed of asphalt along its off-road sections and uses good quality, quiet roads in between these sections. This promotes sustainable travel in the local area which should be further enhanced by any redevelopment of this site as described in the pump priming process above.

A National Cycle Network traffic-free route (no. 47) is located approximately 1.5km east of the site at the top of the valley. It is worth noting that the topographical constraints are likely to act as barrier to the integration of cycle linkages from the proposed development site to the existing cycle network. It is considered to be a leisure cycle facility only rather than a commuting link and this would relate to the leisure and tourism uses proposed for this development site.

6.1.10 Summary

- Any future redevelopment of the site should ensure that the site is an extension of the existing urban settlement and not segregated by any physical boundaries. Integration with the existing urban settlement will ease accessibility and encourage sustainable transport use, thereby reducing demand on the RCT strategic highway network.
- The capacity assessment of the key links has demonstrated that forecast traffic generation from this site will not have a detrimental impact on the RCT strategic highway network and will not require any

highway link upgrade to manage the additional traffic. Further studies will be required to ascertain whether the additional traffic will impact upon the operational performance of the key junctions on the strategic highway network

- A comprehensive Masterplan must be devised at an early stage of this site's redevelopment design process to maximise accessibility by all modes of transport.
- A Travel Plan should be agreed prior to first occupation of the redevelopment.
- Consideration should be given to 'pump priming' prior to first occupation.

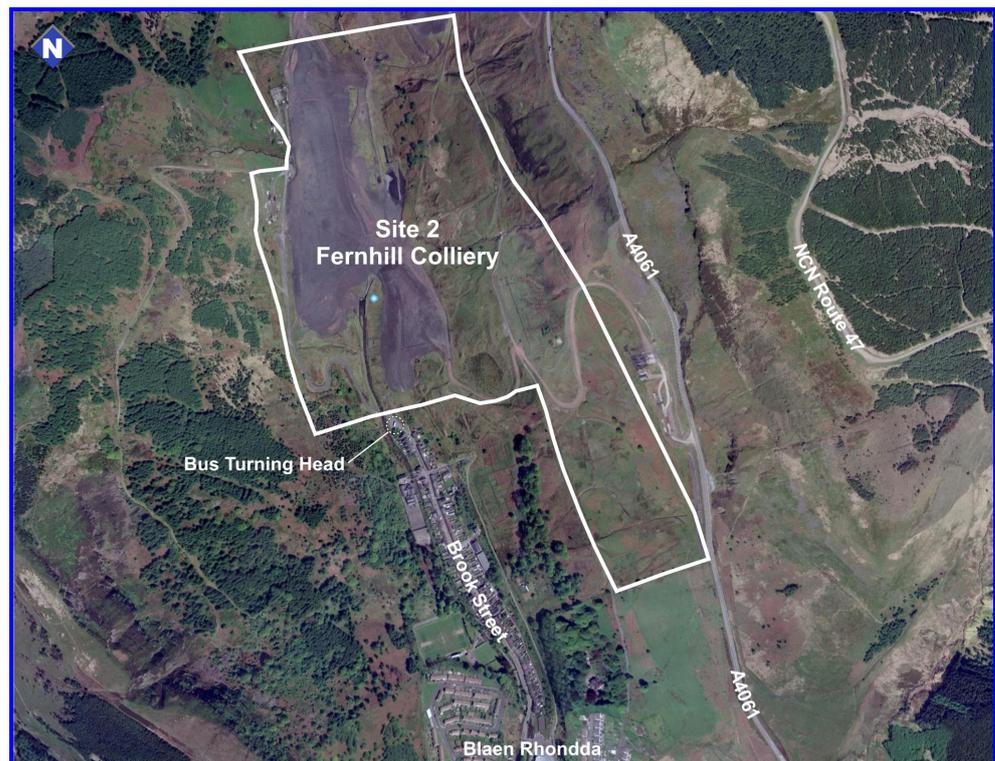
6.2 Site 2 – Former Fernhill Colliery Site, Blaenrhondda

6.2.1 Site Location and Description

The Fernhill Colliery Strategic Development Site is located on the northern periphery of the village of Tynewydd in the Blaenrhondda Valley. The site is approximately 40 hectares in size and is bounded to the north by the valley side, to the east by the A4061, to the south by the residential area of Tynewydd; and to the west by another valley side.

The Fernhill colliery was formerly located on this site and was utilised for the extraction of coal from deep mines. Although most of the colliery infrastructure has now been removed, the current topography reflects the site's previous use. Whilst it is apparent that some ground works and site remediation have taken place, it is considered essential to future development that further land reclamation be carried out.

An aerial photograph depicting the development site, its surrounding area and local transport facilities is illustrated below.



6.2.2 Local Highway Network and Existing Site Access

The A4061, a single carriageway road, lies approximately 2km south of the development site and forms part of RCT's Strategic Road Network. It links the local area to Treorchy and Porth to the south and Hirwaun to the north. From Hirwaun, it is then possible to join the A465 Heads of the Valley road.

Existing access to the site is gained by an internal road that adjoins Brook Street via an informal T-junction arrangement with a bus turning head layout. Brook Street is a narrow single carriageway road that has informal on-street parking along its length, severely limiting its level of capacity / ease of traffic flows. Footways are provided along each side of the carriageway and terraced housing abuts them, on both sides. This will limit any future upgrade of this road and will limit the type and size of future development on the site if only this point of access is considered.

The A465 lies approximately 15km to the north of the development site and provides a vital link with Merthyr Tydfil and Abergavenny to the east and Neath and Swansea to the west.

6.2.3 Local Highway Improvement Schemes

The Lower Rhondda Fach Relief Road scheme has recently been completed, allowing a more direct flow of traffic through the Lower Rhondda valley and removing much of the congestion from the local villages. RCT continues to promote the Upper section of the Rhondda Fach Relief Road which will continue up the valley towards Maerdy, however funding is currently not available for this second stage.

The A465 between Merthyr Tydfil and Abergavenny has recently undergone major re-alignment and conversion to a dual two-lane carriageway. The road was previously a single-lane carriageway with a crawler lane, generally on the uphill sections. The road was considered dangerous and was operating beyond capacity in certain places during the peak hours. Planning is currently being sought for the next section of carriageway to upgrade, from Merthyr Tydfil to Hirwaun. This upgrade of the A465 will have a significant impact on the feasibility of future development in the area. The increase of road capacity in combination with less congestion and improved journey time reliability will increase the desirability of future businesses to locate in this area.

6.2.4 Future Site Redevelopment

It is necessary to establish the potential level of development so that traffic generation can be forecast. It is envisaged that the future redevelopment of this site is likely to consist of a mix of residential and leisure uses.

This development site has considerable topographical issues that will limit the size of any future development, even with extensive land reclamation. Therefore it is assumed that only 45% of the total site area will be viable for

future development, which equates to approximately 18 Hectares of developable area. The Gross Floor Area (GFA) of buildings generally equates to 40% of the developable area for leisure uses. As such, a GFA of 40% has been used in this assessment to calculate the developable area on this site. Residential development has been calculated at an average density of 40 dwellings per hectare.

To this end, it has been assumed for the purposes of this assessment that the level of future redevelopment at this site could include 600 residential dwellings and a 12,000 m² sports leisure centre.

6.2.5 Trip Generation

Table 6.4 illustrates the trip rates that could occur at the development site during the AM and PM highway peak hours, as predicted by TRICS.

Table 6.4 – Fernhill colliery trip rates				
Land Use	Period	Arrivals	Departures	Two-way
Residential	AM	0.147	0.646	0.793
	PM	0.546	0.237	0.783
Leisure Centre	AM	0.566	0.478	1.044
	PM	1.263	1.097	2.360

Table 6.5 illustrates the traffic generation that would occur at the site as a result of the proposed development during the AM and PM highway peak hours, as predicted by TRICS. These figures are base on the development of 600 residential dwellings and a 12,000 m² sports leisure centre on this site.

Table 6.5 – Fernhill colliery traffic generation				
Land Use	Period	Arrivals	Departures	Two-way
Residential	AM	88	388	476
	PM	328	142	470
Leisure Centre	AM	68	57	125
	PM	152	132	284
Total	AM	156	445	601
	PM	480	274	754

6.2.6 Strategic Highway Assessment

The gravity model has been used to calculate the impact of forecast traffic on the strategic highway network, resulting from the redevelopment of the Fernhill Colliery strategic development site. **Figures 6.7** and **6.8** illustrate the AM and PM development traffic distribution, **Figures 6.9** and **6.10** illustrate the highway network traffic volumes and **Figures 6.11** and **6.12** illustrate the AM and PM development traffic percentage impact on the strategic highway network.

The strategic road most affected by the proposed redevelopment will be the A4061. The percentage impact from the development on this road varies between 23-63% in the AM and 23-61% in the PM peak hour, which represents a medium to high level of growth on this part of the strategic road network. The impact on the A4061 to the north (Hirwaun) is not considered to be an issue as it is a relatively underused section of road that traverses the mountain. There may however be road safety and maintenance issues that need to be addressed due to this increase in traffic on this section of road. The impact on the southern section of the A4061 (Porth) is likely to be more critical to congestion levels as it carries significantly more existing traffic than the northern section of the A4061. It is envisaged that the Rhondda Relief Road will reduce the level of additional traffic from entering Porth and reduce journey times from the upper Rhondda Valley.

The percentage increases from the development on all other strategic roads are generally predicted to be less than 5% in both the AM and PM peak hours; and therefore is not considered to be a significant issue.

Table 6.6 summarises the highway links most affected by the 2025 baseline traffic flows with Fernhill Colliery development site traffic and compares them to the highways' theoretical capacity. The cells highlighted in red indicate links that will be operating with less than 5% capacity, or over capacity. Whilst cells highlighted in orange indicate links that will be operating with less than 20% capacity remaining.

Table 6.6 – Fernhill colliery forecast traffic volumes					
Road	Total No. of Lanes	Road Type	Capacity as per TA 79/99	Predicted 2025 Base Flows	
				AM	PM
A4061	2	UAP2	1470	621 (N)	1033 (N)
				940 (S)	759 (S)

Note: TA 79/99 Capacity is shown per direction

Table 6.6 demonstrates that although the Fernhill Colliery site traffic has a medium to high percentage impact on the A4061, the (base + development) traffic flows are lower than the theoretical capacity of this type of highway. The highest forecast traffic volumes, 1033 vehicles, are forecast

northbound in the PM peak hour. This is much less than the theoretical capacity of that link, which is taken to be 1470 vehicles per hour in both directions. Therefore no significant highway link improvements are considered necessary as part of the redevelopment of this site, though further studies into the operational performance of key junctions may be required.

6.2.7 Proposed Site Access

Access to the proposed development site is likely to be limited to the existing Brook Street carriageway, unless the redevelopment includes a new access road leading to the A4061. This is likely to be difficult to attain from an engineering perspective, although it could be funded by the residential development. It is recommended that further studies are conducted as it would be beneficial for the development site and local residents if an alternative access solution can be found. Brook Street has significant restrictions on traffic flow along this narrow carriageway and is adjoined by residential dwellings along its entire length.

6.2.8 Key Junctions

As stated in the methodology section, junction capacity analysis was not within the scope of this capacity assessment. However, the key junctions that may be adversely affected by the traffic generated by the development site include:

- A4061 / Hill Street priority T-junction
- A4061 / Dunraven Street priority T-junction
- A4061 / A4058 (High Street) signalised junction
- A4058 / Church Road signalised junction
- A4058 / A4119 (Princess Louise Road) Signalised junction
- A4058 Sardis Road roundabout
- A4223 / A470 roundabout (grade separated)
- A4119 / A4233 roundabout
- A4119 / A4093 roundabout
- A4119 / A473 roundabout
- Junction 34 M4 motorway (grade separated)

These should be tested in terms of their operational capacity in future studies.

6.2.9 Sustainable Transport Assessment

Bus Service Provision

A half-hourly bus service (No.120) is operated by Stagecoach and links Blaenrhondda to Tonypany and Pontypridd in the south. The nearest existing stop is located on the Blaencwm turn-around facility, approximately 20m from the development site. There is no existing shelter or timetable.

This service could be improved to serve the strategic development site by constructing a new bus-stop with modern facilities such as a shelter and a timetable within the development site. This could reduce car-dependency in this area and increase modal shift, thereby reducing the impact of the development on local and strategic roads. A bus capacity assessment would need to be conducted in order to establish whether the existing capacity provision will meet the predicted demand from the future development.

In order to promote sustainable travel, the process of 'pump priming' should be introduced prior to any new redevelopment occurring within the site. Bus services should be introduced prior to any occupation begins, so that people travelling to or from the site have a choice of travel mode from day one and before travel habits / patterns emerge.

Rail Service Provision

Arriva Trains Cymru operates half-hourly train services from Treherbert to Cardiff via Pontypridd. Treherbert station is approximately 3km from the development site which is considered to be too far for pedestrians to walk. There is however a rail bus provided by Arriva Cymru (Service No. 120/130) which integrates with local rail services at Treherbert Station, where rail services to Pontypridd and Cardiff are available.

At present the frequency of these services are two rail services per hour, which is likely to be the most frequent level of service provision without major track and signalling works. However it may be possible to increase the number of carriages per train, especially during peak hours to provide more capacity to meet potential extra demand from the redevelopment of the Fernhill Colliery. This will reduce the number of car trips and lessen the impact on the strategic highway network. Further studies should be conducted to verify whether there is sufficient capacity on existing train services to accommodate any increased patronage from the redevelopment of the Fernhill Colliery site and also capacity within the station to extend the platform. Support has previously been communicated by the Minister of Economic Development and Transport to extend all platforms on the Treherbert line to accommodate 6 carriage trains, thereby increasing capacity.

