

# **Hoover Site, Pentrebach**

Strategic Transport Assessment

October 2018

Mott MacDonald Mott MacDonald House 8-10 Sydenham Road Croydon CR0 2EE United Kingdom

T +44 (0)20 8774 2000 F +44 (0)20 8681 5706 mottmac.com

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#### 1

### 1 Introduction

#### 1.1 Overview

Mott MacDonald has been appointed by Transport for Wales to undertake a strategic transport assessment for the redevelopment of the former Hoover site in Pentrebach, Merthyr Tydfil.

The Merthyr Tydfil Replacement 'Deposit' Local Development Plan (2016-2031) seek to address a projected population decline by encouraging a sustainable level of population growth by directing development to Merthyr Tydfil and, in particular, to the 'Hoover Strategic Regeneration Area'.

An emerging development framework and masterplan sets out future development opportunity for the Hoover site and surrounding land in Pentrebach. This transport assessment has been prepared as a standalone review of the masterplan proposals.

The report considers development trips and highlights potential 'hot spots' where congestion may occur on the local highway network as a result of the proposals. It should be considered in relation to the masterplan, development framework and design principles produced by The Urbanists.

#### 1.2 Report Structure

This Strategic Transport Assessment covers the following:

- Section 2 considers the development location and provides information on the existing transport conditions and local highway network;
- Section 3 sets out development proposals;
- Section 4 provides a summary of the traffic surveys and existing traffic flows at key roads and junctions serving the development site;
- **Section 5** forecasts trip generation and distribution, and details the methodology used for assessing the impact of development traffic on the local highway network;
- Section 6 forecasts background traffic growth for the future years 2021 and 2031.
- Section 7 provides a high-level assessment of the impact of development traffic on the local highway network;
- Section 8 reviews the development proposals in relation to walking, cycling and public transport:
- Section 9 presents the conclusions of this report and recommends the next steps.

## 2 The Development Site

#### 2.1 Site Description

The proposed area of development is located towards the south of Merthyr Tydfil, adjacent to the river Taff, and consists of a number of land parcels across Ysgubor Newydd, Abercanaid and Pentrebach.

The location and site boundary is outlined in **Figure 1**. It includes a mixture of existing development, greenfield and brownfield land.

Figure 1: Site Location



Source: Mott MacDonald

#### 2.2 Local Highway Network

The site is broadly defined by four roads that border the development on all sides and include:

- the A470, a dual carriageway and key trunk road that connects Cardiff, Merthyr Tydfil and Brecon to mid and north Wales.
- the A4102, a single two-lane local road that passes north of the site and provides a direct connection from the A470 into Merthyr Tydfil town centre.
- the A4054 (Plymouth Street, Pentrebach Road and Merthyr Road) is a single two-lane local road, to the east of the site, which runs in a north-south direction parallel to the A470; and

 The A4060, a trunk road that is two-lane southbound, and one-lane north bound between the A470 and the A4054. It then continues as dual carriageway as far as the Heads of the Valley Road (A465).

In terms of location the site is well positioned in relation to the Strategic Highway Network, which provides direct access to major destinations in south east of Wales and beyond.

There are five key junctions connecting the above-mentioned roads, all of which take the form of a roundabout:

- A4054 / A4102 / Lower High Street / High Street
- A4054 (Pentrebach Rd) / Unnamed Rd (bridge to Abercanaid) / Hoover Access Rd (gated) / A4054 (Merthyr Rd) / Triangle Business Park Rd
- A4054 (Merthyr Rd) / A4060(n) / A4054 (Cardiff Rd) / A4060(s)
- A470(n) / A4060 / A470(s)
- A470(n) / A4102 / A470(s)

#### 2.3 Public Transport

#### 2.3.1 Rail

The development site is adjacent to the Merthyr Line and forms part of the wider Valleys Line network. Pentrebach Station is located within the development boundary, towards the southern edge of the site. Merthyr Tydfil Station is approximately 1.5km north, from the centre of the development site.

Merthyr Tydfil Station is the terminus of the Merthyr Line, which connects Merthyr Tydfil to Cardiff. Pentrebach Station is the next calling point with a journey time to Merthyr Station of approximately three minutes. From Monday to Saturday the stations receive a half hourly service, which then decreases to an hourly service in the evenings. On a Sunday there is one train every two hours. The journey time to Cardiff Central is approximately one hour.

#### 2.3.2 Bus

Bus stops are located along the A4054 (Plymouth St and Merthyr Rd) at regular intervals. Depending on where, within the site boundary, the walking distance to a stop varies between 500m-1500m.

A summary of the core services from the stops located on the A4054 is provided in **Table 1** and the bus stops and routes are shown in **Figure 2**.

**Table 1: Summary of Bus Services** 

Service No.	Route Details	Frequency (Mon-Sat)	Frequency (Sun)	Operator
78/79	Merthyr Tydfil –Treharris – Pontypridd	bph Merthyr Tydfil to Pontypridd     bph Merthyr Tydfil to Treharris.	No service	SC
78	Pontypridd – Treharris – Merthyr Tydfil	1 bph Pontypridd to Merthyr Tydfil 1 bph Treharris to Merthyr Tydfil	No service	SC
81	Bryngolau – Merthyr Tydfil	3 bph	No service	SC
81	Merthyr Tydfil – Bryngolau	3 bph	No service	SC
82	Merthyr Tydfil – Mount View	1 bph	No service	SC
82	Mount View – Merthyr Tydfil	1 bph	No service	SC
E79	Merthyr Tydfil –Treharris	5 evening services after 17:30. Freq. and route variable.	No service	NAT
S79	Merthyr Tydfil – Treharris – Bedlinog	Sun/BH service only.	5 per day. Irregular freq.	NAT
S79	Bedlinog – Merthyr Tydfil – Treharris	Sun/BH service only.	5 per day. Irregular freq.	NAT
S80	Merthyr Tydfil – Treharris	Sun/BH service only.		NAT
S80	Treharris – Merthyr Tydfil	Sun/BH service only.		NAT
X4	Abergavenny – Brynmawr – Ebbw Vale – Merthyr Tydfil – Cardiff	2 bph	No service	SC
X4	Cardiff – Merthyr Tydfil – Ebbw Vale – Brynmawr Abergavenny	2 bph	No service	SC
T4	Newton – Llandrindod Wells – Builth Wells – Brecon – Merthyr Tydfil - Cardiff	<ul><li>2 bph between Merthyr and Cardiff.</li><li>5 per day to Newtown.</li></ul>	No service south of Merthyr	SC
Т4	Cardiff – Merthyr Tydfil – Brecon – Builth Wells – Llandrindod Wells – Newton-	<ul><li>2 bph between Cardiff and Merthyr.</li><li>4 per day from Newtown.</li></ul>	No service south of Merthyr	SC
Course: Tro	volino Cymru, 2019	NAT - Navy Advantura Traval Ctar	00 bab baa	

Source: Traveline Cymru, 2018

NAT = New Adventure Travel, Stagecoach = SC, bph = buses per hour

Figure 2: Bus Stop Locations



Source: Mott MacDonald

(All bus services passing the site use Plymouth St and Merthyr Rd).

#### 2.4 Active Travel

Under the Active Travel (Wales) Act (2013) Local Authorities are required to map existing and proposed active travel routes. **Figure 3** is an excerpt from the Merthyr Tydfil County Borough Council Active Travel Map, showing the active travel routes in the vicinity of the Hoover site.

