

Twynnyrodyn,
Merthyr Tydfil



Transport Assessment

Persimmon Homes East Wales

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2021

Lime Transport Ltd
5A Andrews Buildings
Stanwell Rd
Penarth, CF64 2AA

t: 02920 700924
e: mail@limetransport.com

www.limetransport.com

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1.2 Planning history

- 1.2.1 A pre-application submission for the site was submitted to the Local Planning and Highway Authority in April (2020), which included a Draft Transport Assessment. The Local Highway Authority appointed Redstart to review the Draft TA, who produced an Audit Report of the Draft Transport Assessment (see **Appendix A**).
- 1.2.2 The Transport Assessment Audit, produced by Redstart in August 2020, stated that the *‘Transport Assessment submitted cannot be accepted as the traffic and transport implications of the development cannot be fully assessed’*. The main points raised within the Transport Assessment Audit included that:
- There are no significant improvements for pedestrians and cyclists, and as part of the proposed development, significant contributions towards active travel should be made;
 - Improvements to walking and cycling outside of the red-line boundary are required. The feasibility of having safe, secure and direct linkage to public transport needs to be shown;
 - Trip generation should be based on observed turning proportions at the Penheolferthyr/Elm Tree Grove Roundabout;
 - Traffic growth factors are incorrect, and should be based on Temprow/NTM factors for urban minor roads; and,
 - The traffic surveys undertaken should be submitted and confirmation of existing queue lengths is required to provide confidence in the modelling undertaken.
- 1.2.3 This Transport Assessment has been updated to respond to the comments raised by Redstart in August 2020. A copy of the Transport Assessment Audit is included at the end of this report in Appendix A.

1.3 Scope of Transport Assessment

- 1.3.1 The scope of this Transport Assessment has been based on the guidance within the Department for Transport’s ‘Transport Evidence Bases in Plan Making and Decision Taking. 2015’, together with an initial discussion with the local highway authority. Following this introductory section the scope of the report includes:
- Details of public transport, walk and cycle accessibility;
 - Estimates of the likely person trip generation (by mode) for the proposed development, based on a review of the TRICS 7.8.3 trip generation database;
 - A review of the most recent five years’ personal injury collision data within the area immediately surrounding the site;
 - An estimate of the impact of the proposed development for the anticipated years of opening in 5 and 10 years, based on Temprow/NTM growth factors;
 - As assessment of the impact of the proposed development at the following junctions:

- Junction 1: Twynyrodyn Road/Court Street/Tramroadside N/Tesco Extra roundabout;
 - Junction 2: Gilfach Cynon/Wallhead Road/Penheolferthyr/ Twynyrodyn Community School roundabout;
 - Junction 3: Penheolferthyr/ Elm Tree Grove roundabout;
 - Junction 4: Penheolferthyr/ Goat Mill Road/ A4102 priority junction;
 - Junction 5: Goat Mill Road/A4102/ A4060/ Bogey Road junction
 - Junction 6: Lower High Street/High Street/A4102/ A4054 Avenue De Clichy roundabout; and,
 - Junction 7: Bro Dawel/ Plymouth Street priority junction.
- Identify any mitigation measures where necessary, including a summary of the Travel Plan and Transport Implementation Strategy.

1.4 Structure of the report

1.4.1 The purpose of this Transport Assessment is to detail the likely transport characteristics of the proposed development (of up to 131 dwellings) to identify the likely impact on the surrounding transport network, and to detail any mitigation measures should these be required. Throughout the report a rebuttal to the Transport Assessment Audit produced by Redstart is also included.

1.4.2 Following this introductory section, the report is structured as follows:

- Section 2 sets out the policy context for the development;
- Section 3 identifies the accessibility of the site and reviews personal injury collision data within the study area;
- Section 4 describes the development proposals, including the access to the site;
- Section 5 predicts the likely travel characteristics of the development;
- Section 6 assesses the impact of the proposed development on the surrounding highway network and highlights mitigation measures where required, including the development of a site wide travel plan;
- Section 7 outlines the Transportation Implementation Strategy; and,
- Section 8 summarises the findings of the report.

2 Policy context

2.1 Introduction

2.1.1 This section of the report reviews the relevant national, regional and local planning policies relating to transport, and includes:

- The Wales Spatial Plan – People, Places and Future;
- Planning Policy Wales (PPW 11);
- One Wales; Connecting the Nation;
- Technical Advice Note (TAN) 18- Transport; and,
- Merthyr Tydfil County Borough Council Replacement Local Development Plan (2016-2031) Adopted 29th January 2020.

2.2 Wales Spatial Plan – People, Places, Futures

2.2.1 The Wales Spatial Plan – People, Places, Futures (WSP) was originally adopted by the National Assembly for Wales in November 2004, and updated in 2008 to bring the WSP into line with One Wales [see below] and to give status to the area work which has developed over the previous two years.

2.2.2 In Wales, spatial planning is the consideration of what can and should happen where. It is a principle of the WSP that development should be sustainable. Sustainable development is about improving wellbeing and quality of life by integrating social, economic and environmental objectives in the context of more efficient use of natural resources.

2.2.3 The purpose of the WSP is to ensure that what is done in the public, private and third sectors in Wales is integrated and sustainable, and that actions within an area support each other and jointly move towards a shared vision for Wales and for the different parts of Wales.

Achieving sustainable development

2.2.4 The WSP states that:

‘Citizens must be able to access job opportunities and public services – health, social services, education, etc – if equality of opportunity is to be successfully promoted in Wales. This is a particular concern for those who face barriers to accessibility, such as people on low incomes, young and old people, disabled people and those living in rural areas.’

2.2.5 The WSP also states that:

‘In the context of responding to and mitigating the effects of climate change, the Wales Spatial Plan supports the development of spatially targeted responses. These include reducing the need to travel by co-locating jobs, housing and services, for instance, and

changing behaviour in favour of ‘greener’ modes of travel, such as car sharing, public transport, walking and cycling.’

2.3 Planning Policy Wales – Edition 11 (February 2021)

- 2.3.1 Planning Policy Wales (PPW) sets out the land use planning policies of the Welsh Assembly Government. It is supplemented by a series of Technical Advice Notes (TANs). Procedural advice is given in circulars and policy clarification letters.

Movement

- 2.3.2 At paragraph 3.12 PPW states that *‘Good design is about avoiding the creation of car-based developments. It contributes to minimising the need to travel and reliance on the car, whilst maximising opportunities for people to make sustainable and healthy travel choices for their daily journeys. Achieving these objectives requires the selection of sites which can be made easily accessible by sustainable modes as well as incorporating appropriate, safe and sustainable links (including active travel networks) within and between developments using legal agreements where appropriate.’*

- 2.3.3 At paragraph 3.48 PPW states that *‘spatial strategies should support the objectives of minimising the need to travel, reducing reliance on the private car and increasing walking, cycling and use of public transport.’*

- 2.3.4 At paragraph 4.1.1 PPW states that *‘the planning system should enable people to access jobs and services through shorter, more efficient and sustainable journeys, by walking, cycling and public transport. By influencing the location, scale, density, mix of uses and design of new development, the planning system can improve choice in transport and secure accessibility in a way which supports sustainable development, increases physical activity, improves health and helps to tackle the causes of climate change and airborne pollution.’*

- 2.3.5 At paragraph 4.1.4 PPW states that *‘Land use and transport planning must be integrated. The planning system must ensure it enables integration:*

- *within and between different types of transport;*
- *between transport measures and land use planning;*
- *between transport measures and policies to protect and improve the environment;*
- and,*
- *between transport measures and policies for education, health, social inclusion and wealth creation.’*

Sustainable transport

- 2.3.6 At paragraph 4.1.9 PPW states that *‘The Welsh Government is committed to reducing reliance on the private car and supporting a modal shift to walking, cycling and public transport. Delivering this objective will make an important contribution to decarbonisation, improving air quality, increasing physical activity, improving the health of the nation and realising the goals of the well-being of Future Generations Act.’*

- 2.3.7 At paragraph 4.1.12 PPW states that *'it is Welsh Government policy to require the use of a sustainable transport hierarchy in relation to new development, which prioritises walking, cycling and public transport ahead of the private motor vehicles. The transport hierarchy recognises that Ultra Low Emission Vehicles also have an important role to play in the decarbonisation of transport, particularly in rural areas with limited public transport services.'*
- 2.3.8 Finally, at paragraph 4.1.13 PPW states that *'The sustainable transport hierarchy [see Figure 2.1 below] should be used to reduce the need to travel, prevent car-dependent developments in unsustainable locations, and support the delivery of schemes located, designed and supported by infrastructure which prioritises access and movement by active and sustainable transport.'*



Figure 2.1 *The sustainable transport hierarchy for planning*

Parking

- 2.3.9 As stated in PPW (Edition 11) *'Car parking provision is a major influence on how people choose to travel and the pattern of development. Where and how cars are parked can in turn be a major factor in the quality of a place'.*
- 2.3.10 It is important to recognise that *'a design-led approach to the provision of car parking should be taken, which ensures an appropriate level of car parking is integrated in a way which does not dominate the development'.*
- 2.3.11 PPW highlights that parking provision should take into consideration the site location and access to local facilities, *'Parking provision should be informed by the local context, including public transport accessibility, urban design principles and the objective of reducing reliance on the private car and supporting a modal shift to walking, cycling and public transport'.* PPW11 encourages that *'Planning authorities must support schemes which keep parking levels down, especially off-street parking, when well designed'.*

- 2.3.12 Local authorities will need to ensure that their parking standards reflect local transport provision 'Parking standards should be applied flexibly and allow for the provision of lower levels of parking and the creation of high quality places'.