Provision for Pedestrians and Cyclists

Footways are largely present on both sides of the Brook Street carriageway that passes through Blaenrhondda, although they generally less than 1.8m wide. Moreover, cars were noted to park illegally on the double yellow lines

that align the eastern side of the Brook Street carriageway, thereby restricting the free movement of pedestrians.

The level of cycle infrastructure provision within the local area is considered to be unsatisfactory. A National Cycle network traffic-free route is located approximately 1.5km east of the site at the top of the valley, however the topographical constraints are likely to act as barrier to the integration of cycle linkages from the proposed development site to the existing cycle network.

Therefore, any future redevelopment of the site should consider the relatively poor existing cycle and pedestrian links and should seek to link the site with the existing settlement to ensure that the site is an extension of the existing urban settlement and not segregated by any boundaries.

6.2.10 Summary

- Any future redevelopment of the site should ensure that the site is an extension of the existing urban settlement and not segregated by any physical boundaries. Integration with the existing urban settlement will ease accessibility and encourage sustainable transport use, thereby reducing demand on the RCT strategic highway network.
- The capacity assessment of the key links has demonstrated that forecast traffic generation from this site should not have a detrimental impact on the RCT strategic highway network and should not require any highway link upgrade to manage the additional traffic. Further studies will be required to ascertain whether the additional traffic will impact upon the operational performance of the key junctions on the strategic highway network.
- Further studies into the viability of a new form of vehicular access would be beneficial prior to commencing any redevelopment plans for this site as the existing access via Brook Street is restrictive.
- A comprehensive Masterplan must be devised at an early stage of this site's redevelopment design process to maximise accessibility by all modes of transport.
- A Travel Plan should be agreed prior to first occupation of the redevelopment.
- Consideration should be given to 'pump priming' prior to first occupation.

6.3 Site 3 – Former Phurnacite Plant, Abercwmboi

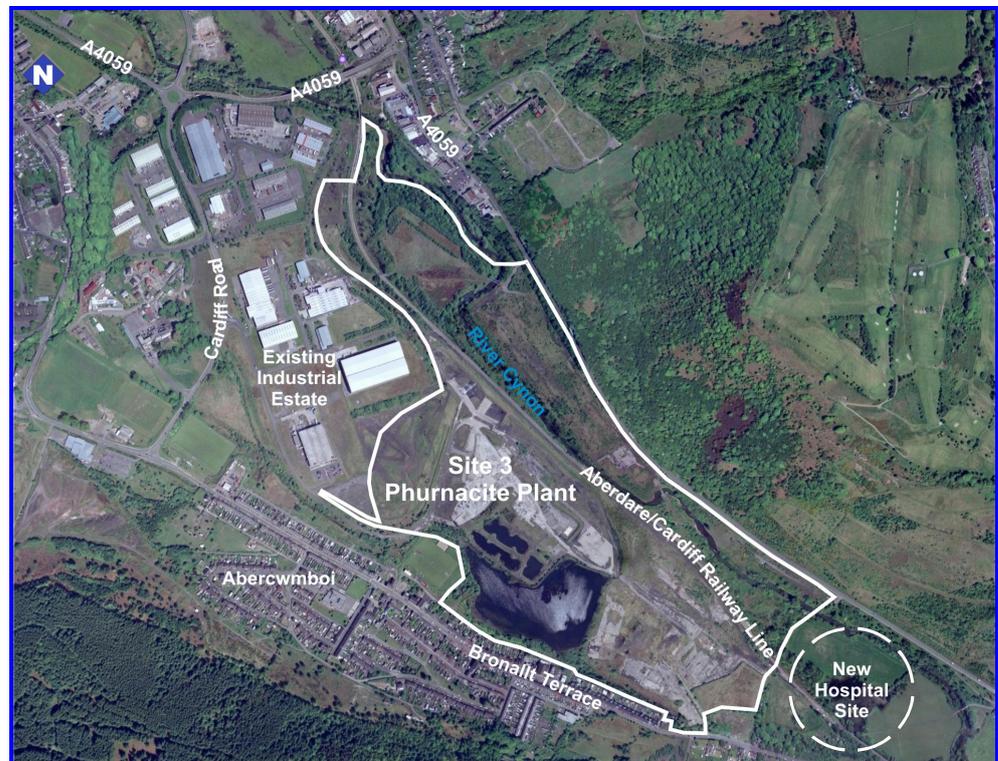
6.3.1 Site Location and Description

The Abercwmboi Phurnacite Plant Strategic Development Site is located on the eastern periphery of the village of Abercwmboi in the Cynon Valley. The site is approximately 58 hectares in size and is bounded to the north by existing industrial units, to the east by the A4059; and to the south and west by the residential area of Abercwmboi.

A phurnacite plant previously occupied this site for the process of small coal into ‘briquettes’. Almost all of the phurnacite plant infrastructure has now been removed, however the current topography still reflects the site’s previous use. It is considered essential that land remediation and reclamation will be required before future development can commence.

Further site constraints exist in the form of the River Cynon and the Aberdare-Cardiff railway line, both of which run in parallel from north to south, effectively dissecting the development site and limiting the extent of the developable area.

An aerial photograph depicting the development site, its surrounding area and local transport facilities is illustrated below.



6.3.2 Local Highway Network and Existing Site Access

The development site is located adjacent to the A4059, a single carriageway road, which forms part of the RCT strategic road network. The A4059 is an important road that links the development site area with the A465 Heads of the Valley road to the north, and the A470 and ultimately the M4 motorway to the south. All existing access points have been 'stopped-up' in order to prevent public access onto the site, although they are readily identifiable when driving along the A4059 and Bronallt Terrace.

6.3.3 Local Highway Improvement Schemes

A new neighbourhood hospital has recently been granted outline planning consent on a parcel of land connected to the south east boundary of the strategic site where primary access will be taken from the A4059. It is envisaged that a relatively large junction will be required to access this new hospital and will have some impact on the traffic flow along the A4059, in terms of journey time and speed.

6.3.4 Future Site Redevelopment

It is necessary to establish the potential level of development so that traffic generation can be forecast. It is envisaged that the future redevelopment of this site is likely to consist of a mix of employment, residential and leisure uses.

The development site is restricted by topography, the River Cynon and the Cardiff-Aberdare railway line which will limit the size of any future redevelopment. Therefore it is considered that approximately 50% of the total site area will be viable for future development, which equates to approximately 34.8 Hectares of developable area. The Gross Floor Area (GFA) of buildings generally equates to 40% of the developable area for employment and leisure uses. As such, a GFA of 40% has been used in this assessment to calculate the developable area on this site. Residential development has been calculated at an average density of 40 dwellings per hectare.

To this end, it has been assumed for the purposes of this assessment that the level of future redevelopment at this site will include 500 residential dwellings, 42,000 m² of employment and 14,000 m² of leisure facilities.

6.3.5 Trip Generation

Table 6.7 illustrates the trip rates that could occur at the development site during the AM and PM highway peak hours, as predicted by TRICS.

Table 6.7 – Phurnacite trip rates

Land Use	Period	Arrivals	Departures	Two-way
Residential	AM	0.147	0.646	0.793
	PM	0.546	0.237	0.783
Employment Ind. Est.	AM	0.513	0.213	0.726
	PM	0.140	0.458	0.598
Leisure Centre	AM	0.566	0.478	1.044
	PM	1.263	1.097	2.360

Table 6.8 illustrates the traffic generation that would occur at the site as a result of the proposed development during the AM and PM highway peak hours, as predicted by TRICS. These figures are based on the development of 500 residential dwellings, 42,000 m² of employment and 14,000 m² of leisure facilities on this site.

Table 6.8 – Phurnacite traffic generation

Land Use	Period	Arrivals	Departures	Two-way
Residential	AM	74	323	397
	PM	273	119	392
Employment Ind. Est.	AM	215	90	305
	PM	59	192	251
Leisure Centre	AM	79	67	146
	PM	177	154	330
Total	AM	368	480	848
	PM	509	465	973

6.3.6 Strategic Highway Assessment

The gravity model has been used to calculate the impact of forecast traffic on the strategic highway network, resulting from the redevelopment of the Phurnacite strategic development site. **Figures 6.13** and **6.14** illustrate the AM and PM development traffic distribution, **Figures 6.15** and **6.16** illustrate the highway network traffic volumes and **Figures 6.17** and **6.18** illustrate the AM and PM development traffic percentage impact on the strategic highway network.

The strategic road most affected by the proposed redevelopment of the Phurnacite site will be the A4059. The percentage impact from the development on this road varies between 10-17% in the AM and 12-26% in the PM peak hour, which represents a low to medium level of growth on this part of the strategic road network. The impact on the A4059 to the

north of the development site is not considered to be so much of an issue as the A4059 south of the development site, which is a heavily utilised existing commuter route.

The route of the A4059 (Mountain Ash section) travels through a built up area with traffic signals, pedestrian crossings, traffic calming measures, reduced speed limit and residential properties directly adjoining the carriageway. These ‘built-up’ features ultimately reduce the capacity and any increase in traffic will result in increased congestion and a reduction in highway safety on this link.

The percentage increases from the development on all other strategic roads are generally less than 5% in both the AM and PM peak hours and are not, therefore, considered to be a significant issue.

Table 6.9 summarises the highway links most affected by the 2025 baseline traffic flows with the Phurnacite development site traffic and compares them to the highways’ theoretical capacity. The cells highlighted in red indicate links that will be operating with less than 5% capacity, or over capacity. Whilst cells highlighted in orange indicate links that will be operating with less than 20% capacity remaining.

Table 6.9 – Phurnacite forecast traffic volumes					
Road	Total No. of Lanes	Road Type	Capacity as per TA 79/99	Predicted 2025 Base Flows	
				AM	PM
A4059	2	UAP2	1470	1279 (N)	1445 (N)
				1399 (S)	1372 (S)

Note: TA 79/99 Capacity is shown per direction

Table 6.9 demonstrates that although the Phurnacite traffic has a low to medium percentage impact on the A4059, the (base + development) traffic flows are approaching the theoretical capacity level of each of the links (northbound and southbound). Therefore it will be necessary to further investigate highways and transportation improvements along the A4059 ‘corridor’, so that the future redevelopment of this site does not compound the existing congestion problems. Further studies into the operational performance of key junctions may also be required.

6.3.7 Proposed Site Access

If the industrial units are located in the northern section of the development site, then primary access should be taken via the existing industrial estate spine roads. However, due to the location of the railway line this may not be possible and so further studies should be conducted to investigate the costs and engineering implications of introducing a railway crossing facility at this location. Should crossing the railway not be a viable option, then a primary access to this development site could be taken from the A4059,

utilising a shared access with the proposed hospital. The River Cynon will also need to be crossed if access from the A4059 is to be taken, which may impact on the viability and type of junction. A Flood Risk Assessment should also be conducted to establish whether the site is located within a floodplain, particularly for vulnerable land uses according to TAN 15, such as residential.

The residential element of the proposed redevelopment scheme should aim to take the form of an extension of the existing Abercwmboi urban settlement, whereby streets link up to promote a sense of community, as recommended in Manual for Streets (2007). Residents are then encouraged to walk and cycle to local amenities, as opposed to using their motor cars. A new site access could potentially be taken from the A4059 with a suitable junction arrangement and possible speed limit reduction. Consideration should be given to the junction spacing if the primary access cannot be merged into the proposed hospital access, so as not to impede traffic on the A4059.

6.3.8 Key Junctions

As stated in the methodology section, junction capacity analysis was not within the scope of this capacity assessment. However, the key junctions that may be adversely affected by the traffic generated by the development site include:

- A4059 / Canal Road roundabout
- A4059 / Cardiff Road roundabout (Asda access road)
- A4059 / A4233 roundabout
- A4059 / Llwydcoed Road roundabout
- A4059 / A4059 Hirwaun Road roundabout
- A4059 / Abercynon Road T-junction
- A4059 / Ffrwd Crescent signalised circulatory
- A470 / A4059 roundabout (Abercynon)
- Junction 32 M4 motorway (grade separated)
- A465 / A4061 roundabout

These should be tested in terms of their operational capacity in future studies.

6.3.9 Sustainable Transport Assessment

Bus Service Provision

A half-hourly bus service (No.X6) is operated by Veolia Transport Cymru and links the site to Aberdare in the north and Pontypridd in the south. The nearest existing bus stop is located on the B4275, approximately 20m from

the development site, which is considered to be very close. There is no shelter but there is a pole and flag with a timetable.

The level of existing bus service provision is considered to be good; however service levels could be increased from the existing two services to three services per hour in order to serve the strategic development site. A new bus stop including a shelter and turning facility could also be located within the development site for improved access. This could reduce car-dependency in this area and increase modal shift, thereby reducing the impact of the development on local and strategic roads. A bus capacity assessment would need to be conducted in order to establish whether the existing capacity provision will meet the predicted demand from the future development.

In order to promote sustainable travel, the process of 'pump priming' should be introduced prior to any new redevelopment occurring within the site. Bus services should be introduced prior to any occupation begins, so that people travelling to or from the site have a choice of travel mode from day one and before travel habits / patterns emerge.

Rail Service Provision

Arriva Trains Cymru operates half-hourly train services from Penrhiwceiber to Aberdare in the north and Cardiff in the south. Pedestrians can follow a direct 0.5km route from the development site to Penrhiwceiber station along Aberdare Road. There are footways provided on both sides of the carriageway, which benefit from street lighting along their length.