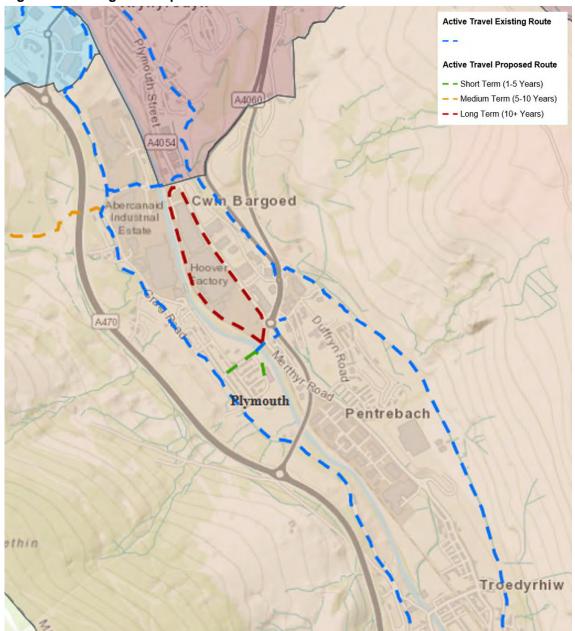


Figure 3: Existing and Proposed Active Travel Routes

Source: Merthyr Tydfil County Borough Council

### 3 Development Proposals

#### 3.1 Merthyr Tydfil Replacement Local Development Plan 2016 – 2031

Merthyr Tydfil County Borough Council is preparing a replacement Local Development Plan. The Deposit Plan sets out the aims for delivering sustainable development and the Hoover site allocation is considered a strategic regeneration area. Information included in the Deposit Plan and of relevance to this transport assessment includes:

- The Replacement LDP spatial strategy focuses on regeneration opportunities at the 'Hoover Strategic Regeneration Area' (HSRA) at Abercanaid/Pentrebach and the development of other smaller sites across the County Borough.
- A significant proportion of housing, new employment and local retail provision is to be located at the 'Hoover Strategic Regeneration Area' which will form a key part of the 'South Wales Metro' proposals.
- The focus of the LDP Strategy on the HSRA at Abercanaid/Pentrebach aims to ensure the regeneration of a significant brownfield site in Merthyr Tydfil that has been largely vacant for nearly 10 years. The regeneration of the site would build on opportunities provided by planned sustainable transport improvements, in particular improved train service frequency, improvements to Pentrebach station, park and ride facilities and potential future new metro station to the north of the HSRA. By focusing future development opportunities at the HSRA the Plan seeks to ensure the redevelopment of the former Hoover Factory site delivers on sustainable placemaking principles.

#### 3.2 Masterplan

A Framework Masterplan has been developed for the site by The Urbanists (planning and design consultants). The framework plan and supporting principles are provided in **Appendix A** and an overview of the masterplan in **Figure 4**.

The Masterplan includes:

- 441 residential units, to be located on the Hoover site (east of the river) between railway line and Merthyr Road, covering a total area of approximately 9.06 ha.
- three future development/opportunity sites (Dragon Parc, Triangle Land and Gethin Tip) located west of the river on brown and greenfield land, with a combined area of approximately 18.35 ha.
- 6.99 ha of employment land, of which sites A, B, C and D will be located west of the river (towards the north of the site) around existing employment. Site E is located east of the river and the proposed residential development, on the opposite side of Merthyr Road.
- 400 sqm of convenience retail space is proposed, the focus of which will be in the Triangle Land and the southern area of the Dragon Parc, which is envisaged to be the heart of the development.
- a site immediately south of the existing bridge and east of the railway line, which has been identified as a possible future Metro station.
- an 82-space Park & Ride car park and improvements to the existing Pentrebach Rail Station.
- 4.01 ha of open space (such as equipped play areas, teen provision and formal sport).

Land Budget Plan **#**gurbanists Drawing Number:

Figure 4: Hoover Site Masterplan

#### 3.3 Site Access

#### 3.3.1 Vehicles Access

Access to the development site (west of the Taff river) can only be gained via an existing highway bridge, which spans the river and railway, and connects into the five-arm roundabout junction with the A4054.

The bridge is a single lane two-way carriageway, with shared footway/cycleway provision on both sides. On the western side of the river the bridge leads directly into a smaller four-arm roundabout, providing access to existing development and Abercanaid village.

The masterplan proposes that the existing bridge will continue to provide the sole vehicular access to the development west of the river.

East of the river the masterplan proposes to service the main residential development via the Hoover Access Road, which is currently gated at the roundabout junction with the A4054. The road will take the form of a residential boulevard passing through the housing (running parallel with the river) before re-joining with the A4054 (Merthyr Rd) at the main Hoover entrance.

A third vehicle access is proposed for Employment Site (E) only, forming a new priority junction with the A4054 (Merthyr Rd), approximately 200m south of the five-arm roundabout

#### 3.3.2 Pedestrians & Cyclists

The masterplan (Figure 4) indicates good connectivity and permeability between different aspects of the development.

In addition to vehicular access the plan shows a north-south footway through a green area of the site, between residential properties and the River Taff, which links to Pentrebach Station and the existing footbridge at the southern end of the site.

Two new footbridges are proposed linking the east and west of the site, the first to be located close to the Triangle Land and the second opposite the potential Metro station.

The masterplan identifies key routes and corridors, which tie in with the existing and proposed active travel routes proposed by Merthyr Tydfil County Borough Council (**Figure 3**).

In summary the masterplan includes:

- a well-overlooked Active Travel Route within a green corridor in a north-south direction provides appropriate screening and buffer space towards the railway line.
- pedestrian and cycle movement through shared spaces and play streets with integral landscaping.
- a river corridor, with enhanced access for residential and visitors.
- making the Taff corridor an accessible feature of the area.
- opening up the riverside to create an accessible and pedestrian-friendly movement corridor.
- scope for a suspended footway to the western bank of river (viability concern).

## 4 Existing Traffic Flows

#### 4.1 Surveys

Several traffic surveys were undertaken on the surrounding highway network in the vicinity of the masterplan site, in May 2018. These include junction turning counts at five key roundabouts and automatic traffic counts (ATCs) at four locations.

All surveys were commissioned by Mott MacDonald and undertaken by Tracsis.

#### **4.1.1 Junction Turning Counts (JTC)**

Junction Turning Counts were collected on Tuesday the 22<sup>nd</sup> May 2018 for a twelve-hour period between 07:00 and 19:00. The survey locations are listed in **Table 2** and shown in **Figure 5**.

**Table 2: Hoover Site Junction Turning Count Locations** 

Ref No.	Survey Location	Junction Type
1	Lower High Street / High Street / A4102 / A4054	Roundabout
2	Pentrebach Road / Triangle Business Park Road / Merthyr Road / Unnamed Road (S) / Unnamed Road (N)	Roundabout
3	A4054 (N) / A4060 (N) / A4060 (S) / A4054 (S)	Roundabout
4	A4060 / A470 (S) / Unnamed Road / A470 (N)	Roundabout
5	A4102 / A470 (S) / Unnamed Road / A470 (N)	Roundabout

Source: Mott MacDonald

#### 4.1.2 Automatic Traffic Counts (ATC)

Automatic traffic count collected data was collected in the four locations listed in **Table 3** for one full week beginning Monday 21<sup>st</sup> May 2018, recording 24-hour two-way flows. **Figure 5** shows the ATC locations.

**Table 3: Hoover Site Automatic Traffic Count Locations** 

Ref No.	Survey Location		
1	Merthyr Road		
2	Pentrebach Road		
3	A4102		
4	A4054		

Source: Mott MacDonald

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Figure 5: Traffic Survey Locations

Source: Mott MacDonald

#### 4.2 Network Peak

Analysis of the traffic count data established that the AM and PM network peaks occur at 08:00-09:00 and 16:30-17:30 respectively.

#### 4.3 Base Traffic Flows

The peak hour traffic flows as recorded by the surveys are shown on network diagrams in **Appendix B**. The following sheets provide the AM and PM peak flows:

- 2018 Base Traffic Flows. AM Peak 08:00-09:00
- 2018 Base Traffic Flows. PM Peak 16:30-17:30

### 5 Development Trips

#### 5.1 Overview

This section of the report estimates the number of trips generated by the development proposals, how many of these trips will be made by private car (or van) and how they will distribute across the local highway network.

Due to the mixed-use nature of the development, assumptions have been made on land-use categories and the level of internal trips. Internal trips are when trips stay within the development site and do not travel on the local highway network, for example it is conceivable that some residents may live and work on the development site, or trips between leisure and retail maybe linked.

#### 5.2 Land Use Assumptions

The Land Budget Plan (**Appendix A**) identifies each section of the masterplan as residential or employment and specifies the number of residential units or area of employment. In addition, the Hoover factory site is divided into sub-sections of different types of housing.