2.4 One Wales: Connecting the Nation

- 2.4.1 National transport policy for Wales is specified within the Wales Transport Strategy, One Wales: Connecting the Nation, which is supplemented by a series of Technical Advice Notes (TANs).

- 2.4.2 The goal of One Wales: Connecting the Nation is to:

'Promote sustainable transport networks that safeguard the environment while strengthening our country's economic and social life. The transport strategy identifies a series of high-level outcomes and sets out the steps to their delivery. The One Wales programme is working to achieve a nation with access for all, where travelling between communities and accessing services, jobs and facilities in different parts of Wales is both easy and sustainable, and which support the growth of our economy.'

- 2.4.3 The policy aims to promote active travel (walking and cycling) for short journeys to promote healthy lifestyle. In addition to active travel, the use of public transport is also promoted.

2.5 Technical Advice Note (TAN18)

- 2.5.1 TAN 18 identifies that Planning Policy Wales and the Wales Transport Strategy both aim to secure the provision of transport infrastructure and services, which improve accessibility, build a stronger economy, improve road safety and foster more sustainable communities.

- 2.5.2 To achieve this and the core objectives, the following initiatives relevant to the proposed development are:

- Reducing the need to travel;
- Promoting walking and cycling;
- Managing parking provision; and,
- Encouraging the location of development near other related uses to encourage multi-purpose trips.

2.6 Wales Active Travel Act (2013)

- 2.6.1 The Active Travel Bill (2013), encourages Local Authorities to promote active travel such as walking and cycling, and to improve active travel routes in regard to the needs of walkers and cyclists. The act also encourages Local Authorities to improve the highway to enhance the provision for cyclists and pedestrians.

- 2.6.2 The active travel act makes provision for:

- *Approved maps of existing active travel routes and related facilities in the local authority's area;*
- *Approved integrated network maps of the new and improved active travel routes and related facilities needed to create integrated networks of active travel routes and related facilities in a local authority's area;*
- *Requiring local authorities to have regard to integrated network maps in preparing transport policies and to ensure that there are new and improved active travel routes and related facilities;*
- *Requiring the Welsh Ministers to report on active travel in Wales;*
- *Requiring the Welsh Ministers and local authorities, in the performance of functions under the Highways Act 1980, to take reasonable steps to enhance the provision made for walkers and cyclists and to have regard to the needs of walkers and cyclists in the exercise of certain other functions; and,*
- *Requiring the Welsh Ministers and local authorities to exercise their functions under the Act so as to promote active travel journeys and secure new and improved active travel routes and related facilities.*

2.7 Merthyr Tydfil County Borough Council Replacement Local Development Plan (2016-2031) Adopted 29th January 2020

2.7.1 The Replacement Local Development Plan (LDP) provides a framework for the sustainable development of the Merthyr Tydfil County Borough area up to 2031.

Policy SW3: Sustainably Distributing New Homes

2.7.2 The proposed development site is allocated for residential development and located within a 'Primary Growth Area'. Policy SW3 highlights site 18 'Twynyrodyn' as a site allocated to provide a total of 120 residential dwellings. The indicative delivery timescale for providing the housing is between 2021-2024.

Policy SW4: Settlement Boundaries

2.7.3 Merthyr Tydfil is identified as a primary growth area which has been implemented to encourage development within urban areas. Merthyr Tydfil has been identified as an area where approximately 70% of the future growth within the County Borough will be developed. This has been identified within the LDP spatial strategy with an aim to locate the majority of future development close to where existing services and facilities are located and in areas which are already serviced by good public transport. It is also considered that this focus will also enable the regeneration of previously developed land whilst providing new housing in an area of high housing need.

Primary growth area

2.7.4 As stated in the LDP 'directing the majority of development to the 'Primary Growth Area' is consistent with the Wales Spatial Plan and 'Turning Heads- A Strategy for the Heads of the Valleys 2020'.

2.7.5 Merthyr Tydfil is strategically located at the centre of the Heads of the Valleys geographic and economic region in the north of the 'Cardiff Capital Region' and provides a strategic link between the north-south A470 and east-west A465 roads. This is reflected by good public transport infrastructure including a rail terminus and bus interchange.

2.7.6 The LDP, therefore, includes appropriate policies and land allocations to facilitate the expansion of the main settlement of Merthyr Tydfil as a sustainable place to live, work and visit.

Policy SW12 Improving the Transport Network

2.7.7 Policy SW12 states that development that encourages a modal shift towards sustainable transport will be supported, including the enhancement of pedestrian, cycle, rail and bus facilities, in addition to any necessary road improvements. Development proposals will be expected to demonstrate how they reduce the need to travel and encourage the use of sustainable transport.

2.7.8 To support the County Borough's transport network the following schemes are proposed:

1. *Proposed Active Travel Integrated Network Map routes*
2. *New Merthyr Tydfil Central Bus Station;*
3. *South East Wales Metro (Merthyr Tydfil Valley line) improvements;*
4. *Safeguarding of land for a new metro station at the Hoover Strategic Regeneration Area (HSRA);*
5. *Pentrebach Rail Station Park and Ride;*
6. *Safeguarding of the Cwm Bargoed rail line and rail head;*
7. *Safeguarding of land for future rail line extension (Cwm Bargoed to Dowlais Top); and,*
8. *Safeguarding land for the duelling of the A465 (T) Heads of the Valleys Road.'*

2.7.9 The plan recognises the Transport Hierarchy and national policy aims to reduce the need to travel, particularly by private motor vehicles, by supporting healthy and sustainable transport options and encouraging a modal shift.

2.7.10 At the top of the transport hierarchy are efforts to promote walking and cycling. As stated in Policy SW12, proposed Active Travel Routes have been identified for phased improvements as illustrated on the County Borough's Active Travel Integrated Network Map (INM). This includes re-connecting Merthyr Tydfil and Aberdare through the disused Merthyr to Abernant railway tunnel, together with improving important existing walking and cycling routes, such as the National Cycle Network and The Heads of the Valley Route, which will bring significant socio-economic benefits.

2.8 Summary

2.8.1 It is considered that the proposed development at Twynyrodyn is in accordance with the relevant national, regional and local planning policies, as it:

- Is an allocated site, within the urban area of Merthyr Tydfil (which is identified as a primary growth area);

- Is located within easy walking and cycling distance of the majority of local facilities and amenities, as well as employment;
- Is accessible by walking, cycling and public transport (bus and rail).

3 Existing situation and accessibility

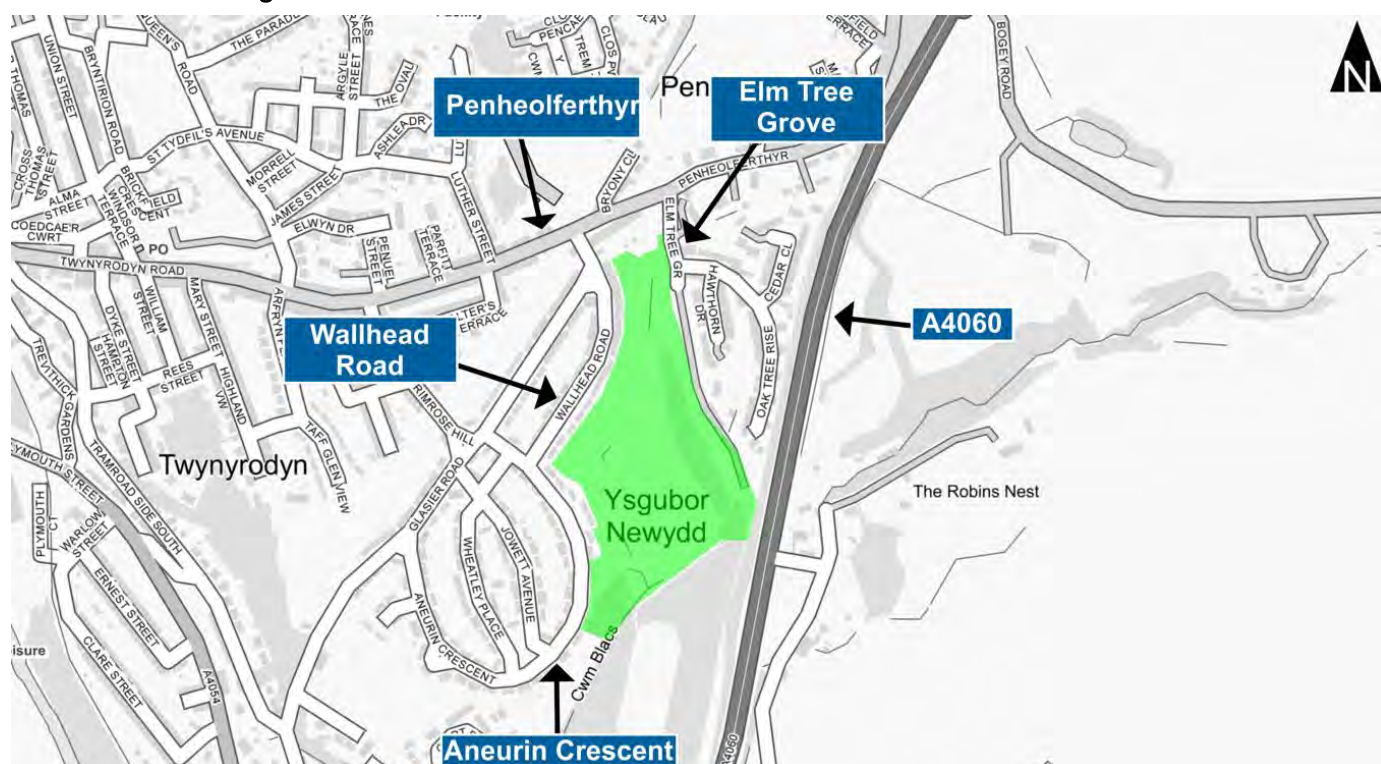
3.1 Site location

3.1.1 This section of the Transport Assessment summarises the existing transport network within the vicinity of the site, detailing the accessibility by walking, cycling, public transport and local highway network.