At present the frequency of these services are two services per hour which is likely to be the most frequent level of service provision without major track and signalling works. However it may be possible to increase the number of carriages per train, especially during peak hours to provide more capacity to meet potential extra demand from the redevelopment of the Phurnacite site. Further studies should be conducted to verify whether there is sufficient capacity on existing train services to accommodate any increased patronage from the redevelopment of the site, comprising residential, employment and leisure uses. This will reduce the number of car trips and lessen the impact on the strategic highway network. At present it is unlikely that most station platforms will be able to accommodate longer trains and as such may require extending. To this end SEWTA has committed itself to extending all platforms on the Aberdare line to accommodate 4 carriage trains.

Provision for Pedestrians and Cyclists

Street-lit footways are largely present on both sides of Aberdare Road, which passes through Abercwmbol, although they generally do not conform to the standard width requirement. Whilst pedestrian refuges are present at intermittent locations, parked cars were observed on both sides of the carriageway which is likely to reduce pedestrian safety.

A footway is provided along the western side of the A4059 carriageway; however it is generally unlit and is considered to be of sub-standard width

given the 60mph speed limit of the A4059. There is however a footbridge that adjoins the footway to the eastern side of the carriageway where Mountain Ash Comprehensive School is located. This will be important for a future Safe Routes to School linkage.

The level of cycle infrastructure provision within the local area is considered to be unsatisfactory. A National Cycle network traffic-free route is located approximately 1.5km south of the site, although connections to the cycleway from Abercwmboi are limited which could deter the local population from using the cycle route.

It will be important for any future redevelopment of the site to provide good pedestrian and cycle links though the site from the A4059 to Aberdare Road and to the existing urban settlements. This will ensure that the site is permeable and an extension of the existing settlement and not a segregated development. There is also an opportunity to provide an excellent 'safe routes to school' scheme in place given the close proximity of Mountain Ash Comprehensive School. Though there is an existing footbridge across the A4059, it is envisaged that a potential 'at-grade' pedestrian and cycle crossing facility could be installed as part of the Hospital redevelopment or Phurnacite redevelopment access junction (signalised).

6.3.10 Summary

- Any future redevelopment of the site should ensure that the site is an extension of the existing urban settlement and industrial estate and not segregated by any physical boundaries. Integration with the existing urban settlement will ease accessibility and encourage sustainable transport use, thereby reducing demand on the RCT strategic highway network. Integration of the employment element with the existing industrial estate will reduce the need for a new vehicular access point on the A4059.
- The capacity assessment of the key links has demonstrated that forecast traffic generation from the proposed redevelopment at this site will have a negative impact on the A4059. This link is forecast to approach its theoretical capacity level and will require attention. Further studies will be required to ascertain whether the additional traffic will impact upon the operational performance of the key junctions on the strategic highway network.
- A comprehensive Masterplan must be devised at an early stage of this site's redevelopment design process to maximise accessibility by all modes of transport.
- A Travel Plan should be agreed prior to first occupation of the redevelopment.
- Consideration should be given to 'pump priming' prior to first occupation.

6.4 Site 4 – Robertstown / Abernant - Aberdare

6.4.1 Site Location and Description

The Robertstown/Abernant Strategic Development Site is located on the eastern periphery of Aberdare Town Centre and can be divided into two sections for the purposes of description. The site is currently occupied in the northern section by Aberdare General Hospital and its associated ambulatory care wards; the southern section by the current railway station car park, land associated with the disused section of Aberdare Railway Station and land formerly associated with Robertstown Industrial Estate.

The development site is approximately 28 hectares in size and is bounded to the north by fields, to the east by the residential area known as Abernant, to the south by the A4059 and to the west by Aberdare Town Centre. The sites' gradient generally runs from north to south and it is bisected approximately northwest to southeast by both the River Cynon and Wellington Street.

An aerial photograph depicting the development site, its surrounding area and local transport facilities is illustrated below.



6.4.2 Local Highway Network and Existing Site Access

The development site is located just north of the A4059 (Aberdare Bypass), which forms part of the RCT Strategic Road Network, but is separated from it by the Aberdare to Hirwaun freight rail line. The development site is bisected by Wellington Street which connects Abernant with Robertstown. Wellington Street is a generous width industrial estate road that serves as a spine road for the land adjacent to it and therefore has existing access points located along its length. The northern section of land currently occupied by Aberdare General Hospital is currently accessed via Abernant Road, which although has generous width, the on-street parking along its length significantly reduces the useable carriageway width and forward visibility.

The A465 lies approximately 8km to the north of the development site and provides a vital link toward Merthyr Tydfil and Abergavenny to the east and Neath and Swansea to the west.

6.4.3 Local Highway Improvement Schemes

The A465 between Merthyr Tydfil and Abergavenny has recently undergone major re-alignment and conversion to a dual two-lane carriageway. The road was previously a single-lane carriageway with a crawler lane, generally on the uphill sections. The road was considered to be dangerous in places and was operating beyond capacity in certain places during the peak hours.

Planning is currently being sought for the next section of carriageway to upgrade, from Merthyr Tydfil to Hirwaun. This upgrade of the A465 will have a significant impact on the feasibility of future development in the area. The increase of road capacity, in combination with less congestion and more reliability, is likely to increase the desire of future businesses to locate in this area.

The proposed Aberdare bypass extension scheme is still awaiting funding. Current designs for the bypass extension show that the road will link the existing Aberdare bypass with the A465. This will allow for improved access to the upgraded Heads of the Valley road from the Aberdare/Hirwaun area and will reduce congestion on both local and strategic trunk roads.

6.4.4 Future Site Redevelopment

It is necessary to establish the potential level of development so that traffic generation can be forecast. It is envisaged that the future redevelopment of this site is likely to consist of a mix of residential, employment and commercial uses.

This development site has some topographical and flood-risk issues that may limit the size and location of future development, however most of the

site is considered developable. Therefore it is considered that 75% of the total site area will be viable for future development, which equates to 19.6 Hectares of developable area. The Gross Floor Area (GFA) of buildings generally equates to 40% of the developable area for employment tourism and leisure uses. As such, a GFA of 40% has been used in this assessment to calculate the developable area on this site. Residential development has been calculated at an average density of 40 dwellings per hectare.

To this end, it has been assumed for the purposes of this assessment that the level of future redevelopment at this site will include 600 residential dwellings, 15,500 m² of industrial estate and 8,000 m² of commercial use.

6.4.5 Trip Generation

Table 6.10 illustrates the trip rates that could occur at the development site during the AM and PM highway peak hours, as predicted by TRICS.

Table 6.10 – Abernant/Robertstown trip rates				
Land Use	Period	Arrivals	Departures	Two-way
Residential	AM	0.147	0.646	0.793
	PM	0.546	0.237	0.783
Employment Ind. Est.	AM	0.513	0.213	0.726
	PM	0.140	0.458	0.598
Commercial (supermarket)	AM	3.990	2.434	6.424
	PM	7.041	7.281	14.322

Table 6.11 illustrates the traffic generation that would occur at the site as a result of the proposed development during the AM and PM highway peak hours, as predicted by TRICS. These figures are based on the development of 600 residential dwellings, 15,500 m² of industrial estate and 8,000 m² of commercial use on this site.

Table 7.11 – Abernant/Robertstown traffic generation				
Land Use	Period	Arrivals	Departures	Two-way
Residential	AM	88	388	476
	PM	328	142	470
Employment Ind. Est.	AM	80	33	113
	PM	22	71	93
Commercial (supermarket)	AM	319	194	514
	PM	563	583	1146
Total	AM	487	615	1103
	PM	913	796	1709

6.4.6 Strategic Highway Assessment

The gravity model has been used to calculate the impact of forecast traffic on the strategic highway network, resulting from the redevelopment of the Abernant/Robertstown strategic development site. **Figures 6.19** and **6.20** illustrate the AM and PM development traffic distribution, **Figures 6.21** and **6.22** illustrate the highway network traffic volumes and **Figures 6.23** and **6.24** illustrate the AM and PM development traffic percentage impact on the strategic highway network.

The strategic road most affected by the proposed redevelopment of the Robertstown site will be the A4059. The percentage impact from the development on this road varies between 8-19% in the AM and 13-25% in the PM peak hour, which represents a low level of growth on this part of the strategic road network. The impact on the A4059 to the north of the development site is not considered to be as much of an issue as the A4059 south of the development site, which is a heavily utilised existing commuter route.

The route of the A4059 passes through Mountain Ash, a built up area with traffic signals, pedestrian crossings, traffic calming measures, reduced speed limit and residential properties directly adjoining the carriageway. These will ultimately reduce the capacity of the highway and any increase in traffic is likely to result in increased congestion and a reduction in road safety on this link.

The percentage impact from the development on the A4233 will increase marginally, by 10% in the AM and 14% in the PM peak hours. The A4233 has sufficient reserve capacity to accommodate this additional level of traffic, however given its horizontal and vertical alignment, may require some additional safety measures. The traffic flows on the A465 Hirwaun to Merthyr Tydfil section will also increase marginally, by as much as 6% in the AM and 8% in the PM peak hours. The percentage increase from the development on all other strategic roads is generally less than 5% in both the AM and PM peak hours and is therefore not considered to be an issue.

Table 6.12 summarises the highway links most affected by the 2025 baseline traffic flows with the Abernant/Robertstown development site traffic and compares them to the highways' theoretical capacity. The cells highlighted in red indicate links that will be operating with less than 5% capacity, or over capacity. Whilst cells highlighted in orange indicate links that will be operating with less than 20% capacity remaining.

Table 6.12 – Abernant/Robertstown forecast traffic volumes					
Road	Total No. of Lanes	Road Type	Capacity as per TA 79/99	Predicted 2025 Base Flows	
				AM	PM
A465 Hirwaun to Merthyr	2-3	UAP1	2010	1166 (E)	859 (E)
				714 (W)	1082 (W)
A4059	2	UAP2	1470	1252 (N)	1469 (N)
				1324 (S)	1395 (S)
A4233	2	UAP2	1470	461 (N)	590 (N)
				562 (S)	532 (S)

Note: TA 79/99 Capacity is shown per direction

Table 6.12 demonstrates that although the Abernant/Robertstown site traffic has a low percentage impact on the A4059, the (base + development) traffic flows are approaching or at the theoretical capacity level of each of the links (northbound and southbound) on the A4059. Therefore it will be necessary to further investigate highways and transportation improvements along the A4059 'corridor', so that the future redevelopment of this site does not compound any existing congestion problems. The A4233 and A465 are shown to operate well within capacity in 2025 and as such, no upgrades are considered necessary on these highway links as part of the redevelopment of the Abernant/Robertstown site. It is suggested that further studies into the operational performance of key junctions will be required.

6.4.7 Proposed Site Access

Primary access to the commercial and industrial elements of the redevelopment could be taken from Wellington Street. This is an existing industrial estate spine road that adjoins Abernant to Robertstown and has historically provided access to industrial units. It is also linked via two roundabouts to the A4059 (Aberdare Bypass) which is vital north-south transport corridor for both businesses and commuters.

Primary access for a residential element could be located on Abernant Road. It should be a requirement of any future residential development of the site to link into the existing streets on the eastern side of Abernant Road. This will create a seamless community rather than a segregated development, thereby encouraging residents to cycle and walk along safe

and convenient sustainable transport corridors, instead of utilising their motor car at every opportunity.

However this is likely to be reliant on Abernant Road being able to accommodate the additional development traffic, which further studies will need to establish prior to redevelopment. An alternative primary / secondary access could also be taken from Wellington Street as it has a higher capacity than Abernant Road.

6.4.8 Key Junctions

As stated in the methodology section, junction capacity analysis was not within the scope of this capacity assessment. However, the key junctions that may be adversely affected by the traffic generated by the development site include:

- A4059 / Cardiff Street roundabout
- A4059 / Abernant Road roundabout
- A4059 / A4233 roundabout
- A4059 / Llwydcoed Road roundabout
- A4059 / Hirwaun Road roundabout
- A4059 / Ffrwd Crescent signalised circulatory
- A4059 / Abercynon Road T-junction
- A4059 / Canal Road roundabout
- A4059 / Cardiff Road roundabout (Asda access road)
- A470 / A4059 roundabout (Abercynon)
- Junction 32 M4 motorway

These should be tested in terms of their operational capacity in future studies.

6.4.9 Sustainable Transport Assessment

Bus Service Provision

An hourly bus service (No.1) is operated by Veolia Transport Cymru, on behalf of Stagecoach and links the development site to Aberdare and Abernant. There are existing stops located on Abernant Road, approximately 10m from the development site. There is no shelter but a flag, pole and timetable are provided.

This service could be improved to serve the strategic development site by increasing it to a half-hourly service, possibly only during peak hours, with a new bus-stop with a shelter located within the development site for easier access. This could reduce car-dependency in this area and increase modal shift, thereby reducing the impact of the development on local and strategic roads. A bus capacity assessment would need to be conducted in order to

establish whether the existing capacity provision will meet the predicted demand from the future development.

In order to promote sustainable travel, the process of 'pump priming' should be introduced prior to any new redevelopment occurring within the site. Bus services should be introduced prior to any occupation begins, so that people travelling to or from the site have a choice of travel mode from day one and before travel habits / patterns emerge.

Rail Service Provision

Arriva Trains Cymru operates a half-hourly train services from Aberdare to Cardiff via Pontypridd. Aberdare station is approximately 20m from the southern periphery of the development site.