In line with the requirements set out in the Merthyr Tydfil LDP it is assumed that 10% of the residential development will be affordable housing.

For the purpose of selecting appropriate trip generation rates, the employment sites are assumed to be business parks. This is considered to provide a robust estimation of the traffic generated.

#### 5.3 Trip Generation

Estimated person trip generation rates for each land use were extracted from the TRICS database, based on the area of employment land or type of housing units. **Table 4** presents the expected residential trip rates for each land use category.

Table 4: Development site person trips rates

AM (Arr)	AM (Dep)	AM (Total)	PM (Arr)	PM (Dep)	PM (Total)
0.223	0.77	0.98	0.584	0.306	0.864
0.342	1.184	1.526	0.667	0.57	1.237
0.198	0.521	0.666	0.3	0.211	1.237
0.264	0.412	0.676	0.385	0.291	0.609
1.612	0.205	1.826	0.176	1.184	1.315
	0.223 0.342 0.198 0.264	(Arr) (Dep)  0.223 0.77  0.342 1.184  0.198 0.521  0.264 0.412	(Arr)     (Dep)     (Total)       0.223     0.77     0.98       0.342     1.184     1.526       0.198     0.521     0.666       0.264     0.412     0.676	(Arr)     (Dep)     (Total)     (Arr)       0.223     0.77     0.98     0.584       0.342     1.184     1.526     0.667       0.198     0.521     0.666     0.3       0.264     0.412     0.676     0.385	(Arr)         (Dep)         (Total)         (Arr)         (Dep)           0.223         0.77         0.98         0.584         0.306           0.342         1.184         1.526         0.667         0.57           0.198         0.521         0.666         0.3         0.211           0.264         0.412         0.676         0.385         0.291

Source: Mott MacDonald

Trip rates are per dwelling or per 100sqm

The appropriate trips rates have been used to estimate the number of person trips for each development plot, which are presented in **Table 5**.

Table 5: Development site person trips generated

Site	Area (100sqm) or number of units	Land Use	AM (Arr)	AM (Dep)	PM (Arr)	PM (Dep)
Future Employment Site A	233	02B Business Park	375	47	41	275
Future Employment Site B	166	02B Business Park	267	34	29	196
Future Employment Site C	29	02B Business Park	46	5	5	34
Future Employment Site D	126	02B Business Park	203	25	22	149
Future Employment Site E	145	02B Business Park	233	29	25	171
Former Hoover Factory Zone 1	44	03C Flats privately owned	8	22	13	9
	22	03D Affordable/Local Authority Flats	5	9	8	6
Former Hoover Factory Zone 2	87	03A Houses privately owned	19	66	50	26
	40	03C Flats privately owned	7	20	12	8
Former Hoover Factory Zone 3	62	03A Houses privately owned	13	47	36	18
	22	03B Affordable/Local Authority Houses	7	26	14	12
Former Hoover Factory Zone 4	104	03A Houses privately owned	23	80	60	31
Former Hoover Factory Zone 5	60	03A Houses privately owned	13	46	35	18
Triangle Land	14	03A Houses privately owned	3	10	8	4
	2	03B Affordable/Local Authority Houses	1	2	1	1
Gethin Tip	40	03A Houses privately owned	8	30	23	12
	5	03B Affordable/Local Authority Houses	1	5	3	2
Dragon Park	247	03A Houses privately owned	55	190	144	75
	28	03B Affordable/Local Authority Houses	9	33	18	15

Source: Mott MacDonald

For the proposed Park and Ride, it is assumed that all 85 spaces are occupied during the day and that 75% of users arrive within the AM peak and depart within the PM peak. This adds a total of 64 vehicles to the network in each peak period.

Insufficient information is available to forecast trip rates for the proposed future Metro station. It has therefore been excluded from the trip generation exercise. If there is no associated parking with the potential Metro station, it is unlikely to generate additional vehicle trips. However, it is likely to alter the mode split of trips to and from this area of Merthyr Tydfil.

The total person trips generated by the developments within the masterplan area are presented in **Table 6**.

Table 6: Total person trip generation

	<b>AM Arrival</b>	AM Departure	PM Arrival	PM Departure
Residential	169	560	412	229
Employment	1127	143	123	828
Park and Ride	64	0	0	64
Total	1360	703	535	1120

Source: Mott MacDonald

#### 5.4 Existing Mode of Travel

The 2011 Census has been used to give an indication of how people travel. Census data relating to journey to work (QS701EW - Method of travel to work) has been obtained for Merthyr Tydfil and is provided in **Table 7** below.

Table 7: Census Journey to Work data 2011 (Merthyr Tydfil)

Method of Travel to Work	2011 Census
Work mainly at or from home	2.5%
Underground, metro, light rail, tram	0%
Train	2%
Bus, minibus or coach	7%
Taxi	1%
Motorcycle, scooter or moped	0%
Driving a car or van	66%
Passenger in a car or van	11%
Bicycle	0%
On foot	10%
Other	0.5%

Source: Census 2011

The data indicates that the predominant mode of travel is by car, with 77% of people driving or being a passenger in a car or van.

With the potential for a new Metro Station and the site being located close to Pentrebach Rail Station, it can be expected that the development proposals will likely achieve a more sustainable mode split.

#### 5.5 Trip Reduction

The masterplan is for mixed use develop and includes, residential, employment, retail and leisure. It is therefore assumed that a proportion of the trips will be internal and linked trips, for those who live and work in the development area. A reduction of 5% has been applied to the trip generation estimates to account for this.

A further 5% reduction has been applied to account for mode shift from car use to public transport because of the sustainable location and the proposed Metro station.

#### 5.6 Vehicle trips

The person trips for the development proposals (**Table 6**) were reduced to account for internal trips and improved sustainable travel provision. The person trips have then been converted into vehicle trips based on the travel to work mode split in **Table 7**. The resulting forecast development vehicle trips are provided in **Table 8**.

Table 8: Total vehicle trip generation

	<b>AM Arrival</b>	<b>AM Departure</b>	PM Arrival	PM Departure
Residential	109	359	265	146
Employment	777	99	85	571
Park and Ride	64	0	0	64
Total	950	458	349	781

Source: Mott MacDonald

#### 5.7 Journey to Work Origin/Destination

The distribution of development vehicles trips has been based on 2011 Census data. The 'Location of usual residence and place of work' datasets have been used to provide an indication of where people who live in Merthyr Tydfil usually work, and conversely where people who work in Merthyr Tydfil usually live.

**Table 9** provides a summary of the main origins/destination in relation to the development site and is used as the basis for distributing vehicle trips to and from the site.

Table 9: Direction of Traffic to/from Development Site

Direction	Main Destinations	% Split
North	Brecon, mid Wales	20%
	Northern Merthyr Tydfil	5%
	Central Merthyr Tydfil	5%
South	Aberfan, Merthyr Vale, Cardiff, M4 corridor	20%
East	Heads of the Valleys (East), Monmouthshire	20%
West	Heads of the Valleys (West), Neath, Swansea	30%

Source: Mott MacDonald

#### 5.8 Trip Distribution

For the purpose of distributing traffic, the development areas were split into five zones, corresponding to their entry point on to the local road network. Zones 1 and 2 are employment areas and Zones 3-5 are residential. The zones are shown in **Figure 6**.

Legend

Zone 1

Zone 2

Zone 3

Zone 4

Zone 5

Contain's OS data @ Crown, Copyright and database right 2018

**Figure 6: Development Zones** 

Source: Mott MacDonald

Route choice is based on primary routes and has been informed by local knowledge and internet journey planners.