3.1.2 The proposed development is located off Penheolferthyr, approximately 2km to the south-east of Merthyr Tydfil, a well-established town centre. The proposed development is bounded by:

- Penheolferthyr to the north;
- Wallhead Road to the west;
- Elm Tree Grove and the A4060 to the east; and,
- Open space to the south

3.1.3 The location of the development site together with the local highway network is shown in **Figure 3.1** below.



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Figure 3.1 Local highway network

3.2 Travel characteristics

3.2.1 Travel characteristics of the existing population, including travel to work and car ownership statistics, has been obtained from the 2011 Census.

Travel to work

3.2.2 **Table 3.1** below sets out the travel to work mode split for the immediate area surrounding the site (Output Area), the Lower Super Output Area (LSOA) in which the site is located, the Middle Super Output Area (MSOA) and Merthyr Tydfil County Borough Council. This data excludes those that work from home and those that are not in employment.

Table 3.1 Mode split for journey to work based on 2011 Census data

	Mode split (%)		
	055C (LSAO)	003 (MSOA)	Merthyr Tydfil
Car driver	67	70	67
Car passenger	11	10	11
Bus	4	5	7
Train	1	2	2
Motorcycle	0	0	0
Cycle	0	1	0
Walk	15	11	10
Other	1	1	1

3.2.3 It can be seen from the table above that 67% of existing residents that live within the lower super output area in which the site is located travel to work by car (as driver), with a further 11% travelling as a passenger. It can also be seen that 15% of residents walk to work and 5% travel by public transport.

Car ownership

3.2.4 The average car ownership rate for Merthyr Tydfil is 1.05 vehicles per household. Within the Lower Super Output Area (LSOA), in which the site is located, the car ownership rate is lower, at 1.03 vehicles per household.

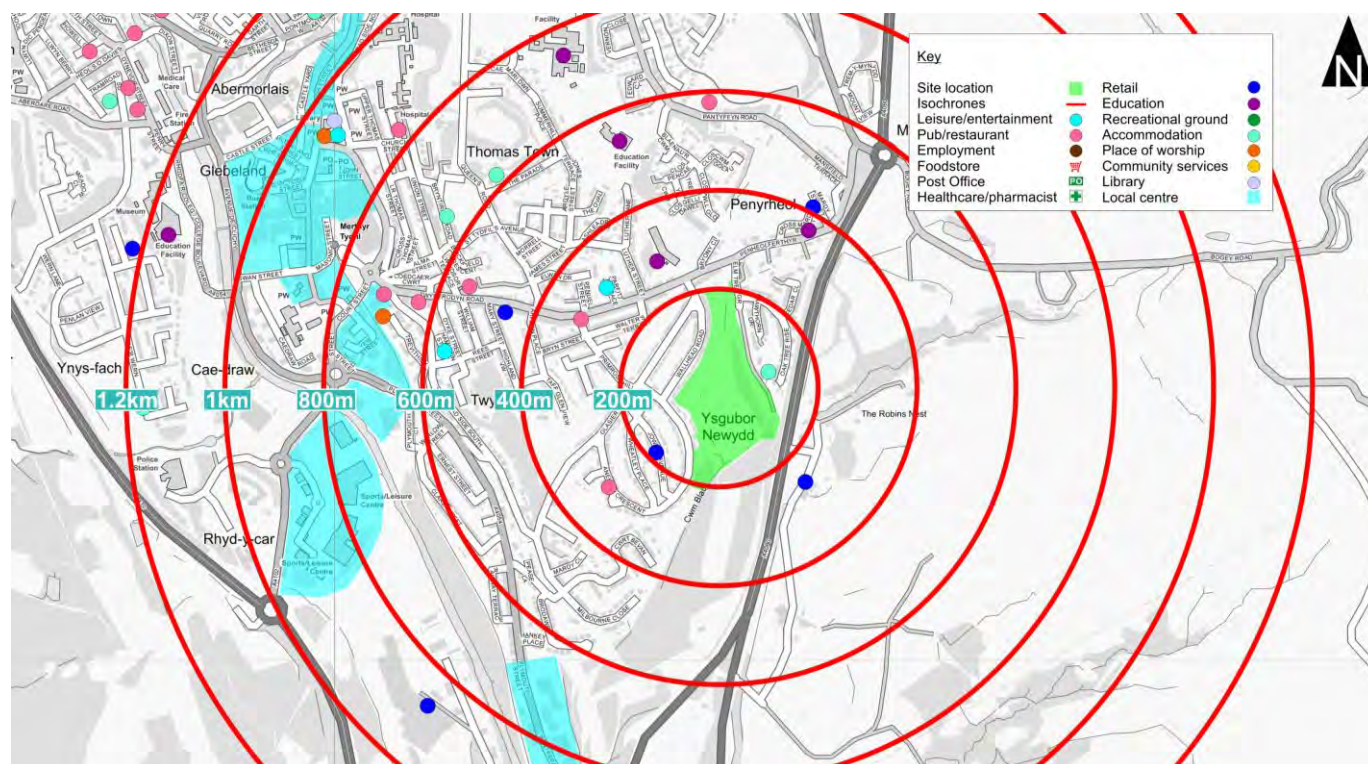
3.2.5 Looking at the LSOA in more detail, car ownership for the private and affordable housing located within the LSOA is set out below.

- 1.03 cars/vans per household for all dwelling types/sizes:
- 1.09 cars/vans per household for private dwellings; and,
- 0.58 cars/vans per household for affordable dwellings.

3.3 Connectivity

- 3.3.1 This site is accessible by walking, cycling and public transport, as described in the following paragraphs.
- 3.3.2 The Chartered Institution of Highways and Transportation (CIHT) guidelines '*Providing for Journeys on Foot*' indicates that the desirable walking distance for commuting and school journeys is 500m, the acceptable walking distance is 1km and 2km is the preferred maximum. The CIHT guidelines indicate that the desirable walking distance for 'Elsewhere', including local amenities, is 400m, the acceptable walking distance is 800m and 1.2km is the preferred maximum.
- 3.3.3 There are a number of key facilities within 1.2km of the site, including the following:
- Nursery School: 300m to the north-east;
 - Twynyrodyn Community School; 300 m to the north-west;
 - Ysgol Gymraeg Santes Tudful Secondary School: 800m to the north;
 - Cyfarthfa High Schooll: 1.2km to the north;
 - Post office: 1.2km to the west;
 - Supermarket: 1.2km to the north-west;
 - Restaurant/pub/takeaway: 1km to the north-west; and,
 - Place of worship: 1.2km to the north-west.
- 3.3.4 Merthyr Tydfil, a well-established town centre, is within 1.2km of the site, providing a range of retail, financial, employment and educational facilities. Furthermore, approximately 1km east of the site there is also a retail park providing retail and employment opportunities, together with restaurants and a leisure centre.

3.3.5 All amenities within 1.2km of the site are shown in **Figure 3.2** below.



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Figure 3.2 Location of facilities and amenities within 1.2km of the site

Walking

3.3.6 There are a number of pedestrian facilities in the immediate vicinity of the site. These facilities are as follows:

- Footway provision on either side of Penheolferthyr Road/ Gilfach-Cynon/Court Terrace,
- Formalised crossings along Penheolferthyr Road between the northern and southern sides of the carriageway;
- Dropped kerbs and tactile paving between the side streets;
- Footway provision on either side of Wallhead Road;
- Footway provision on either side of Aneurin Crescent; and,
- Footway provision on either side of Elm Tree Grove/Oak Tree Rise.