At present the frequency of these services are two services per hour which is likely to be the most frequent level of service provision without major track and signalling works. However it could be possible to increase the number of carriages per train, especially during peak hours to provide more capacity to meet potential extra demand from the redevelopment of the site. This will reduce the number of car trips and lessen the impact on the strategic highway network. Further studies should be undertaken to verify whether there is sufficient capacity on existing train services to accommodate any increased patronage from the proposed redevelopment. It should be noted that SEWTA has committed itself to extending all platforms on the Aberdare line to accommodate 4 carriage trains.

Provision for Pedestrians and Cyclists

Pedestrians are provided for locally by standard width, well lit footways that are generally of good quality. Aberdare Bus station, railway station, town centre, a superstore and leisure centre are all directly accessible to the development site, within 400m or a 5 minute walk. Signalised pedestrian crossings and a footbridge allow ease of movement across the A4059 and the River Dare to Aberdare town centre.

There are no dedicated urban cycle routes in the town centre area, however whilst there are some local leisure routes, these are not suitable for commuters due to their rural nature and indirect routes. There is some cycle security infrastructure located in the town centre, leisure centre and other local civic buildings.

6.4.10 Summary

- Any future redevelopment of the site should ensure that the site is an extension of the existing urban settlement and not segregated by any physical boundaries. Integration with the existing urban settlement will ease accessibility and encourage sustainable transport use, thereby reducing demand on the RCT strategic highway network.
- The capacity assessment of the key links has demonstrated that forecast traffic generation from the proposed redevelopment at this

site will have a negative impact on the A4059, though will be still be operating within capacity in 2025. Further studies will be required to ascertain whether the additional traffic will impact upon the operational performance of the key junctions on the strategic highway network.

- A comprehensive Masterplan must be devised at an early stage of this site's redevelopment design process to maximise accessibility by all modes of transport.
- A Travel Plan should be agreed prior to first occupation of the redevelopment.
- Consideration should be given to 'pump priming' prior to first occupation.

6.5 Site 5 – Land South of Hirwaun / Penywaun

6.5.1 Site Location and Description

The Land South of Hirwaun/Penywaun Strategic Development site is located on the southern periphery of Hirwaun in the Cynon Valley. The site is approximately 225 hectares in size and is bounded to the north by the A465 Heads of the Valley road, to the east by fields, to the south by the Tower Colliery and to the west by the A4061. The site is also located close to the existing Hirwaun Industrial Estate.

Tower colliery is currently located on this site and was utilised for the extraction of coal from deep mines. The local topography reflects the site's past and current use and it is considered essential that extensive ground works and site remediation will be required before future redevelopment can take place.

An aerial photograph depicting the development site, its surrounding area and local transport facilities is illustrated below.



6.5.2 Local Highway Network and Existing Site Access

The development site is located adjacent to the A465, A4059 and A4061, all of which form part of the RCT Strategic Road Network. The A465 connects the development site area with Merthyr Tydfil to the east and Neath and Swansea to the west. Existing access to the site is taken from the A4061 which links the development site to the A465 to the north and the Blaenrhondda Valley to the south.

6.5.3 Local Highway Improvement Schemes

The A465 lies directly adjacent to the development site and provides a key link toward Merthyr Tydfil and Abergavenny to the east and Neath and Swansea to the west. The A465 between Merthyr Tydfil and Abergavenny has recently undergone major re-alignment and conversion to a dual two-lane carriageway. The road was previously a single-lane carriageway with a crawler lane, generally on the uphill sections. The road was considered dangerous in places and was operating beyond capacity in certain places during the peak hours.

Planning is currently being sought for the next section of carriageway to upgrade, from Merthyr Tydfil to Hirwaun. This upgrade of the A465 will have a significant impact on the feasibility of future development in the area as the increase of road capacity in combination with less congestion and more reliability will increase the desire of future businesses to locate in this area.

The current A465 upgrade proposals plan shows the new highway alignment bypassing Hirwaun and skirting around the southern periphery and through the development site. Whilst this upgraded road will undoubtedly improve capacity, it does take up a large portion of the most developable land within the site. This will act as a barrier between the existing urban settlement and the future development, reducing the level and location of development within the site and significantly, restricting future access points.

6.5.4 Future Site Redevelopment

It is necessary to establish the potential level of development so that traffic generation can be forecast. It is envisaged that the future redevelopment of this site is likely to consist of a mix of employment and residential uses. The eastern section of the site is a suitable location for an urban extension of Hirwaun. The western section of the site is more likely to be more suited to employment use redevelopment as it is close to the existing Hirwaun Industrial Estate.

It is considered likely that even after major ground remediation that some of the development site will not be viable for development. When combined with the restrictions of the A465 upgrade, it is considered that only 40% of the total site area will be viable for future development, which equates to 90

Hectares of developable area. The Gross Floor Area (GFA) of buildings generally equates to 40% of the developable area for employment uses. As such, a GFA of 40% has been used in this assessment to calculate the developable area on this site. Residential development has been calculated at an average density of 40 dwellings per hectare.

To this end, it has been assumed for the purposes of this assessment that the level of future redevelopment at this site could include 1000 residential dwellings and 260,000 m² of employment use. We appreciate that this is a large figure but this is a big site with excellent strategic links to the A465, A4059 and A4061.

Whilst it is not crucial for the A465 Heads of the Valleys upgrade to be completed before the redevelopment of this site can commence, the scale of the proposed carriageway realignment will have an impact upon the development site and this should be taken into consideration before planning consent is granted for any future developments on this site.

The size of this strategic development site is very large, approximately the same size as the existing urban settlement (Hirwaun), consequently it will give rise to large volumes of additional traffic. Therefore it would not be appropriate to 'load' all of these development borne vehicles onto a single carriageway or through a single junction. A future study should be conducted to ascertain the best location for access points to this development site, from both local roads and the A465 upgrade scheme.

6.5.5 Trip Generation

Table 6.13 illustrates the trip rates that could occur at the development site during the AM and PM highway peak hours, as predicted by TRICS.

Land Use	Period	Arrivals	Departures	Two-way
Residential	AM	0.147	0.646	0.793
	PM	0.546	0.237	0.783
Employment Bus. park	AM	1.037	0.146	1.183
	PM	0.125	0.852	0.977

Table 6.14 illustrates the traffic generation that would occur at the site as a result of the proposed development during the AM and PM highway peak hours, as predicted by TRICS. These figures are based on the development of 1000 residential dwellings and 260,000 m² of employment use on this site.

Table 6.14 – Hirwaun/Penywaun traffic generation				
Land Use	Period	Arrivals	Departures	Two-way
Residential	AM	147	646	793
	PM	546	237	783
Employment Bus. park	AM	2696	380	3076
	PM	325	2215	2540
Total	AM	2843	1026	3869
	PM	871	2452	3323

6.5.6 Strategic Highway Assessment

The gravity model has been used to calculate the impact of forecast traffic on the strategic highway network, resulting from the redevelopment of the Hirwaun/Penywaun strategic development site. **Figures 6.25** and **6.26** illustrate the AM and PM development traffic distribution, **Figures 6.27** and **6.28** illustrate the highway network traffic volumes and **Figures 6.29** and **6.30** illustrate the AM and PM development traffic percentage impact on the strategic highway network.

Due to the potentially large scale redevelopment of this site, the resulting level of predicted traffic is relatively high and will therefore appear to have a detrimental impact on the strategic highway network, especially on the A465, A470, A4233, A4061 and the A4059 links.

The impact from the development on the A465 varies between 9-204% in the AM peak hour and 8-184% in the PM peak hour.

The impact from the development on the A470 varies between 2-10% in the AM peak hour and 1-10% in the PM peak hour.

The impact from the development on the A4233 varies between 4-24% in the AM peak hour and 3-21% in the PM peak hour.

The impact from the development on the A4061 varies between 16-115% in the AM peak hour and 12-93% in the PM peak hour.

The impact from the development on the A4059 varies between 8-80% in the AM peak hour and 7-64% in the PM peak hour.

Table 6.15 summarises the highway links most affected by the 2025 baseline traffic flows with Maerdy development site traffic and compares them to the highways' theoretical capacity. The cells highlighted in red indicate links that will be operating with less than 5% capacity, or over capacity. Whilst cells highlighted in orange indicate links that will be operating with less than 20% capacity remaining.

Table 6.15 – Hirwaun/Penywaun forecast traffic volumes					
Road	Total No. of Lanes	Road Type	Capacity as per TA 79/99	Predicted 2025 Base Flows	
				AM	PM
A465 Hirwaun to Merthyr	2-3	UAP1	2010	1867 (E)	3117 (E)
				3489 (W)	1877 (W)
A465 Hirwaun to Neath	4	UAP1	3600	1181 (E)	1038 (E)
				975 (W)	1219 (W)
A470	4	UAP1	3600	4518 (N)	4607 (N)
				3791 (S)	3925 (S)
A4059	2	UAP2	1470	2030 (N)	1460 (N)
				1468 (S)	1991 (S)
A4061	2	UAP2	1470	741 (N)	717 (N)
				665 (S)	749 (S)
A4233	2	UAP2	1470	499 (N)	577 (N)
				562 (S)	554 (S)

Note: TA 79/99 Capacity is shown per direction

Table 6.15 demonstrates that under the (base + development) traffic loading, the A465, A470 and A4059 are operating significantly above their theoretical capacity level. Therefore it will be necessary to further investigate highways and sustainable transportation improvements along the A465, A470 and A4059 ‘corridors’, so that the future redevelopment of this site does not compound the existing congestion problems.

The A4233 and A4061 forecast to operate well within capacity in 2025 under development site traffic loading, and as such, no upgrades are considered necessary on these highway links as part of the redevelopment of the Hirwaun/Penywaun site. However, further studies into the operational performance of key junctions may still be required.

6.5.7 Proposed Site Access

Primary access to this development will vary depending upon the location of the various elements of the redevelopment. If the residential element is to be placed in the eastern section of the development site then access points should be located along the A4059, so as to provide a continuation of the existing streets. This will promote more of a sense of community and sense of place, as opposed to a segregated development. If the business park is to be located on the western section of the development site then amendments to the proposed A465 dualling plans should be sought at the earliest possible opportunity. It will be necessary to conduct further studies to determine the size and nature of junction required at the Tower Colliery junction in northern Hirwaun, or whether the proposed grade separated junction (part of the A465 dualling scheme), will be sufficient to manage the additional traffic associated with the business park. Redevelopment plans should investigate alternative means of access also, as the proposed A465

dualling scheme may not be completed within the timeframe of this assessment. Secondary access points could be taken from the existing A465 alignment upon completion of the A465 dualling upgrade and the A4061.

6.5.8 Key Junctions

As stated in the methodology section, junction capacity analysis was not within the scope of this capacity assessment. However, the key junctions that may be adversely affected by the traffic generated by the development site include:

- A4059 / Cardiff Street roundabout
- A4059 / Abernant Road roundabout
- A4059 / A4233 roundabout
- A4059 / Llwydcoed Road roundabout
- A4059 / Hirwaun Road roundabout
- A4059 / Ffrwd Crescent signalised circulatory
- A4059 / Abercynon Road T-junction
- A4059 / Canal Road roundabout
- A4059 / Cardiff Road roundabout (Asda access road)
- A470 / A4059 roundabout (Abercynon)
- A465 / A4059 Hirwaun Road roundabout
- A465 / A4061 roundabout
- Junction 32 M4 motorway

These should be tested in terms of their operational capacity in future studies.

6.5.9 Sustainable Transport Assessment

Bus Service Provision

Bus service (No.X55) is operated by Veolia Transport Cymru and links the development site with Rhigos and Neath to the north and Hirwaun and Aberdare in the south. The nearest existing stops are located on the A4061, directly adjacent to the development site. There is no shelter but a flag, pole and timetable are provided.

This service could be improved to serve the strategic development site by increasing the number of services per hour and add a new bus-stop with shelter, located within the development site for easier access. This could reduce car-dependency in this area and increase modal shift, thereby reducing the impact of the development on local and strategic roads. A bus capacity assessment would need to be conducted in order to establish

whether the existing capacity provision will meet the predicted demand from the future development.

In order to promote sustainable travel, the process of 'pump priming' should be introduced prior to any new redevelopment occurring within the site. Bus services should be introduced prior to any occupation begins, so that people travelling to or from the site have a choice of travel mode from day one and before travel habits / patterns emerge.

Rail Service Provision

Arriva Trains Cymru operates half-hourly train services from Aberdare to Cardiff via Pontypridd. Aberdare station is approximately 7km from the development site. This is obviously too far to walk from the site and over the recommended distance to cycle to from the development site, however Arriva Cymru operates a rail bus (service number RL3) that connects the railway station to Hirwaun and Rhigos. This service integrates with the rail services and essentially provides an extension of the Aberdare railway line.

At present the frequency of these services are two services per hour which is likely to be the most frequent level of service provision without major track and signalling works. However it could be possible to increase the number of carriages per train, especially during peak hours to provide more capacity to meet potential extra demand from the redevelopment of the site. This will reduce the number of car trips and lessen the impact on the strategic highway network.

Further studies should be conducted to verify whether there is sufficient capacity on existing train services to accommodate any increased patronage from the potential redevelopment. It is worth noting that SEWTA has committed itself to extending all platforms on the Aberdare line to accommodate 4 carriage trains.

Provision for Cyclists and Pedestrians

There is very little existing provision for cyclists or pedestrians within the development site and is largely segregated from the Hirwaun settlement by the existing A465 carriageway alignment.

Future developments should include a cycle and pedestrian access strategy that should aim to integrate the development into the existing urban settlements of Hirwaun, Penywaun and Rhigos.

The National Cycle Network route number 47 runs to the west of the development site, along the top of the valley. This route is only considered suitable for leisure use however and is not appropriate for commuters due to its topography.