The trips arriving at and departing from each zone were allocated to the most appropriate route between the zone and the destinations obtained from the census origin/destination data. The nature of the surrounding highway network means that there are broadly four main directions that traffic may take from the site. These are shown in **Table 10** and the routes illustrated in **Figure 8.** 

Table 10:Direction of Traffic to/from Development Site

Direction	<b>Main Destinations</b>	% Split	Route to/from site
North	Brecon, mid Wales	20%	Plymouth St - A4102 - A470(N)
	Northern Merthyr Tydfil	5%	Plymouth St - A4054
	Central Merthyr Tydfil	5%	Plymouth St - Lower High Street
South	Aberfan, Merthyr Vale, Cardiff, M4 corridor	20%	Merthyr Rd - A4060 - A470(S)
East	Heads of the Valleys (East), Monmouthshire	20%	Merthyr Rd - A4060
West	Heads of the Valleys (West), Neath, Swansea	30%	Plymouth St - A4102 - A470(N)

Source: Mott MacDonald

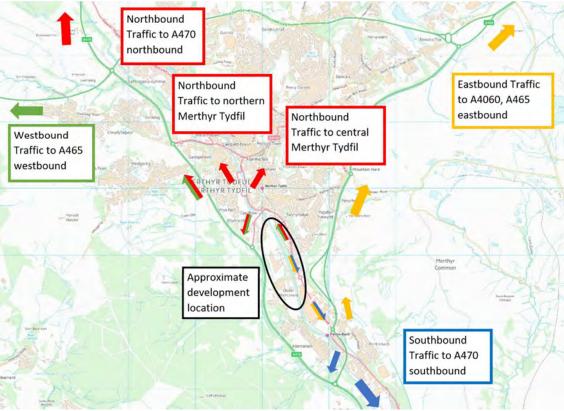


Figure 7: Route taken by development traffic

Source: Mott MacDonald

The impact of the development traffic on each of the key road links is shown in a series of network diagrams, which are included as **Appendix B**. The proportional distribution on to the network and vehicle numbers generated by each zone, and the total traffic flows generated by all zones combined, are presented on the following sheets:

- Zone 1 Traffic Distribution. AM Peak 08:00-09:00
- Zone 1 Traffic Distribution. PM Peak 16:30-17:30
- Zone 1 Traffic Flows. AM Peak 08:00-09:00
- Zone 1 Traffic Flows. PM Peak 16:30-17:30
- Zone 2 Traffic Distribution. AM Peak 08:00-09:00
- Zone 2 Traffic Distribution. PM Peak 16:30-17:30
- Zone 2 Traffic Flows. AM Peak 08:00-09:00
- Zone 2 Traffic Flows. PM Peak 16:30-17:30
- Zone 3 Traffic Distribution. AM Peak 08:00-09:00
- Zone 3 Traffic Distribution. PM Peak 16:30-17:30
- Zone 3 Traffic Flows. AM Peak 08:00-09:00
- Zone 3 Traffic Flows. PM Peak 16:30-17:30
- Zone 4 Traffic Distribution. AM Peak 08:00-09:00
- Zone 4 Traffic Distribution. PM Peak 16:30-17:30
- Zone 4 Traffic Flows. AM Peak 08:00-09:00
- Zone 4 Traffic Flows. PM Peak 16:30-17:30
- Zone 5 Traffic Distribution. AM Peak 08:00-09:00
- Zone 5 Traffic Distribution. PM Peak 16:30-17:30
- Zone 5 Traffic Flows. AM Peak 08:00-09:00
- Zone 5 Traffic Flows. PM Peak 16:30-17:30
- Total Development Flows. AM Peak 08:00-09:00
- Total Development Flows. PM Peak 16:30-17:30

### 6 Traffic Growth

#### 6.1 Overview

It is envisaged that development of the masterplan could start to take place by 2020. Future year traffic flows have therefore been calculated for 2021 (an assumed opening year) and 2031 (design year). The flows are based on the 2018 base traffic flows with the following adjustment:

 Application of National Trip End Model 7.2 trip end growth combined with National Transport Model (NTM) traffic growth forecasts.

This section provides details of the TEMPro growth factors used and the calculation of committed development traffic flows. The resultant future year do minimum traffic flows are shown in **Appendix B** for each of the five junctions under consideration.

#### **6.2 TEMPro Growth Factors**

TEMPro 7.2 was used to obtain traffic growth factors for the Merthyr Tydfil TEMPro zone, as shown in **Figure 8**. Growth rates for the entire Merthyr Tydfil authority were used as a robust estimate because they are slightly higher than Merthyr Tydfil 005, the zone local to the development.

The Black Mountains Pen y Fan 886m BRECON BEACONS Abei MERTHYR Brynamman Blaenavon edegan Pontardawe Abérdare 🏲 VSE TALBOT reorch Neath A483 Caerphill Port Pontyprid A468 Talbot Ne Legend Pencoed Merthyr Tydfil Tempro Zone right and database right 2018

Figure 8: Location of Area Merthyr Tydfil TEMPro v7.2

Source: Mott MacDonald

Using the 2018 base year, local growth factors were extracted for 2021 and 2031. The factors show growth expected rates of 4% - 5% by 2021 and approximately 14% by 2031.

All the TEMPro growth factors used are presented in Table 11.

**Table 11: Growth Factors** 

	Opening Year 2021	Design Year 2031
AM Peak	1.05	1.14
PM Peak	1.04	1.14

Source: Mott MacDonald

The forecast background traffic flows, excluding the proposed development, for the peak hour in 2021 and 2031 are provided in **Appendix B**, on the following sheets:

- 2021 Background Traffic Flows. AM Peak 08:00-09:00
- 2021 Background Traffic Flows. PM Peak 16:30-17:30
- 2031 Background Traffic Flows. AM Peak 08:00-09:00
- 2031 Background Traffic Flows. PM Peak 16:30-17:30

The total expected peak hour traffic flows on each link in 2021 and 2031 are presented on the following sheets in **Appendix B**, which add the forecast development traffic to these background traffic flows:

- 2021 Background + Development Traffic Flows. AM Peak 08:00-09:00
- 2021 Background + Development Traffic Flows. PM Peak 16:30-17:30
- 2031 Background + Development Traffic Flows. AM Peak 08:00-09:00
- 2031 Background + Development Traffic Flows. PM Peak 16:30-17:30

### 7 Strategic Highway Assessment

#### 7.1 Overview & Methodology

To understand the potential impact of development traffic on the local highway network, this assessment considers the capacity of highway links and the percentage impact at key junctions.

Junction capacity analysis and modelling does not form part of the scope of this transport assessment. However, consideration has been given to key junctions that are likely to be significantly impacted by development traffic. These junctions have been highlighted so that further studies or specific junction modelling can be undertaken to identify appropriate mitigating measures or improvement works.

Although it is unlikely, for the purposes of this assessment, it has been assumed that the masterplan site will be fully developed and occupied by 2021. In addition, the future year 2031 has also been assessed.

#### 7.2 Links

The Design Manual for Roads and Bridges has been used for peak hour carriageway capacity classifications, with each road being assigned a capacity level based on the relevant criteria.

An indication of capacities based on road type is provided in **Figure 9** as contained in the Design Manual for Roads and Bridges (DMRB) TA 79/99. The capacity can be used as a guide for urban roads and is defined as the maximum sustainable flow of traffic passing in one hour, under favourable road and traffic conditions.

Figure 9: Urban Link Capacities

	Two-way Single Carriageway- Busiest direction flow (Assumes a 60/40 directional split)										Dual Carriageway			
			Total number of Lanes									Number of Lanes in each direction		
		2 2-3 3 3-4						3-4	4	4+		2	3	4
Carriageway 6.1m width		6.1m	6.75m	7.3m	9.0m	10.0m	12.3m	13.5m	14.6m	18.0m	6.75m	7.3m	11.0m	14.6m
	UM		Not applicable								4000	5600	7200	
2002	UAP1	1020	1320	1590	1860	2010	2550	2800	3050	3300	3350	3600	5200	*
Road type	UAP2	1020	1260	1470	1550	1650	1700	1900	2100	2700	2950	3200	4800	*
75	UAP3	900	1110	1300	1530	1620	*	*	*	*	2300	2600	3300	*
	UAP4	750	900	1140	1320	1410	*	*	*	*	*	*	*	*

Source: Design Manual for Roads and Bridges (DMRB) TA 79/99

TA 46/97 provides guidance on rural roads and carriageway capacity can be estimated using the following relationship:

Capacity = 
$$[A - B \times Pk\%H]$$

Pk%H is the percentage of heavy vehicles in the peak hour. A and B are parameters dependant on road standard;

	Α	В
Single Carriageway	1380	15.0
Dual Carriageway	2100	20.0
Motorway	2300	25.0

A summary of the forecast traffic flows compared to the theoretical capacity is provided in **Table 12**. Flows highlighted in orange indicate roads that are operating between 90% and 100% of their theoretical capacity and are likely to suffer from congestion during busy periods. Flows highlighted in red are above 100% of their link capacity.