3.3.7 The existing pedestrian connections within immediate vicinity of the site are shown in **Figure 3.3** below.

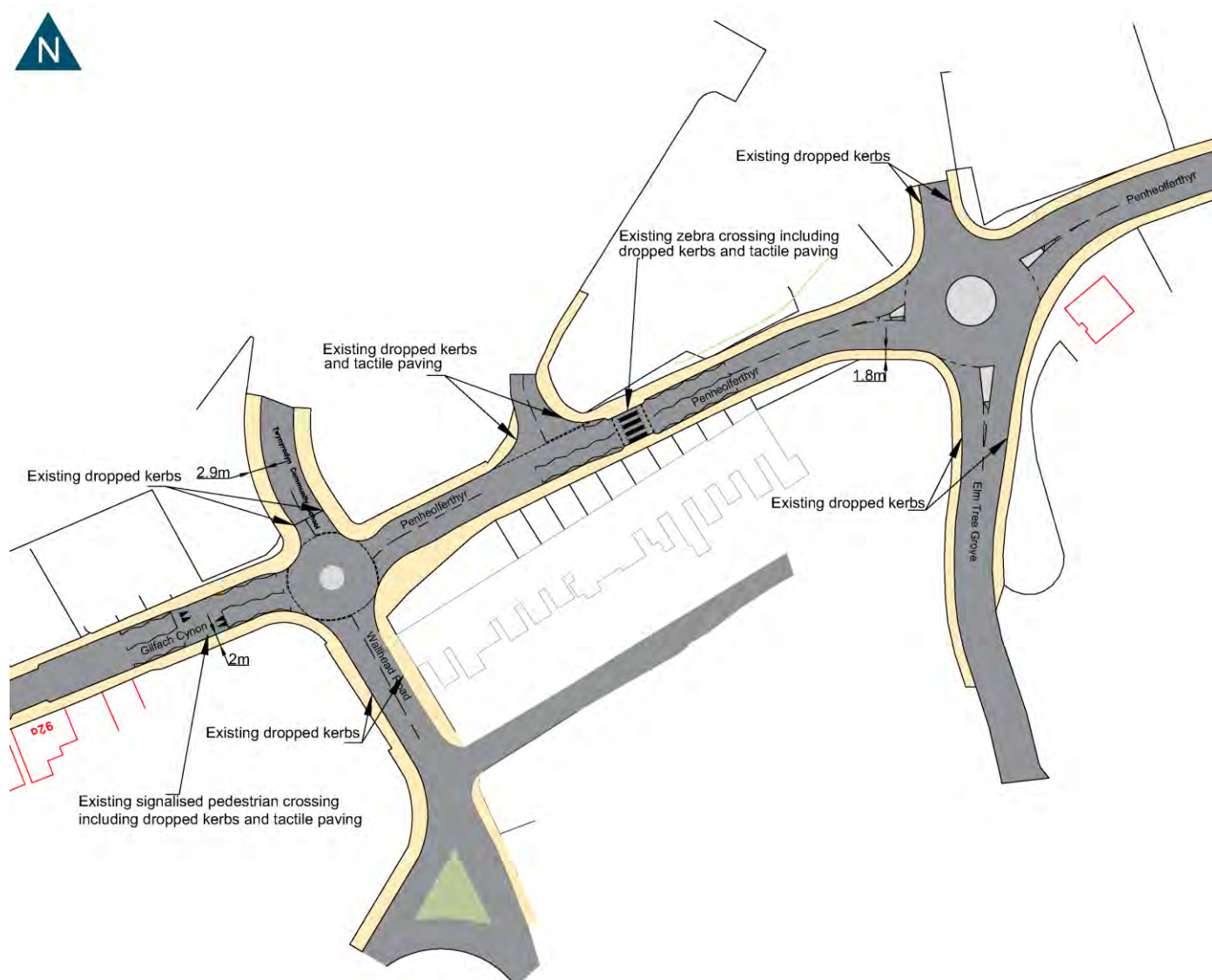
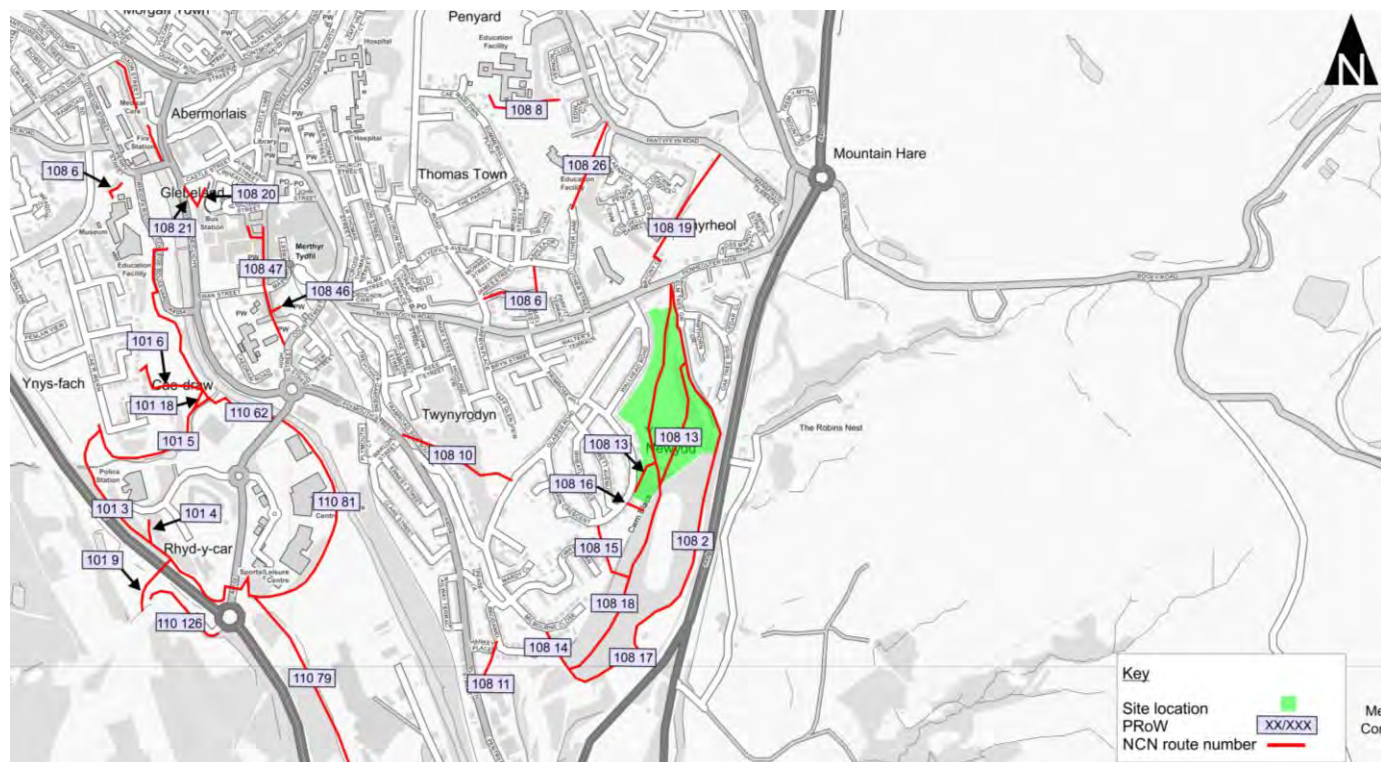


Figure 3.3 Pedestrian connections within immediate vicinity of the site

- 3.3.8 In addition to the existing footways, there are also various PRoWs in the vicinity of the site. There are two existing ProWs running through the site and one along the eastern boundary, as shown in **Figure 3.4** below.



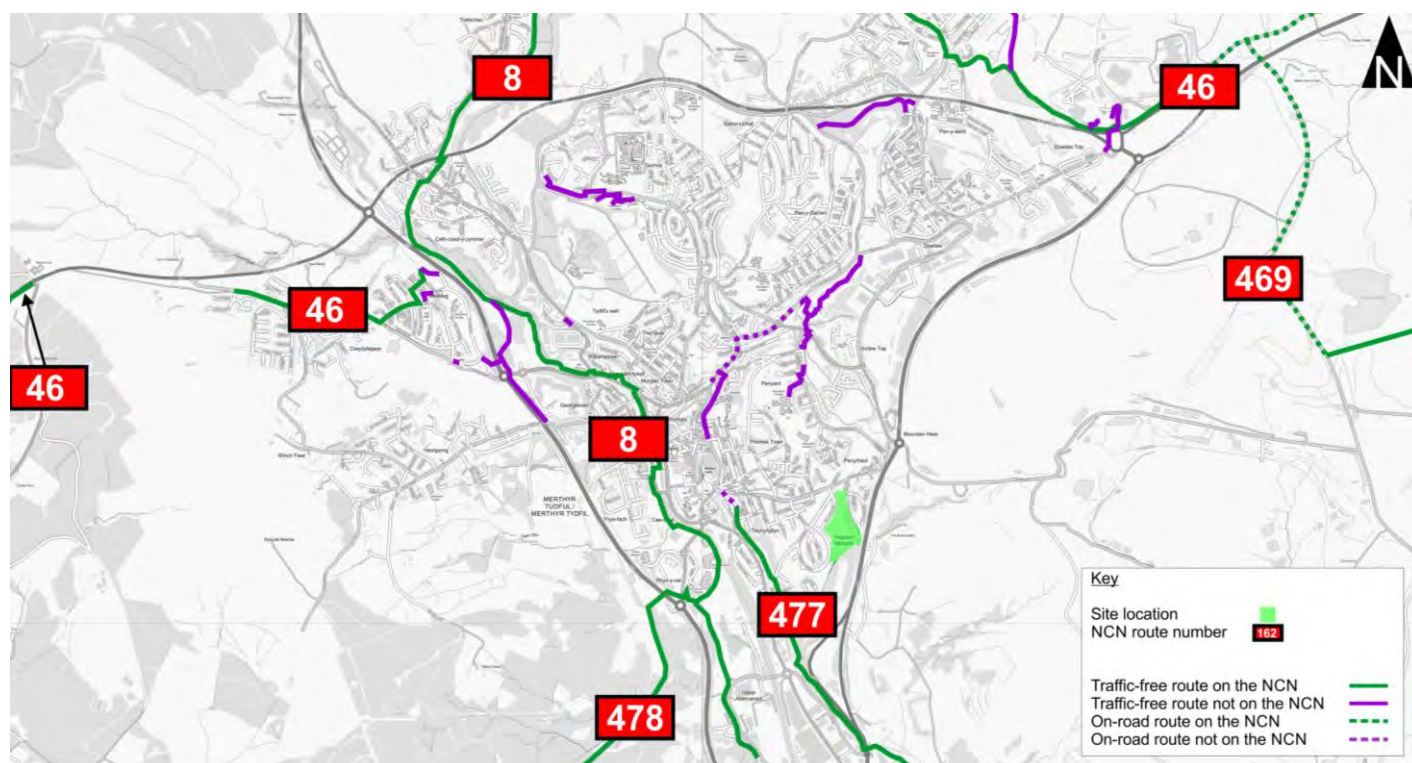
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Figure 3.4 Public Rights of Way network in the vicinity of the site

Cycling

3.3.9

The site is well connected in terms of cycle routes with a number of on and off-road cycle routes within Merthyr Tydfil providing access to a range of local facilities. The site is also situated within close proximity of a number of access points to the National Cycle Network (NCN). The location of local cycle routes within close proximity of the site is shown in **Figure 3.5** below.