6.5.10 Summary

- Any future redevelopment of the site should ensure that the site is an extension of the existing urban settlement and industrial estate and not segregated by any physical boundaries. Integration with the existing urban settlement will ease accessibility and encourage sustainable transport use, thereby reducing demand on the RCT strategic highway network.
- The capacity assessment of the key links has demonstrated that forecast traffic generation from the proposed redevelopment at this site will have a significant impact on the A4233, A4059, A4061, A465 and A470 links. The impact upon the A4059 and A470 will need to be addressed through further transport corridor studies to determine the best method of managing the forecast traffic demand. The A465 section that is shown to be over capacity could be resolved through the A465 dualling upgrade scheme, for which funding is currently being sought by the Welsh Assembly Government. The other highways are considered to be operating within capacity in 2025 and as such, no remedial works is considered a requirement of the redevelopment of this site. Further studies will be required to ascertain whether the additional traffic will impact upon the operational performance of the key junctions on the strategic highway network.
- A comprehensive Masterplan must be devised at an early stage of this site's redevelopment design process to maximise accessibility by all modes of transport.
- A Travel Plan should be agreed prior to first occupation of the redevelopment.
- Consideration should be given to 'pump priming' prior to first occupation.

6.6 Site 6 – Cwm Colliery and Coking Works, Beddau

6.6.1 Site Location and Description

The Cwm Colliery and Coking Works Strategic Development Site is located on the northern periphery of Beddau and is approximately 84 hectares in size. The site is bounded to the north, east and west by fields and to the south by the urban area of Beddau.

The Cwm Colliery was formerly located on this site and was utilised for the extraction of coal from deep mine's and processing in the coking works. It appears that most of the colliery infrastructure has yet to be removed and the current topography reflects the site's previous use. It is considered essential to the future redevelopment of this site that the colliery infrastructure is removed and extensive land remediation and reclamation be carried out.

An aerial photograph depicting the development site, its surrounding area and local transport facilities is illustrated below.



6.6.2 Local Highway Network and Existing Site Access

The development site is currently accessed from an unnamed road of generous width that adjoins 'Woodlands' to the south and connects with Heol-y-Beddau to the west. The rear gardens of Commercial Street back on to this unnamed road and some informal parking does take place along its southern section. The junction with Woodlands takes the form of a priority T-junction that has excellent visibility in either direction, partly due to its location on the outside of a bend. The speed limit along Woodlands is restricted to 30mph.

Woodlands connects with the A473 to the southwest via a signalise junction. The A473 forms part of the RCT strategic highway network and links the Beddau area to Pontypridd and the A470 to the north, and Llantrisant and the M4 motorway to the south.

6.6.3 Local Highway Improvement Schemes

The proposed Church Village Bypass scheme is of local relevance to this development site. The scheme is intended to significantly reduce traffic along the existing A473 to reduce journey times between the main population centres and bypass the settlements of Tonteg, Church Village, Efail Isaf and Llantwit Fardre.

The proposed bypass will begin at the western end of Tonteg and will skirt around the east of Church Village and the south of Beddau, eventually connecting with the existing A473 carriageway that leads to the Talbot Green Bypass. The scheme will be approximately 7.5km in length and will take the form of a dual 2-lane carriageway and will be constructed in one stage. This scheme will benefit the Cwm Colliery strategic site by allowing faster and more reliable access to the strategic road network such as the A470 and M4 motorway. It is also considered that the Bypass scheme will attract traffic travelling between the heavily congested Pontypridd area and the M4 west area, thereby reducing congestion around the A470 and the Coryton interchange.

6.6.4 Future Site Redevelopment

It is necessary to establish the potential level of development so that traffic generation can be forecast. It is envisaged that the future redevelopment of this site is likely to consist of a mix of employment, residential and community uses.

It is considered likely that even after major ground remodelling and colliery infrastructure removal, that some of the development site will not be viable for development. Therefore it is considered that only 50% of the total site area will be viable for future development, which equates to 42 Hectares of developable area. The Gross Floor Area (GFA) of buildings generally equates to 40% of the developable area for employment and community uses. As such, a GFA of 40% has been used in this assessment to

calculate the developable area on this site. Residential development has been calculated at an average density of 40 dwellings per hectare.

To this end, it has been assumed for the purposes of this assessment that the level of future redevelopment at this site could include 800 residential dwellings, 77,000 m² of employment and 10,000 m² community uses.

6.6.5 Trip Generation

Table 6.16 illustrates the trip rates that could occur at the development site during the AM and PM highway peak hours, as predicted by TRICS.

Table 6.16 – Cwm colliery trip rates				
Land Use	Period	Arrivals	Departures	Two-way
Residential	AM	0.147	0.646	0.793
	PM	0.546	0.237	0.783
Employment Ind. Est.	AM	0.513	0.213	0.726
	PM	0.140	0.458	0.598
Community - School	AM	1.724	1.043	2.767
	PM	0.255	0.380	0.635

Table 6.17 illustrates the traffic generation that would occur at the site as a result of the proposed development during the AM and PM highway peak hours, as predicted by TRICS. These figures are based on the development of 800 residential dwellings, 77,000 m² of employment and 10,000 m² community uses on this site.

Table 6.17 – Cwm colliery traffic generation				
Land Use	Period	Arrivals	Departures	Two-way
Residential	AM	118	517	635
	PM	437	190	627
Employment Ind. Est.	AM	395	164	559
	PM	108	353	461
Community - School	AM	172	104	276
	PM	26	38	64
Total	AM	685	785	1470
	PM	571	581	1152

6.6.6 Strategic Highway Assessment

The gravity model has been used to calculate the impact of forecast traffic on the strategic highway network, resulting from the redevelopment of the Cwm Colliery strategic development site. **Figures 6.31** and **6.32** illustrate the AM and PM development traffic distribution, **Figures 6.33** and **6.34** illustrate the highway network traffic volumes and **Figures 6.35** and **6.36** illustrate the AM and PM development traffic percentage impact on the strategic highway network.

The strategic highways most affected by the proposed redevelopment of the Cwm Colliery site will be the A473, A468 and A4119 (M4 to Llantrisant section).

The percentage impact from the development on the A473 varies between 0-39% in the AM and 0-37% in the PM peak hour, which represents a low to medium level of growth on this part of the strategic road network.

The percentage impact from the development on the A468 varies between 10-11% in the AM and 7-8% in the PM peak hour, which represents a low level of growth on this part of the strategic road network.

The percentage impact from the development on the A4119 (M4 to Llantrisant section) varies between 11-12% in the AM and 8-9% in the PM peak hour, which represents a low to medium level of growth on this part of the strategic road network.

The percentage increases from the development on all other strategic roads is generally less than 7% in both the AM and PM peak hours; and therefore is not considered to be an issue.

Table 6.18 summarises the highway links most affected by the 2025 baseline traffic flows with Cwm Colliery development site traffic and compares them to the theoretical capacity of the link. The cells highlighted in red indicate links that will be operating with less than 5% capacity, or over capacity. Whilst cells highlighted in orange indicate links that will be operating with less than 20% capacity remaining.

Table 6.18 – Cwm colliery forecast traffic volumes					
Road	Total No. of Lanes	Road Type	Capacity as per TA 79/99	Predicted 2025 Base Flows	
				AM	PM
A468	4	UAP1	3600	2356 (E)	2231 (E)
				2258 (W)	2399 (W)
A473	2	UAP2	1470	1428 (E)	1742 (E)
				1745 (W)	1291 (W)
A4119 (Section between M4 and Llantrisant)	4	UAP1	3600	2245 (N)	2592 (N)
				2406 (S)	2314 (S)

Note: TA 79/99 Capacity is shown per direction

Table 6.18 demonstrates that although the Cwm Colliery site traffic has a low to medium percentage impact on the A473, the (base + development) traffic flows are above the theoretical capacity level of each of the links westbound in the AM peak and eastbound in the PM peak hour. Therefore it will be necessary to further investigate highways and transportation improvements along the A473 'corridor', so that the future redevelopment of this site does not compound the existing congestion problems. It must be recognised however that this assessment doesn't account for any potential relief on the A473 resulting from the Church Village bypass.

The A468 and A4119 are shown to operate well within capacity in 2025 and as such, no upgrades are considered necessary on these highway links as part of the redevelopment of the Cwm Colliery site. However, further studies into the operational performance of key junctions may still be required.

6.6.7 Proposed Site Access

The primary point of access should be located on the southern boundary of this development site, on Woodlands Road. This is a good location for an access point as it is on the outside of a natural bend and has excellent visibility in either direction. Further studies will be required but if capacity becomes an issue at the existing junction with the A473, then what we understand to be a disused railway line linking the site to the A473 could be converted, as an option, to provide a new link road to feed Beddau and the development site from the south, thereby relieving the existing junction to manage traffic from the north only.

Secondary access points could be located along Croescade Road on the eastern boundary and the 'unnamed' road that runs along the western boundary of the development site. If the future redevelopment of this site has residential dwellings in the southern section then vehicular links should be made from east to west to allow continuity through the community. This should include a link from Heol Dyhewydd to Commercial Street and Heol Brynhyfryd to Heol-Y-Beddau. This method of traffic distribution will however, be reliant on local junctions and local link roads being subject to forecast traffic capacity analysis and demonstrated to be capable of withstanding this additional development traffic.

6.6.8 Key Junctions

As stated in the methodology section, junction capacity analysis was not within the scope of this capacity assessment. However, the key junctions that may be adversely affected by the traffic generated by the development site include:

- A473 / Woodlands signalised junction
- A473 / A4119 roundabout
- A473 / A4222 signalised junction

- A473 / Talbot Road signalised junction
- A473 / Tonteg Road signalised junction
- A4054 / A470 roundabout (grade separated)
- A4119 / M4 roundabout (grade separated)

These should be tested in terms of their operational capacity in future studies.

6.6.9 Sustainable Transport Assessment

Bus Service Provision

An hourly bus service (No.244) is operated by Stagecoach and links Beddau to Pontypridd in the east and Bridgend in the west. The nearest existing stop is located on the southern boundary of the site on Woodlands. There is no shelter, but a flag, pole and timetable are provided.

This service could be improved to serve the strategic development site by increasing it to a half-hourly service, possibly only during peak hours, with a new bus-stop located within the development site for easier access. This could reduce car-dependency in this area and increase modal shift, thereby reducing the impact of the development on local and strategic roads. A bus capacity assessment would need to be conducted in order to establish whether the existing capacity provision will meet the predicted demand from the future development.

In order to promote sustainable travel, the process of 'pump priming' should be introduced prior to any new redevelopment occurring within the site. Bus services should be introduced prior to any occupation begins, so that people travelling to or from the site have a choice of travel mode from day one and before travel habits / patterns emerge.

Rail Service Provision

The nearest railway station is located in Treforest, from where Arriva Trains Cymru operates train services to Cardiff. There are footways provided on both sides of the carriageway from the site to the station and they benefit from street lighting along their length. However, Treforest station is approximately 5km from the development site and this is considered too far to walk based on Institute of Highways and Transportation guidance on walking distances to public transport facilities. There are however buses that link Beddau to the Treforest railway station, namely services 100 and 244.

There are approximately 6 services per hour from Treforest to Cardiff and as such, is considered to be a good level of service frequency. Further studies should be conducted in order to establish the level of capacity on these existing services; and whether they can accommodate any increased patronage from the potential redevelopment of the strategic development site. This can reduce the number of car trips and lessen the impact on the strategic highway network. A direct shuttle bus linking the site with the rail

services at Treforest could be provided by future developers as part of the pump priming process, as previously mentioned.

Provision for Cyclists and Pedestrians

Pedestrians are well catered for along Woodlands, where there are generous width footways on either side of the carriageway, good street lighting and an uncontrolled zebra crossing facility. There is a footway along the western side of the carriageway only, on the 'unnamed' road that joins Woodlands Road to the development site. There is scope however for future developers of the site to provide a footway/cycleway along the eastern side of the carriageway, thereby increasing accessibility.

There is little cycle infrastructure in the local area and no dedicated cycle routes. Future redevelopment of this site should include a local pedestrian and cycle access strategy that will integrate the development into the existing urban settlement.

6.6.10 Summary

- Any future redevelopment of the site should ensure that the site is an extension of the existing urban settlement and not segregated by any physical boundaries. Integration with the existing urban settlement will ease accessibility and encourage sustainable transport use, thereby reducing demand on the RCT strategic highway network.
- The capacity assessment of the key links has demonstrated that forecast traffic generation from the proposed redevelopment at this site will have a significant impact on the A473. It is therefore suggested that further transport corridor studies are required to manage this additional increase in traffic. It is envisaged that the Church Village bypass scheme will aid in this. Further studies will be required to ascertain whether the additional traffic will impact upon the operational performance of the key junctions on the strategic highway network and other localised minor roads.
- A comprehensive Masterplan must be devised at an early stage of this site's redevelopment design process to maximise accessibility by all modes of transport.
- A Travel Plan should be agreed prior to first occupation of the redevelopment. This is to ensure that RCT can utilise developer contributions to fund a pump priming process which will influence travel choice and promote sustainable modes.

6.7 Site 7 – Mwyndy / Talbot Green Area

6.7.1 Site Location and Description

The Mwyndy / Talbot Green Strategic Development Site is located on the southern periphery of Llantrisant and is approximately 352 hectares in size. The site is bounded to the north by the A473, to the east and south by fields and to the west by the urban area of Llantrisant.

The site generally consists of green fields and is bisected from north to south by the A4119 and from east to west by the River Clun.

An aerial photograph depicting the development site, its surrounding area and local transport facilities is illustrated below.