Table 12: Theoretical and Forecast Traffic Flows on Key Links

Road	No. Lanes	Road Type	Capacity (DMRB)	2018		20	21	2031		
				AM	PM	AM	PM	AM	PM	
A470 south of A4060 (northbound)	2	DAP1	4080	42.1%	38.0%	47.0%	41.2%	51.0%	44.9%	
A470 south of A4060 (southbound)	2	DAP1	4080	37.1%	39.6%	41.1%	45.0%	44.7%	48.8%	
A470 (northbound)	2	DAP1	4080	28.6%	27.8%	29.9%	29.1%	32.7%	31.8%	
A470 (southbound)	2	DAP1	4080	22.2%	25.8%	23.2%	27.0%	25.4%	29.5%	
A470 north of A4102 (northbound)	2	DAP1	4080	13.6%	31.6%	20.1%	41.9%	21.4%	45.0%	
A470 north of A4102 (southbound)	2	DAP1	4080	26.2%	26.6%	35.1%	32.3%	37.7%	34.8%	
A4120 (northbound)	1	UAP2	1470	38.9%	51.0%	65.6%	61.6%	69.4%	66.5%	
A4120 (southbound)	1	UAP2	1470	26.1%	46.1%	43.7%	72.9%	46.2%	77.3%	
High St / Plymouth St / Pentrebach Rd (northbound)	1	UAP3	1530	43.5%	58.0%	64.1%	89.2%	68.3%	94.7%	
High St / Plymouth St / Pentrebach Rd (southbound)	1	UAP3	1530	32.2%	79.9%	62.4%	97.7%	65.5%	105.4%	
Merthyr Road (northbound)	1	UAP2	1470	28.4%	28.6%	45.9%	43.9%	48.7%	46.6%	
Merthyr Road (southbound)	1	UAP2	1470	46.3%	49.5%	58.2%	64.5%	62.7%	69.2%	
A4060 (northbound)	1	UAP2	1650	48.3%	52.6%	57.9%	58.7%	62.5%	63.7%	
A4060 (southbound)	2	UAP2	3300	25.9%	24.8%	30.0%	30.3%	32.5%	32.7%	
A4060 north of A4054 (northbound)	2	UAP2	3200	14.1%	12.3%	16.3%	14.2%	17.6%	15.4%	
A4060 north of A4054 (southbound)	2	UAP2	3200	8.8%	13.1%	13.0%	15.6%	13.8%	16.8%	
A4054 (northbound)	1	UAP2	1470	37.5%	47.3%	39.2%	49.4%	42.8%	54.0%	
A4054 (southbound)	1	UAP2	1470	37.7%	51.0%	39.5%	53.3%	43.1%	58.2%	

Source: Mott MacDonald

DAP = Dual All Purpose (Rural); UAP = Urban All Purpose

High Street/Plymouth Street/Pentrebach Road is forecast to reach 100% capacity by 2031, this link is used by a large proportion of the development traffic and is subject to the greatest impact. The link has expected flows of more than 90% of its capacity in the PM peak heading southbound by 2021. By 2031 the demand is above 90% northbound and above 100% southbound.

Other links experiencing significant traffic flows include the A4210, which is expected to exceed 60% northbound and 70% southbound by 2021, reaching 67% and 77% respectively by 2031. Traffic flow on the Merthyr Road southbound will exceed 60% of its' capacity by 2021 and reach 69% by 2031. The A4060 northbound will exceed 60% of its capacity by 2031.

#### 7.3 Junctions

Traffic data at five key junctions, connecting the highway links, has been recorded for a typical weekday. **Table 13** to **Table 17** summarise the peak hour turning movements and the percentage impact of development traffic.

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

Table 13: Junction 1 - Lower High St/A4102/A4054/High St

Approach Arm	Flow							
	20	18	202	21	2031			
	AM	PM	AM	PM	AM	PM		
Lower High St	863	965	947	1027	1030	1119		
High Street	666	887	981	1364	1045	1449		
A4102	572	750	1094	906	1149	978		
A4054	491	675	558	724	605	788		
Total	2592	3277	3580	4020	3829	4335		
% Increase from 2018	-	-	38%	23%	48%	32%		

Source: Mott MacDonald

Table 14: Junction 2 - Triangle Business Park Road/Merthyr Road/Hoover Factory/Unnamed Road/Pentrebach Road

Approach Arm			Flo	W		
	20	18	202	21	2031	
	AM	PM	AM	PM	AM	PM
Triangle Business Park Rd	126	422	132	441	144	482
Merthyr Road	418	420	779	645	819	685
Hoover Factory	0	4	143	64	143	64
Unnamed Road	201	304	452	837	471	866
Pentrebach Road	492	1222	1110	1495	1157	1612
Total	1237	2372	2615	3481	2734	3709
% Increase from 2018	-	-	111%	47%	121%	56%

Source: Mott MacDonald

Table 15: Junction 3 - A4060/A4054/Merthyr Road

**Approach Arm Flow** 2018 2021 2031 **AM PM AM PM AM PM** A4060 southbound 281 418 468 498 495 538 A4060 northbound 797 868 1007 968 1084 1052 A4054 767 715 802 747 876 816 Merthyr Road 680 727 856 947 921 1017 **Total** 2525 2728 3133 3161 3375 3423 24% % Increase from 2018 16% 34% 25%

Source: Mott MacDonald

Table 16: Junction 4 - A4060/A470/Unnamed Road

Flow						
20	18	202	21	2031		
AM	PM	AM	PM	AM	PM	
856	817	992	1000	1074	1078	
1721	1562	1973	1694	2139	1844	
6	41	6	43	7	47	
906	1054	947	1101	1034	1203	
3489	3474	3919	3837	4254	4171	
		12%	10%	22%	20%	
	AM 856 1721 6 906	856     817       1721     1562       6     41       906     1054	2018     202       AM     PM     AM       856     817     992       1721     1562     1973       6     41     6       906     1054     947       3489     3474     3919	2018       AM     PM     AM     PM       856     817     992     1000       1721     1562     1973     1694       6     41     6     43       906     1054     947     1101       3489     3474     3919     3837	2018         2021         203           AM         PM         AM         PM         AM           856         817         992         1000         1074           1721         1562         1973         1694         2139           6         41         6         43         7           906         1054         947         1101         1034           3489         3474         3919         3837         4254	

Table 17: Junction 5 - A4120/A470/Unnamed Road

Approach Arm		Flow						
	201	18	20	21	2031			
	AM	PM	AM	PM	AM	PM		
A4120	383	677	642	1072	679	1137		
A470 (S) northbound	1167	1136	1220	1187	1333	1296		
Unnamed Road	0	0	0	0	0	0		
A470 (N) southbound	1068	1087	1563	1317	1666	1422		
Total	2618	2900	3426	3576	3677	3855		
% Increase from 2018			31%	23%	40%	33%		

Source: Mott MacDonald

**Table 13** to **Table 17** show that the greatest impact is expected on the Junction 2 (Triangle Business Park Road/Merthyr Road/Hoover Factory/Unnamed Road/Pentrebach Road), which is used by a large proportion of the development traffic. The flow increase is particularly significant in the AM peak, increasing by 111% by 2021 and 121% by 2031.

## 8 Walking, Cycling & Public Transport

#### 8.1 Overview

The masterplan framework and design principles (**Appendix A**) recognises the importance of sustainable transport. The design proposals include active streets, generous landscaping and key green links, which connect the site internally and improve access to existing transport services and infrastructure.

#### 8.2 Walking and Cycling

The masterplan proposes an extensive walking and cycling network within the development site, which integrates well with existing routes the Active Travel improvements proposed by Merthyr Tydfil County Borough Council.