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Figure 3.5 Local cycle routes in the vicinity of the site

- 3.3.10 The nearest cycle route to the site is NCN Route 477, located off Twynyrodyn Road. NCN Route (477) is mostly an off-road trail route which provides connections between Merthyr Tydfil and Edwardsville. NCN Route 477 connects with NCN Route 8 which runs to Abercynon.
- 3.3.11 Furthermore, NCN Route 8 is located approximately 1.3km west of the site, along the western side of the Taff River. This is a long-distance route which provides connections from Merthyr Tydfil to Brecon (40km), Treharris (13km), Abercynon (16km), Pontypridd (23km) and Cardiff (43km).
- 3.3.12 The NCR Route 46 also runs along the north of Merthyr Tydfil and this is a long-distance route providing connections to Neath to the west. This is accessible via the NCR Route 8.

Bus services

- 3.3.13 The nearest bus stop to the site is located on Glasier Road, approximately 400m to the west of the centre of the site. There are a number of bus services that stop within close proximity of the proposed development, as detailed in **Table 3.2** below.

Table 3.2 Summary of bus stops and routes

Route no.	Distance (m)	Route	Frequency (per hour)
Penheolferthyr			
38	400m	Merthyr Tydfil-Twynyrodyn	2
Plymouth Street			
21	1km	Merthyr Leisure Park- Abercanaid	1
24	1km	Merthyr Tydfil-Pontsticill	4 a day
78/7A	1km	Merthyr Tydfil-Pontypridd	2
79	1km	Merthyr Tydfil-Bedlinog	1
81	1km	Merthyr Tydfil-Bryngolau	3
T4	1km	Cardiff-Merthyr Tydfil	2
X4	1km	Merthyr Tydfil-Cardiff	Every 2 hours
S80	1km	Merthyr-Treharris	1
S79	1km	Merthyr-Bedlinog via Treharris	Every 2 hours
T14	1km	Cardiff-Merthyr Tydfil- Hay on Wye-Hereford	Every 2 hours
Merthyr Tydfil Bus Station			
35	1.5km	Merthyr Tydfil- Rhydybedd	5
1/2/3	1.5km	Merthyr Tydfil-Bargoed	3
27	1.5km	Merthyr-Prince Charles Hospital	5
22	1.5km	Merthyr Tydfil-Heath Park	2
89	1.5km	Aberdare-Merthyr Tydfil	Every 2 hours
25	1.5km	Merthyr Tydfil-Tefechan	4
23	1.5km	Merthyr Tydfil-Merthyr Tydfil via Trago Mills	4

3.3.14 The location of the bus stops, together with bus routes that call at these stops is shown in **Figure 3.6** over the page.

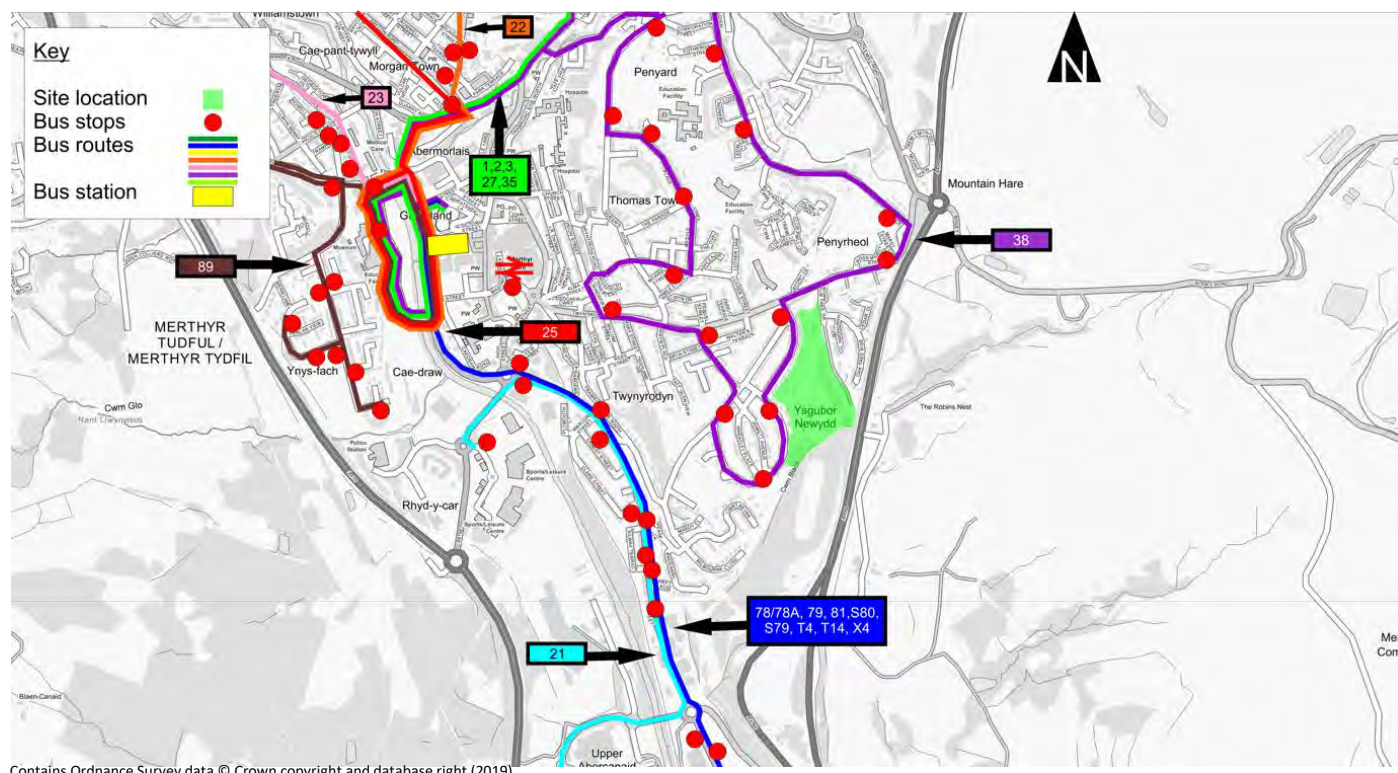


Figure 3.6 Public transport infrastructure in the vicinity of the site

Railway services

- 3.3.15 The nearest train station to the site is Merthyr Tydfil, approximately 1km to the west of the site. This station provides two services an hour to Cardiff Central, with a journey time of approximately 1hr. This services, which starts at Merthyr Tydfil, stops at Abercynon, Pontypridd, Trefforest and Cathays to the south, and provides an onward journey to Bridgend.
- 3.3.16 Merthyr Tydfil Train Station is managed by Transport for Wales (TfW), and offers free car parking for 34 vehicles, including 3 accessible parking spaces. The station has a total of ten cycle storage spaces, all of which are sheltered. The station is also accessible via bus service 38 which provides two services an hour, with a journey time of approximately 15 minutes. The station is fully accessible via step free access or ramps provided for train access.

3.4 Local highway network

- 3.4.1 The local highway network is illustrated in Figure 3.1 and summarised in **Table 3.3** below.

Table 3.3 Description of local highway network

Road name	Description
Penheolferthyr	
Description	A single carriageway, local distributor road with traffic calming measures and footway provision on both sides of the carriageway.
Carriageway width	6.8m
Speed limit	30mph, 20mph for 300m adjacent to the community centre
Street lighting	Yes, on both sides of the carriageway
Crossing facilities	Formalised crossings in the form of zebra crossings and dropped kerbs and tactile paving located at all major junctions
Bus route	Yes
Character	The road is mainly fronted by residential properties and open space on both sides of the carriageway
On-street parking	A combination of no parking restrictions and double yellow lines in the vicinity of the site
Elm Tree Grove	
Description	A single carriageway, residential road providing access to Oak Tree Rise to the east of the site. The road has footway provision on both sides of the carriageway.
Carriageway width	7.5m
Speed limit	30mph
Street lighting	Yes, on both sides of the carriageway
Crossing facilities	Dropped kerbs and tactile paving located at all major junctions
Bus route	No
Character	The road is fronted by residential properties to the east and recreational land to the west
On-street parking	No parking restrictions

Base traffic flows

3.4.2 The base traffic flows throughout the study area have been determined from fully classified turning count surveys at each of the junctions as identified below:

- Junction 1: Twynyrodyn Road/Court Street/Tramroadside N/Tesco Extra roundabout;
- Junction 2: Gilfach Cynon/Wallhead Road/Penheolferthyr junction;
- Junction 3: Penheolferthyr/Elm Tree Grove junction;
- Junction 4: Penheolferthyr/Goat Mill Road/A4102 priority junction;
- Junction 5: Goat Mill Road/A4102/A4060/Bogey Road roundabout junction;
- Junction 6: Lower High Street/High Street/A4102/A4054 Avenue De Clichy junction; and,
- Junction 7: Bro Dawel/Plymouth Street priority junction.