6.7.2 Local Highway Network and Existing Site Access

The A473 and A4119 are both located within close proximity of the development site and both form part of the RCT Strategic Road Network. The A4119 is a dual 2-lane carriageway that links Llantrisant with the M4 motorway to the south and Tonyrefail to the north. It has been noted that from on-site observations and perusal of existing Transport Assessments

that the A4119 has existing congestion problems that will need to be addressed in the near future.

The A473, a single carriageway, intersects the A4119 just to the north of the development site and links Llantrisant with Church Village to the east and Bridgend to the west.

This predominantly greenfield site has no significant access points, only some minor informal T-junction arrangements with local roads.

6.7.3 Local Highway Improvement Schemes

The Church Village Bypass scheme will have an impact on the movement of vehicles to and from this strategic development site. Improved journey times and reliability of congestion levels may cause traffic travelling from the Pontypridd area to the Cardiff area not to use the A470 and M4, but to utilise this new road which should be a more direct and free-flowing route.

6.7.4 Future Site Redevelopment

It is necessary to establish the potential level of development so that traffic generation can be forecast. It is envisaged that the future redevelopment of this site is likely to consist of a mix of employment and residential uses.

It is considered that only 40% of the total site area will be viable for future development due to local topographical conditions, which equates to approximately 211 Hectares of developable area. The Gross Floor Area (GFA) of buildings generally equates to 40% of the developable area for employment uses. As such, a GFA of 40% has been used in this assessment to calculate the developable area on this site. Residential development has been calculated at an average density of 40 dwellings per hectare.

To this end, it has been assumed for the purposes of this assessment that the level of future redevelopment at this site could include 800 residential dwellings, 70,000 m² of retail, 45,000 m² leisure and 100,000 m² employment uses. The leisure element has been split into a 15,000 m² Leisure centre, 15,000 m² Cinema and a 15,000 m² bowling alley and retail element further divided in to a 55,000 m² retail park and 15,000 m² superstore.

6.7.5 Trip Generation

Table 6.19 illustrates the trip rates that could occur at the development site during the AM and PM highway peak hours, as predicted by TRICS. **Table 6.20** illustrates the traffic generation that would occur at the site as a result of the proposed development during the AM and PM highway peak hours, as predicted by TRICS. These figures are based on the development of 800 residential dwellings, 15,000 m² Leisure centre, 15,000 m² Cinema a

15,000 m² bowling alley, a 55,000 m² retail park, 15,000 m² superstore and a 100,000 m² employment business park on this site.

Table 6.19 – Mwyndy trip rates				
Land Use	Period	Arrivals	Departures	Two-way
Retail Park	AM	0.539	0.265	0.804
	PM	1.224	1.339	2.563
Employment Bus. Park	AM	1.037	0.146	1.183
	PM	0.125	0.852	0.977
Leisure (centre)	AM	0.566	0.478	1.044
	PM	1.263	1.097	2.360
Leisure (cinema)	AM	0.000	0.000	0.000
	PM	2.394	2.274	4.668
Leisure (bowling)	AM	0.000	0.000	0.000
	PM	0.600	0.600	1.200
Residential	AM	0.147	0.646	0.793
	PM	0.546	0.237	0.783
Commercial (supermarket)	AM	3.990	2.434	6.424
	PM	7.041	7.281	14.322

Table 6.20 – Mwyndy traffic generation				
Land Use	Period	Arrivals	Departures	Two-way
Retail Park	AM	297	146	443
	PM	673	737	1410
Employment Bus. Park	AM	1037	146	1183
	PM	125	852	977
Leisure (centre)	AM	85	72	157
	PM	190	165	355
Leisure (cinema)	AM	0	0	0
	PM	359	341	700
Leisure (bowling)	AM	0	0	0
	PM	90	90	180
Residential	AM	118	517	635
	PM	437	190	627
Commercial (supermarket)	AM	599	365	964
	PM	1056	1092	2148
Total	AM	2136	1246	3382
	PM	2930	3467	6397

The PM peak hour trips are much larger than the AM peak hour trips because the commercial and some of the leisure elements will not be open during this period and as such, does not attract any traffic.

6.7.6 Strategic Highway Assessment

The gravity model has been used to calculate the impact of forecast traffic on the strategic highway network, resulting from the redevelopment of the Mwyndy strategic development site. **Figures 6.37** and **6.38** illustrate the AM and PM development traffic distribution, **Figures 6.39** and **6.40** illustrate the highway network traffic volumes and **Figures 6.41** and **6.42** illustrate the AM and PM development traffic percentage impact on the strategic highway network.

The strategic roads most affected by the proposed redevelopment of the Mwyndy site will be the A4119, A473 and A468.

The percentage impact from the development on the A4119 varies between 6-17% in the AM and 10-37% in the PM peak hour, which represents a low to medium level of growth on this part of the strategic road network.

The percentage impact from the development on the A473 varies between 0-25% in the AM and 0-46% in the PM peak hour, which represents a low to medium level of growth on this part of the strategic road network.

The percentage impact from the development on the A468 varies between 8-13% in the AM and 17-21% in the PM peak hour, which represents a low level of growth on this part of the strategic road network.

Also significantly affected will be the M4 Motorway, by as much as 20% in the AM peak hour and 36% in the PM peak hour. The development traffic is therefore likely to cause congestion and queues at Junction 34, which would need to be addressed.

The percentage increases from the development on all other strategic roads is generally less than 10% in both the AM and PM peak hours; and therefore is not considered to be an issue.

Table 6.21 summarises the highway links most affected by the 2025 baseline traffic flows with Mwyndy development site traffic and compares them to the theoretical capacity of the highway. The cells highlighted in red indicate links that will be operating with less than 5% capacity, or over capacity. Whilst cells highlighted in orange indicate links that will be operating with less than 20% capacity remaining.

Table 6.21 demonstrates that although the Mwyndy site traffic has a low to medium percentage impact on the A473, A4119 and M4, the (base + development) traffic flows are approaching or above the theoretical capacity level on many of these links. Therefore it will be necessary to further investigate highways and sustainable transportation improvements along these transport 'corridors', so that the future redevelopment of this site does not compound the existing congestion problems.

Table 6.21 – Mwyndy forecast traffic volumes					
Road	Total No. of Lanes	Road Type	Capacity as per TA 79/99	Predicted 2025 Base Flows	
				AM	PM
A468	4	UAP1	3600	2291 (E)	2613 (E)
				2338 (W)	2615 (W)
A473	2	UAP2	1470	1172 (E)	1792 (E)
				1552 (W)	1305 (W)
A4119 (Section between Llantrisant and Tonypanydy)	2	UAP1	1590	1043 (N)	1997 (N)
				1573 (S)	1176 (S)
A4119 (Section between M4 and Llantrisant)	4	UAP1	3600	3527 (N)	4099 (N)
				2874 (S)	4126 (S)
M4	6	UM	5600	6862 (E)	6064 (E)
				5930 (W)	7851 (W)

Note: TA 79/99 Capacity is shown per direction

The A468 is shown to operate within capacity in 2025 and as such, no upgrades are considered necessary on these highway links as part of the redevelopment of the Mwyndy site. However, further studies into the operational performance of key junctions may still be required.

6.7.7 Proposed Site Access

The proposed means of accessing the site will depend on the location of each of the development types within the site and a comprehensive Masterplan. However it is apparent that the scale of development proposed will be associated with a substantial amount of additional traffic. This will significantly impact on the local strategic highway network and extensive further studies into the performance of local junctions will be required before any future redevelopment can commence.

Primary access to a development of this size will require a large primary access point that is capable of accommodating development traffic and peak hour traffic volumes. Further investigations into the nature and form of junction required, but it is likely to require the modification of the A473 / A4119 roundabout to include signals and possibly even grade separation.

Further assessment of the local area would suggest that secondary access could be achieved from the two existing roundabouts located on the north-eastern and north-western sections of the site boundary on the A473. The north-eastern roundabout does not currently have a southern arm but could very easily be converted to accommodate one. The north-western roundabout does have an existing southern arm, known locally as Rhiwsaeson Road, however it is only a minor carriageway that appears rural in nature and carries very little traffic. This roundabout could easily be

modified to add a more substantial arm that could accommodate a proportion of the proposed development traffic.

Pedestrian and cycle access points should also be considered and if possible kept segregated from the high levels of vehicular traffic. Care should also be taken to ensure that the routes are safe, convenient and link to existing urban settlements.

6.7.8 Key Junctions

As stated in the methodology section, junction capacity analysis was not within the scope of this capacity assessment. However, the key junctions that may be adversely affected by the traffic generated by the development site include:

- A473 / A4119 roundabout
- A473 / Penprysg Road roundabout
- A473 / A4222 signalised junction
- A473 / Woodlands signalised junction
- A473 / Tonteg Road
- A4054 / A470 roundabout (grade separated)
- A4119 / Talbot Road
- A4119 / A4093 roundabout
- J34 M4 motorway
- J35 M4 motorway

These should be tested in terms of their operational capacity in future studies.

6.7.9 Sustainable Transport Assessment

Bus Service Provision

Bus service No.122 is operated by Stagecoach with a frequency of 3 buses per hour, in either direction along the A4222. This service links the development site area to Tonypanyd in the north and Cardiff to the south.

The nearest existing stop is located on the A4222 Cowbridge Road, approximately 20m from the development site. This service could be improved to serve the strategic development site by constructing new bus stops within the development site for easier access. This could reduce car-dependency in the area and increase modal shift, thereby reducing the impact of the development on local and strategic roads. A bus capacity assessment would need to be conducted in order to establish whether the existing capacity provision will meet the predicted demand from the future development.

It is conceivable that a development of this nature and size could command its own public transport network and could act as a local transport hub with buses servicing the site from local and regional settlements.

In order to promote sustainable travel, the process of 'pump priming' should be introduced prior to any new redevelopment occurring within the site. Bus services should be introduced prior to any occupation begins, so that people travelling to or from the site have a choice of travel mode from day one and before travel habits / patterns emerge.

Rail Service Provision

Arriva Trains Cymru operates an hourly train service from Pontyclun to Cardiff in the east and Swansea in the west. Pontyclun Station is approximately 1km from the western periphery of the development site. This is considered to be a reasonable walking distance for a relatively fit person and is within the walking distance guidance provided by The Institute of Highways and Transportation, which states that 1.2km is the preferred maximum. Pedestrians would have a fairly direct route through the streets of Pontyclun to the station and there are footways provided on both sides of the carriageway which benefit from street lighting along its length.

It would be beneficial for the development to be served by more rail services per hour to improve the sustainable linkages. However, the Pontyclun rail service runs on the Cardiff-Swansea main line and as such, further studies will be required to ascertain whether any additional capacity can be provided as the line accommodates a lot of rail traffic, both passenger and freight. It could be possible to increase the number of carriages per train, especially during peak hours, to provide more capacity to meet the potential extra demand from the redevelopment. This could reduce the number of car trips and lessen the impact on the strategic highway network. It is recommended that further studies should also be conducted to verify whether there is sufficient capacity on existing train services to accommodate any increased patronage from the redevelopment of the Mwyndy strategic site.

Provision for Cyclists and Pedestrians

There is little existing infrastructure for cyclists in the local area and so this should be a major consideration during the planning stage of any future redevelopment of this strategic development site.

Future developers should seek to provide direct and convenient footway/cycleways through the site and connect with existing urban settlements, making the site as permeable as possible to promote sustainable transport modes, thereby reducing the impact on the strategic highway network.

6.7.10 Summary

- Any future redevelopment of the site should ensure that the site is an extension of the existing urban settlement and not segregated by any physical boundaries. Integration with the existing urban settlement will ease accessibility and encourage sustainable transport use, thereby reducing demand on the RCT strategic highway network.
- The capacity assessment of the key links has demonstrated that forecast traffic generation from the proposed redevelopment at this site will have a significant impact on the A473, A4119, A468 and M4 motorway. Apart from the A468, which will operate within capacity in 2025, all other highways will require further transport corridor studies to determine the best way to manage the additional increase in traffic, borne from the redevelopment of this site. Although some of the highways will be operating over capacity under base traffic loading in 2025, it is considered that the traffic generation from this site is significant enough to cause severe congestion and warrant further studies. Further studies will also be required to ascertain whether the additional traffic will impact upon the operational performance of the key junctions on the strategic highway network.
- A comprehensive Masterplan must be devised at an early stage of this site's redevelopment design process to maximise accessibility by all modes of transport.
- A Travel Plan should be agreed prior to first occupation of the redevelopment.
- Consideration should be given to 'pump priming' prior to first occupation.

6.8 Site 8 – Former Open Cast Colliery, Llanilid

6.8.1 Site Location and Description

The Llanilid strategic development site is located on the former Open Cast Colliery (OCC) site and is approximately 409 hectares in size. The site is bounded to the north by the A473, to the east by Llanharan Road, to the south by the M4 motorway and to the west by fields used for farming.

Although all of the colliery infrastructure has now been removed, the current topography still reflects the site's previous use, however major ground works are currently underway to prepare the development site for future construction of a film studios and associated leisure faculties that has recently been granted planning consent.

An aerial photograph depicting the development site, its surrounding area and local transport facilities is illustrated below.



6.8.2 Local Highway Network and Existing Site Access

The A473 runs along the northern periphery of the development site and provides the site with direct access to Llanharan to the north, Talbot Green to the east and Junction 35 of the M4 motorway to the south. A new large

roundabout has recently been constructed to facilitate access onto the site from the A473 as part of the initial Film Studio works. An existing roundabout on the north-eastern periphery of the development site provides vehicular access, however further capacity assessments of these junctions will be required in order to ascertain whether they can accommodate the predicted future development traffic.