The proposed Landscape Strategy and Urban Design Principles proposes:

- active streets and space that prioritise pedestrian and cycle movement through shared space;
- pedestrian and cycle-friendly environment that links to the surrounding areas and connects
  the site across the river, including wayfinding to the Taff and Trevithick Trails and new
  footbridges;
- making the Taff river corridor accessible and a pedestrian friendly environment; and
- an Active Travel Route within a green corridor in north-south direction that provides appropriate screening and buffer space to the railway line.

The above measures will provide a high quality active travel network, with good permeability throughout the site, providing opportunity for sustainable travel within the site and links to existing walking and cycling routes.

#### 8.3 Park and Ride

The development proposals include improving the setting of the existing Pentrebach Station, including an 85-space rail Park and Ride facility. Park and Ride provision will increase access to public transport for those who do not live within walking distance of the rail stations and has the potential to encourage mode shift. Those who currently travel for their entire journey by car (between Cardiff and Merthyr Tydfil) may make use of the Park and Ride facility.

Providing a Park and Ride will also have a negative effect on the local road network close to the station and proposed access to the car park, including the A4060, A4054 and Merthyr Road. The opportunity to park may also encourage rail users (who would otherwise have walked) to drive to the station.

#### 8.4 New Metro Station

The masterplan and development framework identify the potential for a new Metro Station and considers that the integration of the Metro could act as a catalyst for development. A possible location for the new station is proposed towards the north east of the site, immediately south of the bridge over the river Taff.

The Merthyr line, and both the Merthyr Tydfil and Pentrebach Stations are being considered for core enhancements as part of the South Wales Metro. A new Metro station at the proposed location would provide excellent access to the Metro network for the development site and would likely increase the proportion of residents and employees using rail.

The impact on travel behaviour due to the Metro and any potential new station could be significant. Not only could the Metro provide accessible and continent travel for residents and employees within the proposed development, depending on the frequency and capacity of the Metro it could also attract users from wider areas of Merthyr Tydfil.

To understand the likely and full impact of a new Metro station in this location further details would be required, and a specific variable demand modelling exercise undertaken to predict and quantify changes to the local transport network.

### 9 Summary and Conclusion

#### 9.1 Summary

An emerging development framework and masterplan has been produced for the redevelopment of the former Hoover site and surrounding land in Pentrebach, Merthyr Tydfil. This document has been prepared as a standalone review and high-level transport assessment of the masterplan proposals.

Located between the A470 and the A4060 and close to the A465, the site is well positioned in relation to the Strategic Highway Network, which provides direct access to major destinations in south east of Wales and beyond.

The masterplan framework recognises the importance of sustainable transport and includes active streets, generous landscaping and key green links, which will provide a high quality active travel network, with good permeability throughout the site.

Pentrebach Rail Station forms part of the masterplan and proposals include for a new Park & Ride car park. Located within the masterplan boundary and close to the to the proposed housing and employment sites, the station would provide a viable alternative to travel by private car. In addition, Merthyr Town Centre, Merthyr Rail Station and bus stops along the A4054 are located within acceptable walking and cycling distances of the development site.

The masterplan and development framework identify the potential for a new Metro Station and it is considered that the integration of the Metro could act as a catalyst for development. The Merthyr line (and both the Merthyr Tydfil and Pentrebach Stations) are being considered for core enhancements as part of the South Wales Metro.

The impact on travel behaviour due to the Metro and any potential new station could be significant. Not only could the Metro provide accessible and continent travel for residents and employees within the proposed masterplan development, depending on the frequency and capacity it could also attract users from a wider catchment. Due to proximity, price, reliability, and journey time, an increased number of commuters may choose to travel by rail.

Highway analysis and junction modelling does not form part of this assessment. However, to understand the potential impact of development traffic consideration has been given to key highway links and junctions.

Vehicle trips associated with the masterplan development have been forecast using the software TRiCS and land-use assumptions from the masterplan. Traffic has been distributed across the local highway network using census information and existing travel patterns. Due to the mixed-use nature it is very likely that some residents may live and work within the masterplan site, or trips between work, leisure, retail and home maybe linked. To reflect this and to account for modal shift from car to public transport, due to the good accessibility to bus and rail infrastructure, a percentage reduction has been applied to the trip generation estimates.

This assessment has demonstrated that that the A4054 (High Street, Plymouth Street, Merthyr Road) would be used by a large proportion of the development traffic and is likely to be significantly impacted. With development traffic the road is forecast to be at capacity by 2021 and over capacity by 2031. In addition, both the A4210, A4060 and Merthyr Road, are shown to be reaching 70%, 60% and 69% capacity respectively by 2031.

The increase in traffic, as a result of the development, is likely to have a material impact on all five junctions considered in this assessment. Each junction will be subject to at least a 10% increase in total vehicles by 2021 and 20% by 2031. Due to the single point of access (via the existing bridge) to the development site west of the river, and the main access road to the proposed residential area, the five-arm roundabout (Pentrebach Road/Merthyr Road/Triangle Business Park Road/Bridge to Abercanaid/Hoover Access) will be subject to a significant increase in traffic. If the site is fully developed and occupied, the number of vehicles using the roundabout will double by 2021 and 2031.

#### 9.2 Conclusion and Recommendations

The site is well positioned in terms of access to the highway network, with good road links to local and major destinations across south east Wales.

The development proposals provide sustainable travel opportunity, with improved links to existing and proposed walking and cycling routes. The location of the development provides quick and convenient access to existing public transport infrastructure, which serves the Merthyr to Cardiff corridor.

A Travel Plan should be agreed at an early stage and developed in parallel with the masterplan and design process, to maximise accessibility by all modes of travel.

Further information and variable demand modelling is required to understand the full impact of the proposed Metro Station and Park & Ride at Pentrebach Station, which could have a significant impact on the development travel patterns and mode of travel.

Key junctions and highway links have been identified for further analysis. Additional studies or specific junction modelling should be undertaken to identify appropriate mitigating measures or improvement works.