3.4.3 The results of the traffic surveys are presented in full in **Appendix B**.

3.5 Personal injury collisions

3.5.1 Personal injury collision data has been obtained for the period 2016 to 2020 (inclusive) for the study area. The severity of collisions and number of casualties per year is summarised in **Figure 3.7** and **Table 3.4** below.

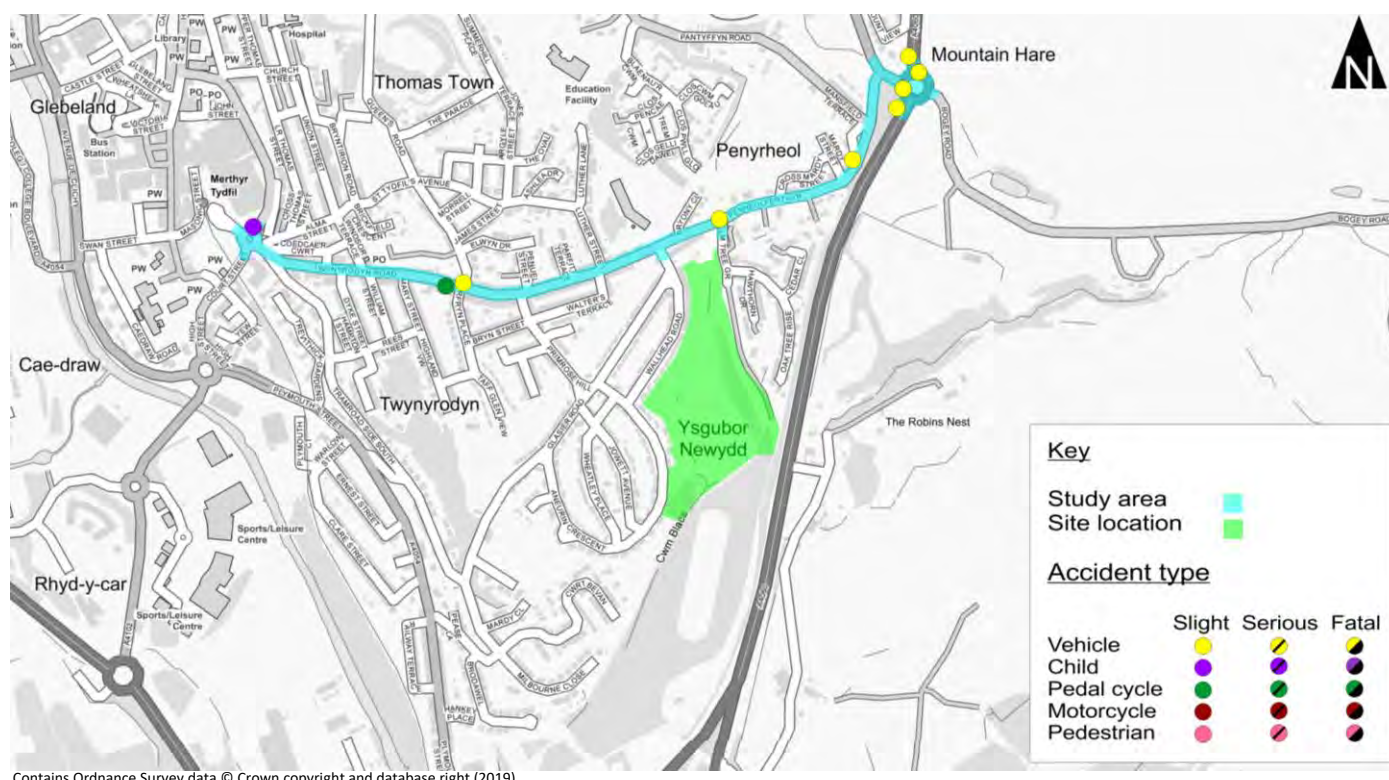


Figure 3.7 Location and severity of personal injury collision

Table 3.4 Summary of person injury collisions

Year	Personal injury			No. of casualties	Collisions involving vulnerable users			
	Fatal	Serious	Slight		Cyclist	Child	M/cyclist	Pedestrian
2016	0	0	4	7	0	0	0	0
2017	0	0	2	5	0	1	0	0
2018	0	0	1	1	1	0	0	0
2019	0	0	1	4	0	0	0	0
2020	0	0	1	2	0	0	0	0
Total	0	0	9	19	1	1	0	0

3.5.2 It can be seen from Table 3.4 above that nine collisions occurred within the last five years, resulting in 19 casualties, all sustaining slight injuries. Of these collisions, two involved vulnerable users: one involving a cyclist and one involving a child.

3.5.3 It can be seen from the figure above that the majority of collisions recorded occurred at the A4060 roundabout.

4 Development proposals

4.1.1 This section of the report outlines the proposed development including access, parking and delivery and servicing.

4.2 Proposed development

4.2.1 The Transport Assessment has been produced in support of a planning application for the development of up to 131 dwellings on land to the west of Elm Tree Grove, Twynyrodyn, Merthyr Tydfil.

4.2.2 The proposed development comprises the following mix of dwellings on site; with:

- 118 private dwellings consisting of:
 - 26 no. x 2-bedroom dwellings;
 - 71 no. x 3-bedroom dwellings; and,
 - 21 no. x 4-bedroom dwellings.
- 13 affordable dwellings consisting of:
 - 6 no. x 1-bedroom dwellings
 - 5 no. x 2-bedroom dwellings; and,
 - 2 no. x 3-bedroom dwellings.
- Car parking; and,
- Secure cycle storage within the curtilage of each dwelling.

4.2.3 An initial site layout is shown in **Figure 4.1** below.



Figure 4.1 Site layout

4.3 Pedestrian access

4.3.1 As outlined above, there is a network of public rights of way (PRoW) that run through the site, connecting to Penheolferthyr (at the north east corner) with Aneurin Crescent (at the south-west corner). These routes will be retained and incorporated within the scheme, providing a permeable development, that will allow pedestrians and cyclists to progress through the site, as well as allow pedestrians and cyclists to access the development.

4.3.2 It is also proposed to provide a number of pedestrian footpaths throughout the site which will connect to the edge of the site boundary, providing pedestrian and cycle links through the site between Elm Tree Grove, Wallhead Road and Aneurin Crescent as outlined below.

Access to Wallhead Road

4.3.3 There is an existing unmade footpath (with a minimum width of 1.5m) at the north-west corner of the site connecting the site to Wallhead Road, via the shared-surface lane (with an approximate width of 4.0m) at the rear of residential properties fronting Penheolferthyr (see Figure 4.2 below).



Figure 4.2 Pedestrian access to Wallhead Road

- 4.3.4 The existing lane provides access to the rear of the existing residential dwellings (providing passive surveillance and overspill lighting), as well as access to approximately seven garages along the southern edge of the lane. However, it is anticipated that the existing footpath linking to the site will need to be upgraded (subject to confirmation on land ownership) with a metalled surface, so that the footpath can be used throughout the year.

Access to Aneurin Crescent

- 4.3.5 At the southern end of the site, there are three existing connections on to Aneurin Crescent, which will be upgraded to provide pedestrian and cycle access to the site (see Figure 4.3 below).