6.8.3 Local Highway Improvement Schemes

The film studio development proposals include the provision of a new M4 junction, J34A. This will provide direct access to the motorway for the film studio development and will relieve traffic congestion on the A473 and A4119. This junction and road has not been factored into the gravity model as construction is yet to commence and firm plans on its location and alignment have not yet been confirmed.

6.8.4 Future Site Redevelopment

It is necessary to establish the potential level of development so that traffic generation can be forecast. It is envisaged that the future redevelopment of this site is likely to consist of the proposed film studios and associated leisure uses with a residential element also.

After discussions with RCT, it has been assumed for the purposes of this assessment that the appropriate level of future redevelopment at this site could include 1700 residential dwellings as well as the proposed film studios and associated leisure facilities. Although this level of development will not occupy the entire site, it represents the maximum level of development considered appropriate for this location.

6.8.5 Trip Generation

Trip rate data has been obtained for the residential redevelopment part of the site from the Ove Arup & Partners Ltd Transport Assessment (December 2005) and is summarised in **Table 6.22**.

Table 6.22 – Llanilid trip rates				
Land Use	Period	Arrivals	Departures	Two-way
Residential	AM	0.147	0.646	0.793
	PM	0.546	0.237	0.783

Table 6.23 illustrates the traffic generation that would occur at the site as a result of the proposed development during the AM and PM highway peak hours. These figures are based on the development of 1700 residential dwellings and the traffic generation data for the proposed film studios and

associated leisure uses which has been obtained from the Veryards Transport Assessment (June 2002).

Table 6.23 – Llanilid traffic generation				
Land Use	Period	Arrivals	Departures	Two-way
Residential	AM	250	1098	1348
	PM	928	403	1331
Film Studios	AM	1989	357	2346
	PM	391	1925	2316
Total	AM	2239	1455	3694
	PM	1319	2328	3647

6.8.6 Strategic Highway Assessment

The gravity model has been used to calculate the impact of forecast traffic on the strategic highway network, resulting from the redevelopment of the Llanilid OCC strategic development site. **Figures 6.43** and **6.44** illustrate the AM and PM development traffic distribution, **Figures 6.45** and **6.46** illustrate the highway network traffic volumes and **Figures 6.47** and **6.48** illustrate the AM and PM development traffic percentage impact on the strategic highway network.

The strategic roads most affected by the proposed redevelopment of the Llanilid OCC site will include the A4119, A473 and M4. The percentage impact from the development on the A4119 varies between 5-27% in the AM and 5-27% in the PM peak hour, which represents a low to medium level of growth on this part of the strategic road network.

The percentage impact from the development on the A473, J35 to Talbot Green section varies between 57-209% in the AM and 47-209% in the PM peak hour, which represents a very high level of growth on this part of the strategic road network. The Talbot Green to Pontypridd section is also impacted upon, though to a level generally below 17% in both the AM and PM peak hours.

The percentage impact from the development on the M4 varies between 6-28% in both the AM and PM peak hours, which represents a low to medium level of growth on this part of the strategic road network.

The percentage increases from the development on all other strategic roads is generally less than 10% in both the AM and PM peak hours; and therefore is not considered to be an issue.

Table 6.24 summarises the highway links most affected by the 2025 baseline traffic flows with Llanilid OCC development site traffic and compares them to the theoretical capacity of the highway. The cells

highlighted in red indicate links that will be operating with less than 5% capacity, or over capacity. Whilst cells highlighted in orange indicate links that will be operating with less than 20% capacity remaining.

Table 6.24 – Llanilid forecast traffic volumes					
Road	Total No. of Lanes	Road Type	Capacity as per TA 79/99	Predicted 2025 Base Flows	
				AM	PM
A473	2	UAP2	1470	1915 (E)	1895 (E)
				1810 (W)	2092 (W)
A4119 (Section between Llantrisant and Tonypanydy)	2	UAP1	1590	998 (N)	1764 (N)
				1430 (S)	938 (S)
A4119 (Section between M4 and Llantrisant)	4	UAP1	3600	2574 (N)	2733 (N)
				2512 (S)	2698 (S)
M4	6	UM	5600	6638 (E)	5058 (E)
				5485 (W)	6811 (W)

Note: TA 79/99 Capacity is shown per direction

Table 6.24 demonstrates that as the Llanilid site development is considerably large, then the associated traffic will have a large percentage impact on the A473 and M4 motorway. The (base + development) traffic flows are above the theoretical capacity level of each of the links on the A473; and the M4 motorway. Therefore it will be necessary to further investigate highways and sustainable transportation improvements along the A473 and M4 ‘corridors’, so that the future redevelopment of this site does not compound the existing congestion problems.

The A4119 (M4 to Llantrisant section) will be approaching capacity southbound in the AM peak hour and will be operating above its theoretical capacity level northbound in the PM peak.

The A4119 (Llantrisant to Tonypanydy section) is shown to operate well within capacity in 2025 and as such, no upgrades are considered necessary on these highway links as part of the redevelopment of the Llanilid site. However, further studies into the operational performance of key junctions may still be required.

6.8.7 Proposed Site Access

Primary access for the film studios should be gained from a new link road to a new junction (34a) of the M4 motorway. This will assist in relieving the A473 of a significant proportion of the development and some background traffic.

Secondary access could be taken from the A473, specifically at the two existing roundabouts at the north-eastern and north-western corners of the development site boundary respectively.

A primary redevelopment objective of this site should be to link its internal street network to Bryn Y Cae, an existing housing development, to allow for ease of movement by pedestrians and cyclists. This proposal will allow the residential section of this redevelopment to take the form of an urban extension and not a segregated development.

6.8.8 Key Junctions

As stated in the methodology section, junction capacity analysis was not within the scope of this capacity assessment. However, the key junctions that may be adversely affected by the traffic generated by the development site include:

- A473 / Penprysg Road roundabout
- Junction 35 M4 motorway
- Junction 34 M4 motorway
- Proposed Junction 34a M4 motorway
- A473 / A4222 signalised junction
- A473 / A4119 roundabout
- A4119 / Talbot Road
- A4119 / A4093 roundabout
- A4119 / A4233 roundabout
- A473 / Woodlands signalised junction
- A473 / Tonteg Road
- A4054 / A470 roundabout (grade separated)

These should be tested in terms of their operational capacity in future studies.

6.8.9 Sustainable Transport Assessment

Bus Service Provision

An hourly bus service (No.45) is operated by Veolia Transport Cymru and links Llanilid to Llantrisant in the east and Bridgend in the west. The nearest existing stops are located on the northern boundary of the site in the village of Bryncae.

This service could be improved to serve the strategic development site by increasing it to a bi-hourly service, possibly only during peak hours, with new bus-stops located within the development site for easier access. This could reduce car-dependency in this area and increase modal shift, thereby reducing the impact of the development on local and strategic roads. A bus capacity assessment would need to be conducted in order to establish whether the existing capacity provision will meet the predicted demand from the future development.

In order to promote sustainable travel, the process of 'pump priming' should be introduced prior to any new redevelopment occurring within the site. Bus services should be introduced prior to any occupation begins, so that people travelling to or from the site have a choice of travel mode from day one and before travel habits / patterns emerge.

Rail Service Provision

Arriva Trains Cymru operates an hourly train services from Pencoed to Cardiff in the east and Swansea in the west. Pencoed station is approximately 1.8km from the western boundary of the development site and is linked via good width foot/cycleways that are generally street-lit. The Institute of Highways and Transportation guidelines state that 1.8km is too generally considered too far to walk. However, the site is connected to the railway station via the No.45 bus service as described above, although it is imperative that service frequency must improve.

It would be beneficial for the development to be served by more rail services on an hourly basis. However, the Pencoed rail service runs on the Cardiff-Swansea main line and as such, further studies will be required to ascertain whether any additional capacity can be provided as the line already accommodates high volumes of existing rail traffic, both passenger and freight. It could be possible to increase the number of carriages per train, especially during peak hours, to provide more capacity to meet the potential extra demand from the redevelopment. This could reduce the number of car trips and lessen the impact on the strategic highway network. It is recommended that further studies should also be conducted to verify whether there is sufficient capacity on existing train services to accommodate any increased patronage from the redevelopment of the Llanilid strategic site.

Provision for Cyclists and Pedestrians

There are footway adjoining the development site to Llanharan in the north and Pencoed in the south, however there is very little local cycle infrastructure and no dedicated cycle routes. Future developers should therefore seek to provide direct and convenient footway/cycleways through the site and to converge with existing urban settlements, making the site as permeable as possible to promote sustainable transport modes, thereby reducing the impact on the strategic highway network.

6.8.10 Summary

- Any future redevelopment of the site should ensure that the site is an extension of the existing urban settlement and not segregated by any physical boundaries. Integration with the existing urban settlement will ease accessibility and encourage sustainable transport use, thereby reducing demand on the RCT strategic highway network.
- The capacity assessment of the key links has demonstrated that forecast traffic generation from the proposed redevelopment at this site will have a significant impact on the A473, A4119 and M4

motorway. It is envisaged that the forecast traffic impact on the A473 will be alleviated by the construction of a new link road and a new motorway junction (34a) with the M4. This link has been proposed as part of the film studios development at this site and should be introduced before the redevelopment has been completed. It is considered that this new link road will reduce the forecast traffic impact on the A4119, between Llantrisant and the M4 motorway. However, there will still be a significant increase on the M4 motorway however and this must be addressed even if no redevelopment is to take place at this site.

- Further studies will be required to ascertain whether the additional traffic will impact upon the operational performance of the key junctions on the strategic highway network.
- A comprehensive Masterplan must be devised at an early stage of this site's redevelopment design process to maximise accessibility by all modes of transport.
- A Travel Plan should be agreed prior to first occupation of the redevelopment.
- Consideration should be given to 'pump priming' prior to first occupation.

7 Cumulative Strategic Development Site Impact

7.1 Cumulative Assessment

This section of the report has considered the total directional flows across the network in the event that all of the eight strategic sites are fully developed. The RCT strategic highway network has been assessed for predicted capacity levels in the year 2025. The predicted 2025 traffic flows on each of the highways include the likely traffic generation from each of the eight strategic development sites, distributed by a gravity model; and existing traffic survey data that has been growthed up using TEMPRO adjusted NRTF factors.

Figures 7.1 and **7.2** illustrate the AM and PM total development traffic distribution, **Figures 7.3** and **7.4** illustrate the highway network total traffic volumes and **Figures 7.5** and **7.6** illustrate the AM and PM total development traffic percentage impact on the strategic highway network.

The percentage impact on the strategic highway network varies between 0-219% in the AM peak hour and 0-230% in the PM peak hour. This is a large variation in impact size, from very low to very high. It is apparent however, that most of the high level of impact can be seen in and around the upper Rhondda Valleys, Aberdare, Hirwaun and Talbot Green. This is due in part to the traffic flows being relatively low in some parts of the network; but merely due in part to the largest strategic development sites and largest trip generators, being located in these areas.

Table 7.1 summarises the maximum 2025 baseline traffic flows and the maximum 2025 Base + development traffic flows, per strategic highway, compared to the theoretical capacity as predicted in TA 79/99. The A465 and A4119 have been split into two sections each due to the different sections having a variation in the number of lanes provided.

The cells that are highlighted in red indicate roads, or sections of road, that are over capacity and will require remedial measures to provide new or upgraded roads to cope with this additional traffic, or measures introduced to significantly reduce the level of traffic.

Cells that are highlighted in orange indicate roads, or sections of road, that have less than 20% capacity remaining. It is likely that they will require some remedial measures at major junctions and 'bottle-necks' to ensure traffic flow remains as efficient as possible on these links.

Table 7.1 – RCT Strategic highway capacity by road type

Road	Total No. of Lanes	Road Type	Capacity as per TA 79/99	Predicted 2025 Baseline Flows		Predicted 2025 Base + development flows	
				AM	PM	AM	PM
A465 Hirwaun to Merthyr	2-3	UAP1	2010	1117 (E)	1097 (E)	2040 (E)	3330 (E)
				1146 (W)	1160 (W)	3644 (W)	2110 (W)
A465 Hirwaun to Neath	4	UAP1	3600	960 (E)	970 (E)	1232 (E)	1125 (E)
				895 (W)	1028 (W)	1046 (W)	1293 (W)
A468	4	UAP1	3600	2130 (E)	2163 (E)	2670 (E)	2994 (E)
				2061 (W)	2234 (W)	2728 (W)	2933 (W)
A470	4	UAP1	3600	4310 (N)	4543 (N)	4933 (N)	5460 (N)
				3716 (S)	3745 (S)	4419 (S)	4611 (S)
A473	2	UAP2	1470	1048 (E)	1448 (E)	1915 (E)	2220 (E)
				1340 (W)	1142 (W)	1869 (W)	2092 (W)
A4059	2	UAP2	1470	1131 (N)	1228 (N)	2338 (N)	1849 (N)
				1194 (S)	1215 (S)	1750 (S)	2391 (S)
A4061	2	UAP2	1470	493 (N)	641 (N)	894 (N)	1156 (N)
				576 (S)	535 (S)	1066 (S)	1009 (S)
A4093	2	UAP2	1470	260 (E)	449 (E)	271 (E)	458 (E)
				308 (W)	302 (W)	314 (W)	316 (W)
A4119 (Section between M4 and Llantrisant)	4	UAP1	3600	2027 (N)	2411 (N)	4027 (N)	4617 (N)
				2156 (S)	2129 (S)	3492 (S)	4888 (S)
A4119 (Section between Llantrisant and Tonypany)	2	UAP1	1590	907 (N)	1618 (N)	1167 (N)	2176 (N)
				1339 (S)	856 (S)	1698 (S)	291 (S)
A4232	4	UAP1	3600	2622 (N)	3731 (N)	2954 (N)	4067 (N)
				3696 (S)	2727 (S)	3924 (S)	3156 (S)
A4233	2	UAP2	1470	445 (N)	561 (N)	737 (N)	817 (N)
				543 (S)	507 (S)	727 (S)	846 (S)
M4	6	UM	5600	6283 (E)	4585 (E)	7408 (E)	6781 (E)
				4937 (W)	6488 (W)	6633 (W)	8314 (W)

Note: TA 79/99 Capacity is shown per direction

7.2 Cumulative Development Impact

The cumulative impact has investigated the forecast traffic arising from all eight strategic development sites. A breakdown of the anticipated implications on each link is shown below, however in general it is not surprising that redevelopment of this quantum is likely to have some serious implications on the highway network unless it is mitigated against properly from the outset.