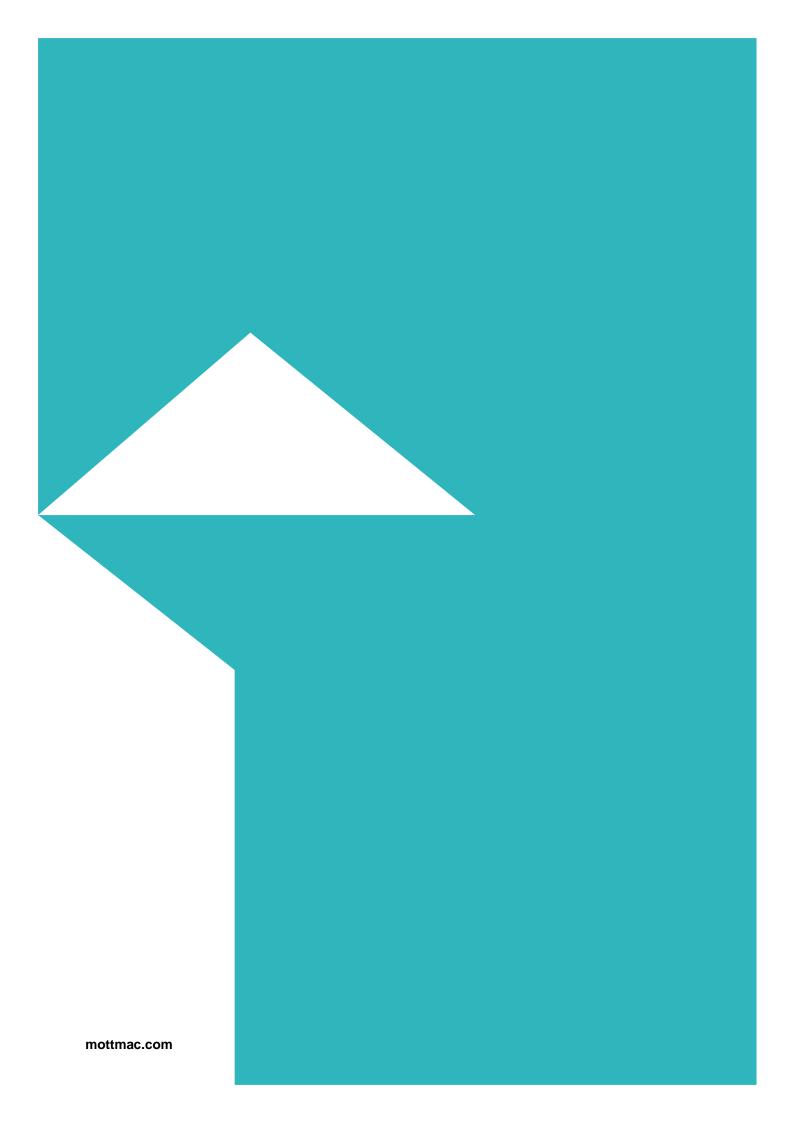
# **Appendices**

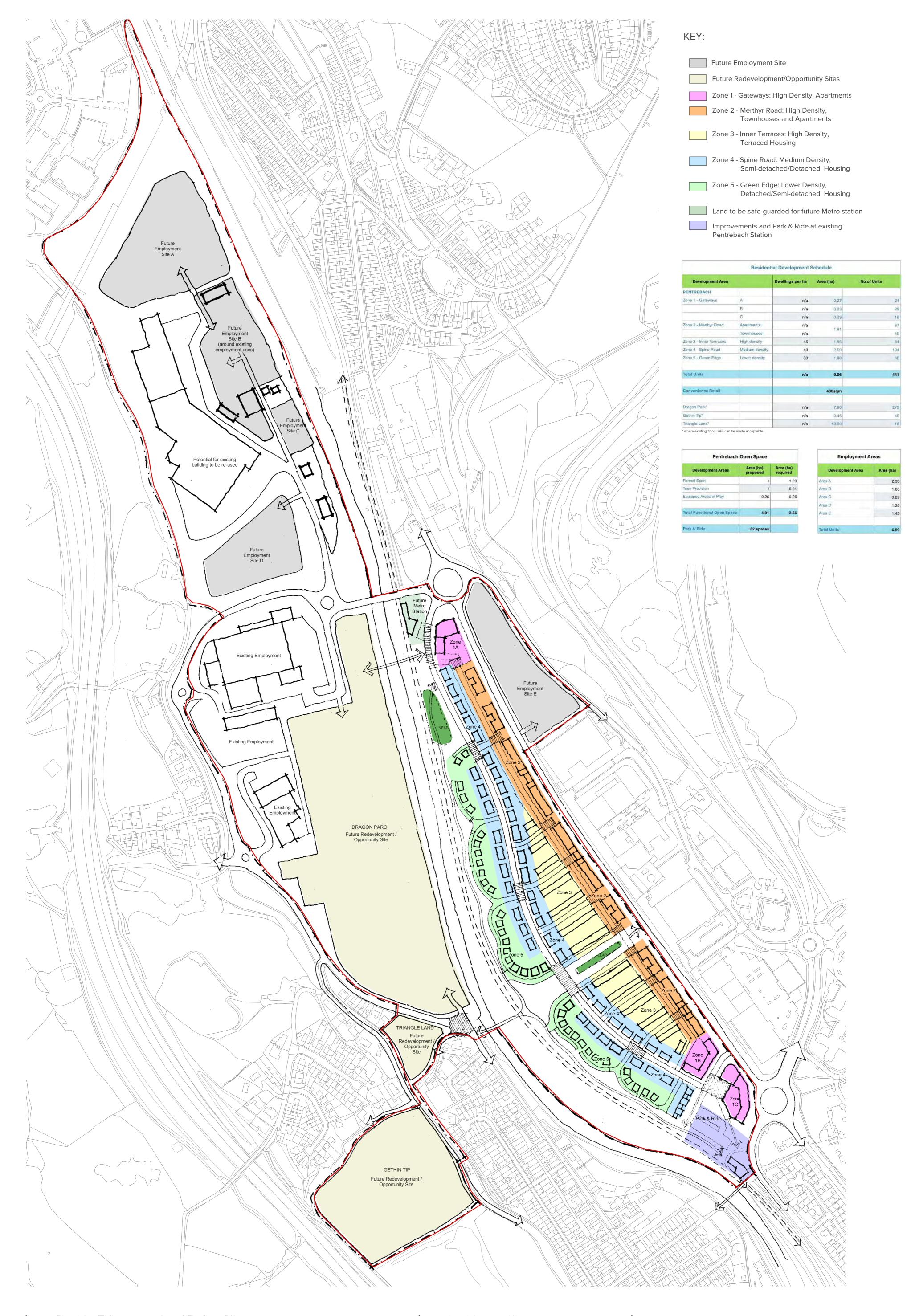
A.	Hoover Site Development Masterplan	30
B.	Network Diagrams	31

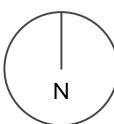
# A. Hoover Site Development Masterplan

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### **B. Network Diagrams**







Drawing Title: Land Budget Plan

Drawing Number: UG1725 - URB - UD - SK - 010

Project: Pentrebach

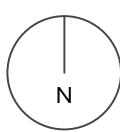
Revision: B

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Date: 29.05.18







Drawing Title:
Drawing Number:
Project:

Development Framework

UG1725 - URB - UD - GA - 001

UG1725 - URB - UD - GA -Pentrebach Revision: B

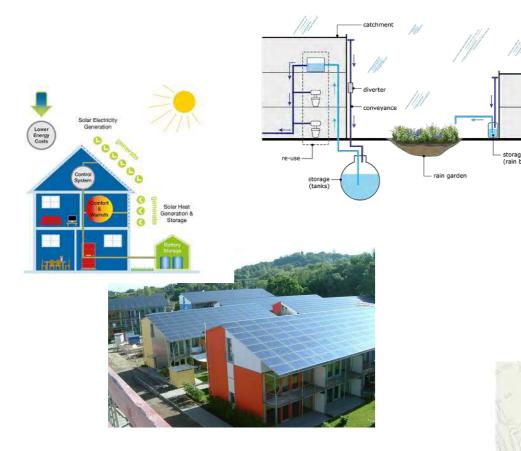
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Date: 31.05.18

Planning & design

# Sustainable Living

Create a distinctive and unique environment that can act as a flagship development in the area in terms of sustainability:

- PV/Solar thermal systems, rainwater harvesting and optimised refuse/recycling
- Passivhaus standards and adaptability for future needs
- Re-use of existing employment buildings
- Potential for district heating (subject to future uses): Combined Heat and Power (CHP), Combined Cooling, Heat and Power (CCHP), connection to nearby systems



### The River as a feature

Make the Taff corridor an accessible feature of the area:

- · Open up the riverside and create an accessible and pedestri-
- an-friendly movement corridor along it · Positively adress the river with development
- Bring the River setting 'into' the site through incorporating water features/SUDS/watercourses in the public realm



### **Distinctive Streetscape**

Create a legible and attractive streetscape:

- Distinctive character areas through street hierarchy, built form, landscaping and boundary treatments
- Include a variety of built form and housetypes to create an interesting roofline
- · Potential for a mixture of traditional and contemporary architectural styles



### **Creating Connections**

Pedestrian and cycle-friendly environment that links to the

- Footbridges to establish links across the river
- Improved connections and wayfinding to the Taff and Trevithick



surrounding areas and connects the site across the river:

- Improve setting of roundabouts to the West



## **Active Streets and Spaces**

Create streets and spaces that are usable and enjoyable for residents and visitors alike:

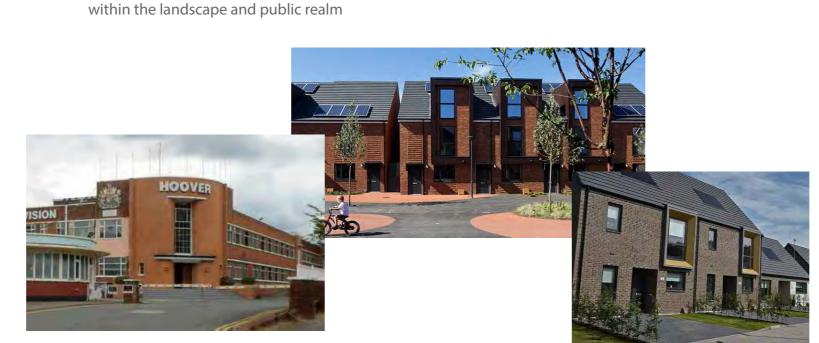
- · Centre of activity around a local community hub and small retail use - potential for a focal civic square with street furniture
- Prioritise pedestrian and cycle movement through shared spaces and play streets with integral landscaping
- Maximise natural surveillance over public spaces and streets



## Reflecting the Site's Heritage

Draw on the rich history of the site and reflect it in the development: • Potential to reflect the Hoover Factory frontage and signage in the built form (e.g. a gateway feature at the Park and Ride, in the

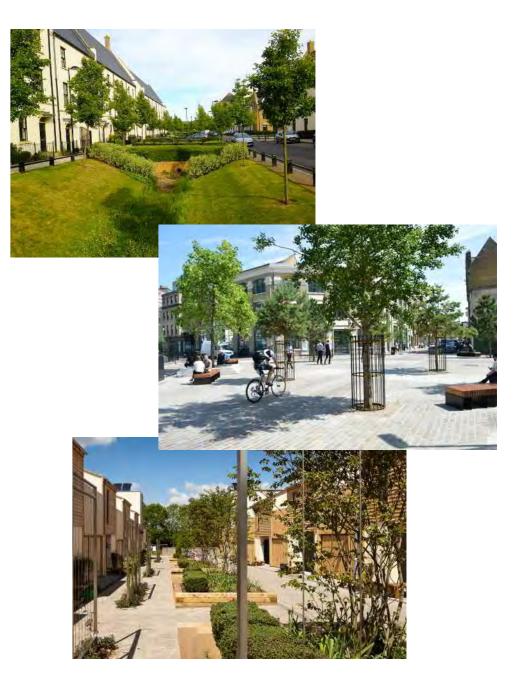
- architectural style of the apartments) • Potential to draw on historic terraced building form and create a
- contemporary adaptation
- Potential to include historic artefacts and reflect cultural heritage



## **Generous Landscaping**

Develop a landscape-led approach that contributes to the sense of place in the development:

- The river corridor as strong green spine that filters into the development
- Retain and integrate existing green infrastructure
- Distinctive formal and informal planting to support character
- Provide natural areas of play and recreation



# **Transport-oriented Development**

Integrate the Metro as catalyst for development:

- Improve the setting of the existing Pentrebach Station and include a Park & Ride
- Potential to include a second Metro station to the North
- Provide a well-overlooked Active Travel Route within a green corridor in north-sourth direction that provides appropriate screening and buffer space towards the railway line
- · Potential for higher densities and reduced parking due to access to sustainable transport





Drawing Title: Drawing Number: Project:

**Urban Design Principles** UG1725 - UD - SK - 90 - 011 Pentrebach

Revision: A n/a @ A1 Scale:

31.05.18

Date:

\*\*urbanists



CA1: Business / Commercial units to be intergrated with bold areas of native woodland & meadow planting.



Tree lined boulevard with generous verges to provide a spine through the development.



Key green spaces to provide informal recreation & play.





CA3: Reinforce riverside character with swales & SUDs compliant green attenuation features in hard urban areas.





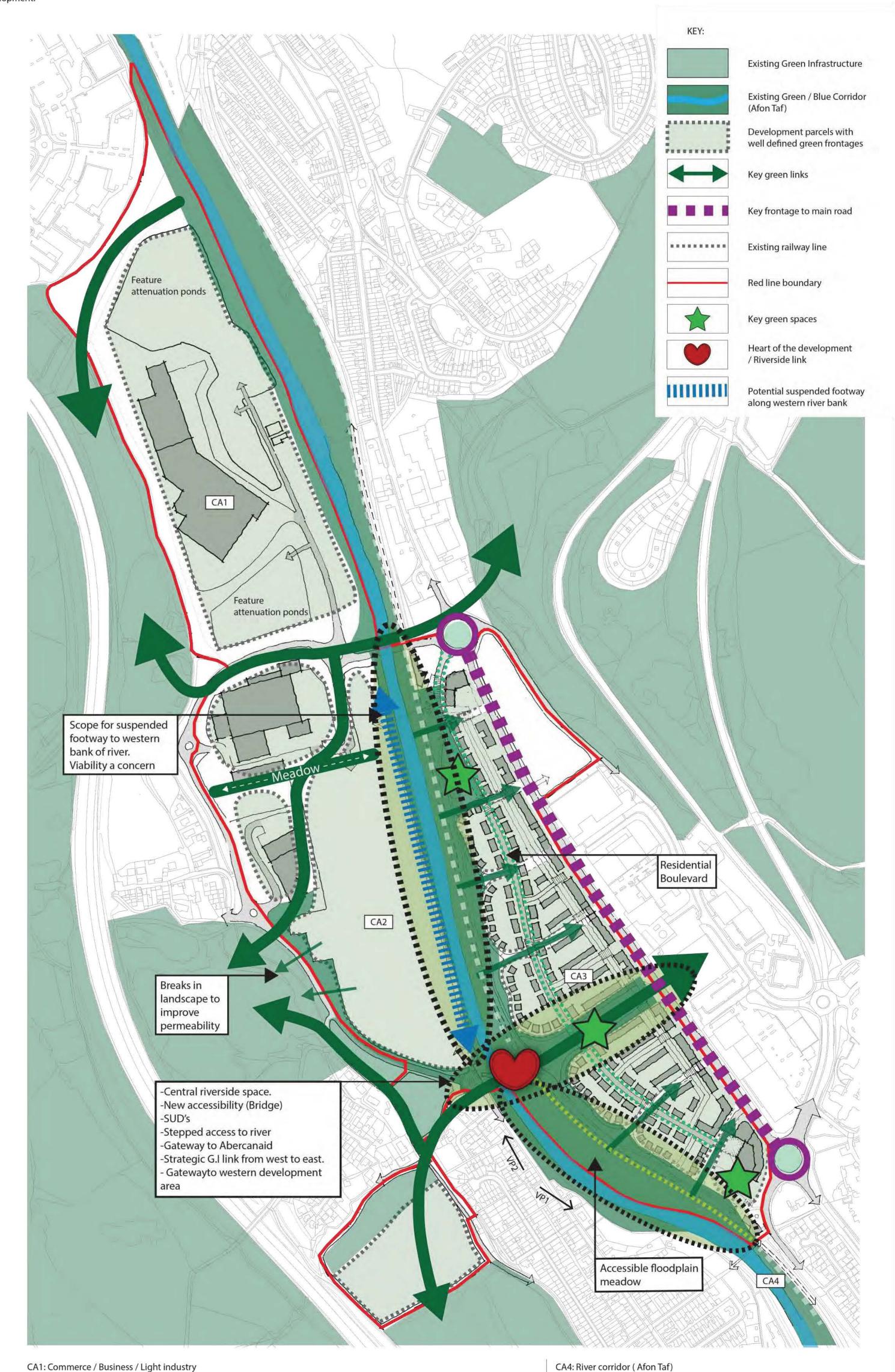
Active Travel Route integrated in the green corridor along the river with buffer planting to railway line



VP1: View South across site



VP2: View North across site





Drawing Title:

- Pentrebach Landscape Strategy

- UG1725 - UD- SK - 90 - 12 Drawing Number:

Project: - Pentrebach

CA2: Future Redevelopment/Opportunity Site Strong riverside frontage is a key opportunity.

CA3: Residential development (East)

- N/A Scale: Date: - 24.05.18

Revision:

Integrate large scale infrastructure & buildings into landscape with broad areas of native woodland & wildflower meadows.

Use attenuation features on key approaches to add interest & reinforce riverside setting.

Provide strong connections to riverside with East / West alligned open spaces / urban fabric.

Strengthen riverside character with swales & SUDS compliant planting areas.



Retain & manage existing vegetation & habitat. Reinforce with new planting where appropriate.

Enhance access for residential / visitors in key areas.