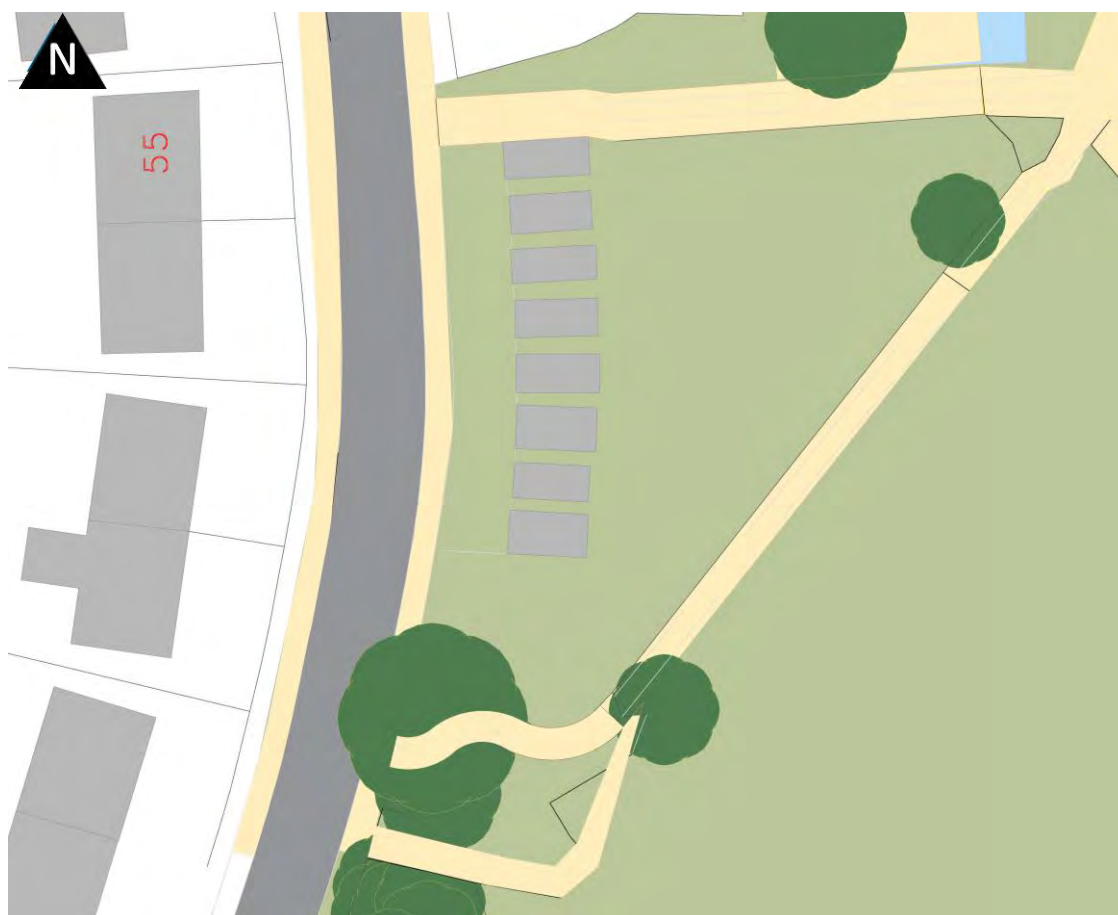


Figure 4.3 Pedestrian access to Aneurin Crescent

- 4.3.6 As part of the redevelopment of the site it is proposed (subject to confirmation on land ownership) to upgrade the surfacing of these routes, and to provide low level lighting, such that the routes can be used by pedestrians and cyclists throughout the year.
- 4.3.7 It is anticipated that the cycle-footway will measure a minimum of 2m wide and will be accessible to all members of the public.

4.4 Vehicle access

- 4.4.1 In order to access the development, it is proposed to construct a new simple priority junction on to Elm Tree Grove (approximately 5m north of the existing priority junction (Oak Tree Rise), see **Figure 4.4** below.



Figure 4.4 Proposed access arrangement onto Elm Tree Grove

- 4.4.2 The proposed access will have a carriageway width of 5.5m, with a 2.0m wide footway on both sides of the carriageway. The access then transitions to a shared surface road with a combined width of 7.5m.
- 4.4.3 The proposed access has been designed in accordance with the principles set out in Manual for Streets, which states that:
- ‘with small corner radii, large vehicles may need to use the full carriageway width to turn.’*
- 4.4.4 It is anticipated that the majority of vehicles can access the site without conflicting with other vehicles, however, it is acknowledged that the refuse vehicle will oversweep the centre-line of the side road in order to access/egress the site.

- Refuse - it is anticipated that refuse generated by the proposed development will be collected on-site by the local authority as part of an existing collection route running through Elm Tree Grove.
- Emergency vehicles - swept path analysis of a 7.7m fire tender has been carried out which shows a fire tender can successfully access the development site.
- Delivery and servicing – it is anticipated that all delivery and servicing will be undertaken on-street, with vehicles accessing the site via Elm Tree Grove.

4.4.5 A swept-path analysis of the range of vehicles likely to access and manoeuvre throughout the site is included in **Appendix C**.

4.5 Parking

Car parking

4.5.1 The proposed development adopts Merthyr Tydfil County Borough Council adopts CSS Wales – Wales Parking Standards 2008, which introduces ‘maximum’ parking standards which aims to manage traffic and reduce car dependency whilst ensuring that a development is accompanied by sufficient on-site car parking.

4.5.2 The site is located within Zone 2-6 and a parking requirement of one space per bedroom (maximum requirement of three spaces) together with visitor parking of one space per five dwellings. **Table 4.1** below sets out the required parking provision for the development of 131 residential dwellings.

Table 4.1 Wales car parking standards 2008: Residential Zones 2-6

No. of bedrooms	No. of dwellings	Parking standard	Parking requirement	Parking provision
Residents parking				
One bed	6	one space per bedroom (maximum requirement of three spaces)	6	6
Two bed	31		62	62
Three bed	73		219	192
Four bed	21		63	63
Visitor parking				
		One space per five dwellings	26	9
Total	131		376	332

4.5.3 It can be seen from the table above that the proposed provision of 332 car parking spaces is within the maximum parking standards, as set out in MTCBC’s adopted parking standards. Looking at the provision in more detail, it can be seen that the provision for the one, two and four bedroom dwellings is in accordance with the maximum car parking standards.

4.5.4 The three-bed dwellings have been provided with a parking provision of either two or three spaces per dwelling, depending on the type of three-bed dwelling provided. It is proposed to provide a total of 192 car parking spaces for the 73 no. 3-bed houses.

4.5.5 It can also be seen from Table 4.1 above that the provision of visitor parking is slightly below the maximum parking standards. However, it is anticipated that the majority of visitor parking spaces can be accommodated on street, there is sufficient parking provided throughout the development to accommodate the likely demand.

4.5.6 It is considered that the proposed level of parking is more than sufficient to accommodate the likely demand generated by the proposed development, as:

- The proposed provision of parking is within the maximum parking standards, and doesn't take account of the likely tenure of dwellings (with 10% of dwellings designated as affordable housing);
- The car parking provision for all dwelling is significantly greater than the average car ownership rates for the lower output area in which the site is located, with:
 - 1.03 cars/vans per household for all dwelling types/sizes;
 - 1.09 cars/vans per household for private dwellings; and,
 - 0.58 cars/vans per household for affordable dwellings
- The site is in a reasonably sustainable location, and is within walking distance to local facilities and amenities.

4.5.7 It is also considered that the level of car parking is appropriate for the nature of the development. As stated in Planning Policy Wales (PPW) Edition 10 '*parking standards should be applied flexibly and allow for the provision of lower levels of parking and the creation of high quality places*', and that '*local authorities should ensure that new developments provide lower levels of parking than have generally achieved in the past*'.

Cycle parking

4.5.8 Merthyr Tydfil County Borough Council sets out a cycle parking requirement of one cycle stand per five bedrooms. This is equivalent to a total of 45 cycle parking spaces, which will be provided with a combination of secure cycle storage on-street (Sheffield Stands) and cycle parking provided within the curtilage of dwellings (either garages or within dedicated cycle storage).

5 Transport characteristics

5.1 Introduction

5.1.1 In order to assess the impact of the proposed development on the existing highway network, it is necessary to assess the number of vehicle trips generated by up to 131 dwellings. This section therefore outlines the methodology used to predict the person trip generation (by mode), based on a review of the TRICS 7.8.3 trip generation database.

5.2 Issues raised by the local highway authority

5.2.1 As part of their review of the draft Transport Assessment (at the pre-application stage), the local highway authority's consultants raised issues regarding the residential trip rates used to estimate the likely volume of traffic generated by the proposed development, and the distribution of development generated flows, including:

- The trip rates used are lower than the trips rates calculated for the existing dwellings on Elm Tree Grove and Oak Tree Rise (based on the turning count survey at the Penheolferthyr/Elm Tree Grove roundabout);
- The distribution of trips is based on journey to work data, and excludes other trip purposes (retail, leisure and education) and should be based on existing turning movements at the Penheolferthyr/Elm Tree Grove roundabout;
- There is no assessment of the likely trips/impact on a Saturday; and,
- Traffic growth forecasts are incorrect.

Trip rates

5.2.2 In their comparison of trip rates, the TRICS data used in the draft Transport Assessment were only exceeded by trip rates based on:

- the existing turning Penheolferthyr/Elm Tree Grove roundabout;
- their own TRICS analysis, which is based on a large selection of sites (excluding London and Republic of Ireland); and
- an independent survey(s) at a residential development - Tree Tops, in Caldicot, Monmouthshire.

5.2.3 The traffic surveys undertaken at the Penheolferthyr/Elm Tree Grove junction include a significant proportion of parents turning into Elm Tree Grove (from Penheolferthyr) parking along Elm Tree Grove, walking children to school, and then returning to their vehicle exiting the site during the morning peak period. These additional vehicles are unrelated to the existing residential dwellings along Elm Tree Grove/Oak Tree Rise, and, therefore, provide an unreliable account of the likely vehicle trip generation associated with the proposed development.

- 5.2.4 The TRICS analysis undertaken by Redstart includes 20 sites that are within 5 miles of significant population areas (i.e. greater than 50,000 residents). The analysis undertaken in draft Transport Assessment was based on maximum population of 15,000 within 1 mile and a maximum population of 50,000 within 5 miles. The population within Merthyr Tydfil is approximately 43,000, and it is considered that the analysis within the draft Transport Assessment is much more representative of the proposed development than the analysis undertaken on behalf of the Local Highway Authority.
- 5.2.5 The two surveys referenced by Redstart (the details of which weren't included in their TA Audit) are both located in Caldicot. Caldicot has a significantly smaller population than Merthyr Tydfil (approximately 11,000) and has significantly fewer facilities within walking distance than the proposed development, therefore, the surveys at these two sites are not representative.
- 5.2.6 It should also be noted that the proposed development comprises 10% affordable housing, which is likely to generate a lower number of trips than private dwellings. It is therefore considered that the trip rates outlined in the draft Transport Assessment are reproduced in Section 5.3 below, are representative of the proposed development, and provide a robust analysis of the likely impact of the proposed development.