As demonstrated in **Table 7.1**, the Hirwaun to Merthyr Tydfil section of the A465 Heads of the Valley road is forecast to operate well over capacity in 2025 with base and development traffic loading. The Welsh Assembly Government is currently considering plans for the A465 dual carriageway upgrade from Merthyr Tydfil to Hirwaun. This upgrade scheme on this section of road should then be able to accommodate the proposed level of base and development traffic in 2025. The upgrade may also draw trips from other parts of the network as driver choice is influenced significantly by perceived and actual levels of congestion.

This assessment has demonstrated that the A465 from Hirwaun to Neath and the A468 from Taffs Well to Caerphilly remain largely unaffected by the proposed redevelopment of the eight strategic development sites. Both highways have a significant amount of reserve capacity.

The A470 will be significantly over its capacity level in both directions in the year 2025, through background traffic growth over this period. This is unsurprising given the congestion that is currently experienced on this carriageway. The redevelopment of the eight strategic development sites will serve only to exacerbate this situation. The A470 is one of the most important roads within the RCT County Borough and as such this capacity issue must be addressed before levels of congestion restrict economic growth in this region. Further studies will be required in order to address the capacity problem facing this important commuter transport corridor. The situation may be aided by the construction of the Church Village bypass which will speed up the journey time from the A470 to Talbot Green and the M4 motorway, thereby allowing traffic travelling west to bypass Junction 32 (A470/M4), which is the busiest section.

There is a relatively large impact upon the A4059 from development traffic and it is demonstrated to operate within capacity under 2025 base traffic loadings. It is considered that there may be less demand on this road if the Aberdare bypass extension were to be built in combination with the A465 Merthyr Tydfil to Hirwaun Dual carriageway upgrade scheme. Traffic from Aberdare and its surrounding settlements could then travel on higher capacity roads from Aberdare to Merthyr Tydfil and then south to Abercynon. It is recommended that further studies be conducted into the most appropriate method of managing future additional traffic from the upper Cynon Valley.

In addition, the A473 is forecast to be significantly affected by the development proposals, particularly at Mwyndy and Llanilid. Whilst the proposed new M4 motorway junction (at Llanilid) may relieve the network in

this area, we recommend that further studies are required to take this into consideration and to advise whether any additional improvements are necessary.

The A4119 and M4 motorway are also significantly affected by the development traffic generated by the proposed redevelopments at Mwyndy and Llanilid strategic sites. A further study would be beneficial to ascertain whether any remedial highway and sustainable transport works can ameliorate the high level of impact on the A473, A4119 and M4 motorway; or whether this extensive level of redevelopment should be permitted in such close proximity to each other.

The A4232 has been demonstrated to operate beyond its capacity level under baseline conditions in 2025. The traffic generation from the strategic development sites will exacerbate this problem further without significant mitigation measures to manage this additional traffic.

The A4233 and A4061 operate well with capacity in all scenarios in 2025. Future redevelopment may be further aided by the delivery of the Upper Rhondda Fach upgrade scheme. This is an extension to the Lower Rhondda Fach scheme (Porth bypass) that has recently been completed and aims to provide a quicker and more reliable route through the Rhondda valleys, with less congestion and traffic passing through the town centres.

The strategic development site traffic will have a large impact between junctions 32 and 35 of the M4 motorway, following existing travel patterns that generally flow down from the valleys to the M4. In 2025, the M4 motorway will generally be operating close to or above its capacity level in either direction, under base traffic loading. This congestion issue will be exacerbated by the redevelopment of the strategic development sites, especially at Mwyndy and Llanilid. National Government guidance stipulates that development transport planning must move away from the 'predict and provide' method that has been used for new developments in the past and instead look to sustainable transport and land-use planning as a means of controlling traffic growth. To this end it is unlikely that even providing another lane in each direction of the M4 between these junctions will resolve the future capacity issues, therefore other methods of traffic growth restraint and key junction policy must be investigated.

7.3 Sustainable Transport

It is imperative to the future redevelopment of the strategic development sites that sufficient sustainable transport services and facilities are provided prior to first occupation. As the gravity model has demonstrated, many of the RCT strategic highways will be running close to or over capacity in the tested year of 2025, under base traffic loading only. Consequently the existing strategic highway arrangements will not be able to further accommodate the traffic forecast from the redeveloped strategic sites. Therefore it will be necessary to invest in upgrading sustainable transport infrastructure and improving service provision and service integration.

We would recommend that this is complemented via 'pump priming' of the site for 3-5 years to enable bus travel as an effective, efficient, well utilised form of transport. This will enable communities to have a choice of mode of travel prior to any travel habits emerging. It is much more difficult to convince people to change to sustainable transport after they have become accustomed to travelling somewhere by car.

Sustainable transport schemes such as the platform extensions, currently under construction, at many of the railway stations within the RCT County Borough are a positive step forward. However trains are still an unviable mode of transport for the majority of commuters due to proximity, price, reliability, journey time and convenience. Express services, which stop only at major stations along with increased frequency of services, must be a priority along important transport corridors such as the A470. Furthermore, if rail travel is to be encouraged, then it is important that the passenger is still considered once they have alighted from the train. Increased levels of integration between bus and rail services are imperative to any future increase in demand for rail travel and subsequent reduction in traffic.

It is crucial to the success of any of the strategic site redevelopments for there to be Travel Plans and Masterplan's devised at a conceptual stage to ensure that the level of additional generated traffic is kept to a minimum and sustainable transport accessibility is maximised.

Table 7.2 summarises the proposed highway and sustainable transport schemes that could be implemented with each of the strategic development sites to enhance their accessibility.

Table 7.2 – Strategic development site improvements matrix				
Strategic Site	Road Improvements - Existing	Road Improvements - Proposed	Sustainable Transport Improvements - Existing	Sustainable Transport Improvements - Proposed
Maerdy Colliery	<ul style="list-style-type: none"> Upper Rhondda Fach upgrade 	<ul style="list-style-type: none"> Integration with existing residential streets 	<ul style="list-style-type: none"> Treherbert line platform extension Increased Treherbert line services Treherbert station improvements 	<ul style="list-style-type: none"> Improved pedestrian and cycle access Increased bus services Express rail services Travel Plan Masterplan
Fernhill Colliery	<ul style="list-style-type: none"> Upper Rhondda Fach upgrade 	<ul style="list-style-type: none"> Integration with existing residential streets New link road to A4061 	<ul style="list-style-type: none"> Treherbert line platform extension Increased Treherbert line services Treherbert station improvements 	<ul style="list-style-type: none"> Improved pedestrian and cycle access Increased bus services Express rail services Travel Plan Masterplan
Phurnacite Plant	<ul style="list-style-type: none"> Aberdare Bypass Extension 	<ul style="list-style-type: none"> Integration with existing residential streets A4059 Mountain Ash improvements 	<ul style="list-style-type: none"> Aberdare line platform extension Aberdare station improvements 	<ul style="list-style-type: none"> Improved pedestrian and cycle access Increased bus services Express rail services Travel Plan Masterplan
Robertstown / Abernant	<ul style="list-style-type: none"> Aberdare Bypass Extension A465 Dualling 	<ul style="list-style-type: none"> Integration with existing residential streets A4059 Mountain Ash improvements 	<ul style="list-style-type: none"> Aberdare line platform extension Aberdare station improvements 	<ul style="list-style-type: none"> Improved pedestrian and cycle access Express rail services Travel Plan Masterplan
Land South of Hirwaun / Penywaun	<ul style="list-style-type: none"> A465 Dualling 	<ul style="list-style-type: none"> Integration with existing residential streets A4059 Mountain Ash improvements 		<ul style="list-style-type: none"> Improved pedestrian and cycle access Increased bus services Travel Plan Masterplan
Cwm Colliery and Coking Works	<ul style="list-style-type: none"> Church Village Bypass 	<ul style="list-style-type: none"> Integration with existing residential streets New link road from site to A473 	<ul style="list-style-type: none"> Beddau rail link reopening Taffs Well park and ride extension 	<ul style="list-style-type: none"> Improved pedestrian and cycle access Dedicated rail bus Increased rail services from Treforest Ind Est station Express rail services Travel Plan Masterplan
Mwyndy / Talbot Green	<ul style="list-style-type: none"> Church Village Bypass 	<ul style="list-style-type: none"> Integration with existing residential streets Major improvements to A473/A4119 junction 	<ul style="list-style-type: none"> Pontyclun park and ride extension Pontyclun station improvements 	<ul style="list-style-type: none"> Improved pedestrian and cycle access Express rail services Increased bus services Travel plan Masterplan
Llanilid OCC	<ul style="list-style-type: none"> New M4 Junction and Link 	<ul style="list-style-type: none"> Integration with existing residential streets 	<ul style="list-style-type: none"> Pontyclun park and ride extension Pontyclun station improvements 	<ul style="list-style-type: none"> Better pedestrian and cycle access Express rail services Increased bus services Travel Plan Masterplan

8 Funding Mechanisms

Welsh Office Circular 13/97 (Planning Obligations) identifies, in Paragraph B10, that appropriate contributions may be sought towards improvements outside the boundary of the proposed development site.

Development that might otherwise be refused consent because it adds to the area's transport problems may be permitted if an appropriate financial contribution is made to facilitate the completion of necessary transport schemes. The Local Authority will require contributions from any development, regardless of size or type, to secure funding for:

- improvements in transport infrastructure and services;
- transport corridor studies; and
- other requirements necessary to mitigate the impact of development

Planning obligations will be required, at the discretion of the Local Authority, to overcome the negative impacts that new development can place upon local communities and transportation network.

Use Class	Land Use	*Area 1	*Area 2
A1	Food (Superstores, local shops) & Non-Food retail (Superstore)	£30 per m ²	£15 per m ²
A2	Financial & Professional Services	£20 per m ²	£10 per m ²
B1	Business (Office & Business Park)	£25 per m ²	£15 per m ²
B2 & B8	General Industrial & Warehousing	£10 per m ²	Nil
C1	Hotels	£30 per m ²	£20 per m ²
C2	Residential Institutions	£10 per m ²	Nil
C3	Dwelling Houses (Privately owned and Flats)	£3,000 per dwelling	£2,000 per dwelling
C3	Social Housing	Nil	Nil
D1	Non-Residential Institutions (Clinics & GP Surgeries)	£25 per m ²	£15 per m ²
D2	Assembly & Leisure	£20 per m ²	£10 per m ²

Table 8.1 details the methodology that Hyder Consulting have suggested in a concurrent study, Supplementary Planning Guidance ‘*Access, Circulation and parking Requirements*’ (0001/NE02664/NER03 - Sept 07), for calculating an appropriate level of financial contribution from development (including extensions and conversions) throughout the County Borough. Area 1 would include principal towns and development sites located within close proximity to key junctions and key highway corridors throughout the County Borough. Area 2 would include all other parts of the County Borough. The strategic development sites would be included within Area 1 and could even have a higher premium again to pay for the necessary sustainable infrastructure. Developer contributions calculated in this way will be drawn upon to fund all types of necessary infrastructure improvements throughout the County Borough.

In arriving at a standard charge for new development (according to land use) it is acknowledged that this will benefit developers in the following ways:

- provide a clear understanding of the contributions that will be expected from their development at the earliest stage;
- speed up the planning process;
- fairly spread the cost of infrastructure over developments and should not burden early developers;
- reduce professional fees incurred by developers; and
- indicate to the developer what transport improvements may be enjoyed in the area which may be of considerable benefit to their particular site

Where a development is to be phased, it may be appropriate to link the provision of measures / development contributions accordingly – for example, funding local bus service improvements may be tied to the completion of a certain phase of a residential development scheme.

Where the combined impact of a number of developments creates the need for infrastructure, it may be reasonable for the associated developers’ contributions to be pooled, in order to allow the infrastructure to be secured in a fair and equitable way. Pooling can take place both between developments and between local authorities where there is a cross-authority impact.

An element of flexibility within the planning obligation framework will ensure that contributions are directed towards “improvements to public transport”, “measures to tackle traffic congestion” and “transport studies at key junctions and strategic corridors”.

In addition, many local authorities in the UK are now using financial penalties as the basis for encouraging sustainable travel through Travel

Plans. This is to ensure that a Travel Plan actually means something, rather than just being another document that people, especially occupiers/tenants forget.

It may be prudent to consider using some financial penalties linked to Travel Plans and modal split for the strategic development sites. This is summarised in **Table 8.2**.

Table 8.2 – Travel Plan penalties	
Deviation from Modal Split Targets for Reduction	Penalty Payout
0% to + 3%	£0
+3% to + 7%	£35,000
+7% to +10%	£50,000
> +10%	£75,000

Financial penalties of this order are certain to encourage the end user or developer to provide and promote sustainable linkages to a site.