Distribution

- 5.2.7 The percentage of retail and leisure trips represent a very small percentage of overall trips during the AM peak period, and therefore the likely impact on the distribution of development generated trips will be negligible.
- 5.2.8 Also, as outlined above, the traffic surveys undertaken at the Penheolferthyr/Elm Tree Grove junction include a significant proportion of parent drop-off in the AM peak period, which impacts on the likely distribution of vehicle trips.
- 5.2.9 It is therefore considered that the distribution of vehicle trips outlined in the draft Transport Assessment, is a reasonable proxy for the likely distribution of future vehicle trips.

Saturday analysis

- 5.2.10 The volume of trips generated by a residential development on a Saturday is significantly lower than the weekday peak periods, and therefore the analysis within the draft Transport Assessment is based on a 'worst-case' scenario. In any event the scope of the Transport Assessment was discussed and agreed with the Local Highway Authority from the outset, and it was agreed that only a weekday analysis is required.

Growth factors

- 5.2.11 The growth factors have been adjusted in accordance with the methodology outlined in the TA Audit.

5.3 Trip generation

5.3.1 In order to predict the number of trips generated by the proposed development of 131 residential dwellings TRICS (v.7.8.3) trip generation database has been reviewed in order to predict the likely level of trips generated by the proposed development, sites have been selected on the basis of the following criteria:

- Land use: Residential; houses privately owned
- Survey type: Multi-modal;
- Survey days: Monday, Tuesday and Friday;
- Number of units: 16 to 180;
- Location of selected sites: Suburban area and Edge of Town; and,
- Geographical areas: UK (excluding London, Northern Ireland and Republic of Ireland).

5.3.2 A total of nine sites were selected, with this data is summarised in **Table 5.1** below and presented in full in **Appendix D**.

Table 5.1 Total trip generation: 131 residential dwellings (Privately owned)

Time period	Arrival trip rate	No. of arrivals	Depart trip rate	No. of depart	Total trip rate	Total no. of trips
Total people						
8am-9am	0.207	27	0.852	112	1.059	139
5pm-6pm	0.585	77	0.295	39	0.88	115
7am-7pm	3.847	504	4.284	561	8.131	1065
Pedestrians						
8am-9am	0.051	7	0.293	38	0.344	45
5pm-6pm	0.144	19	0.042	6	0.186	24
7am-7pm	1.04	136	1.207	158	2.247	294
Cyclists						
8am-9am	0.004	1	0.011	1	0.015	2
5pm-6pm	0.007	1	0.007	1	0.014	2
7am-7pm	0.07	9	0.075	10	0.145	19
Public transport user						
8am-9am	0.002	0	0.058	8	0.06	8
5pm-6pm	0.03	4	0.004	1	0.034	4
7am-7pm	0.151	20	0.191	25	0.342	45
Vehicles						
8am-9am	0.132	17	0.346	45	0.478	63
5pm-6pm	0.302	40	0.174	23	0.476	62
7am-7pm	2.021	265	2.133	279	4.154	544

5.3.3 It can be seen from the table above that the proposed development is likely to generate up to 63 vehicle movements (two-way) in the AM peak and 62 vehicle movements (two-way) in the PM peak.

- 5.3.4 It can be seen that driving is likely to be the preferred mode of transport, contributing to 51% of all daily trips. However, the percentage of walking trips is relatively high, representing 28% of all trips generated throughout the day.

5.4 Assignment and distribution of development generated traffic

- 5.4.1 The distribution of development generated traffic has been based on the 2011 Journey to Work census data for the lower super output area in which the site is located. Development generated traffic flows during the AM and PM peak period are outlined in **Appendix E**.
- 5.4.2 Each destination has been assigned routes based on the most direct and appropriate direction of travel. The distribution of the development traffic is presented in full in Appendix E and summarised in **Table 5.2** below.

Table 5.2 Distribution of development generated traffic

Route	Description	% of development traffic	No. of vehicles AM PEAK		No. of vehicles PM PEAK	
			Arrival	Depart	Arrival	Depart
A	North on A4060	6	1	3	2	1
B	South on A4060	29	5	13	11	7
C	Goat Mill Road North	21	4	10	8	5
D	Glasier Road	10	2	5	4	2
E	Avenue De Clichy	29	5	13	12	7
F	South A4102	5	1	2	2	1
Total		100	17	45	40	23

5.5 Future traffic flows

- 5.5.1 As outlined in section 1, the impact of the proposed development has been assessed for 2024, 2029, and 2034 future year scenarios to coincide with the anticipated completion date, and year of 'completion + 10 years'.
- 5.5.2 In order to obtain the base traffic flows (i.e. with no development traffic) in 2024, 2029 and 2034, the surveyed traffic flows (2019) have been factored using locally adjusted NTM growth factors. The factors to be applied to the base (surveyed) flows are identified in **Table 5.3** below.

Table 5.3 NTM growth factors

Period	NTM growth factors
2019 to 2024	
Weekday AM	1.0394
Weekday PM	1.051
2019 to 2029	
Weekday AM	1.0959
Weekday PM	1.0947
2019 to 2034	

Weekday AM	1.1435
Weekday PM	1.1416

- 5.5.3 It should be noted that the above growth factors take account of committed development within the local area, as the factors are based on the most recent planning data contained in the Local Plan. The 2019, 2024, 2029 and 2034 base flows are set out in **Appendix F**.

Final future traffic flows

- 5.5.4 The final future traffic flows have been obtained by combining the development generated traffic flows (identified in Appendix E), with the 2024, 2029 and 2034 base traffic flows (identified in Appendix F) and presented in full in **Appendix G**.

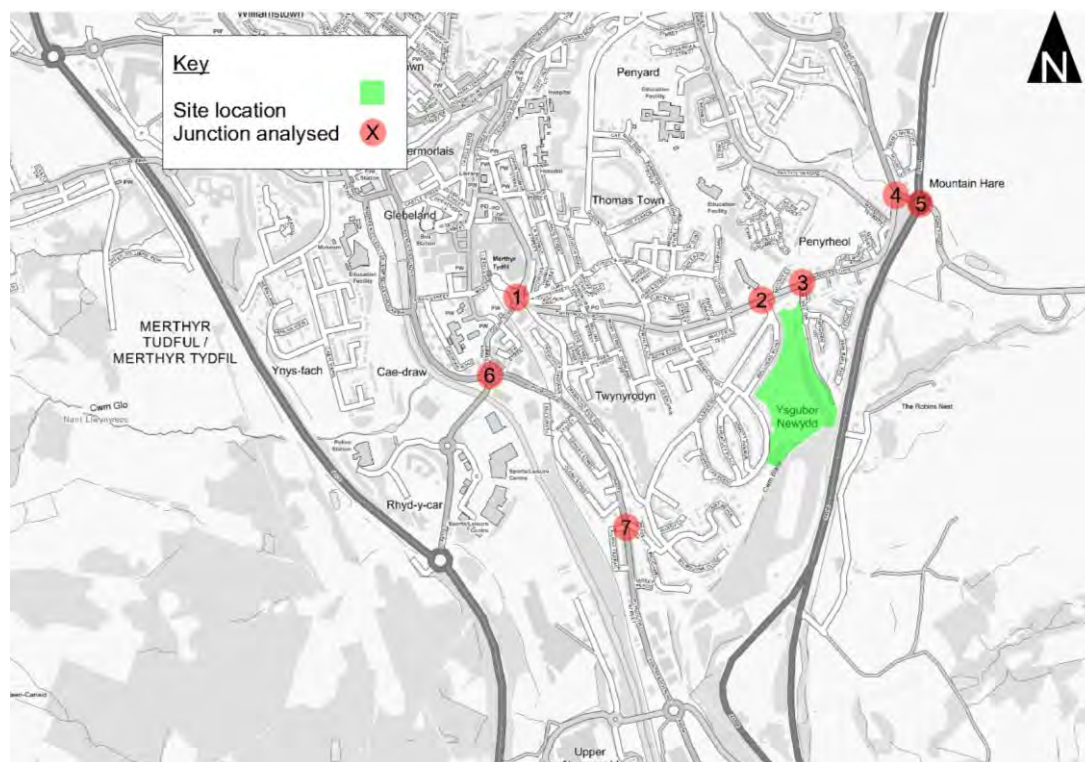
6 Impact of development generated traffic flows

6.1 Introduction

6.1.1 This section of the report considers the potential impact of the development proposals on the surrounding highway network, as agreed with the Local Highway Authority, which includes:

- Junction 1: Twynyrodyn Road/Court Street/Tramroadside N/Tesco Extra roundabout;
- Junction 2: Gilfach Cynon/Wallhead Road/Penheolferthyr junction;
- Junction 3: Penheolferthyr/Elm Tree Grove junction;
- Junction 4: Penheolferthyr/Goat Mill Road/A4102 priority junction;
- Junction 5: Goat Mill Road/A4102/A4060/Bogey Road roundabout junction;
- Junction 6: Lower High Street/High Street/A4102/A4054 Avenue De Clichy junction; and,
- Junction 7: Bro Dawel/Plymouth Street priority junction.

6.1.2 Each of these junctions is outlined in **Figure 6.1** below.



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Figure 6.1 Location of surveyed junctions

6.2 Issues raised by the local highway authority

6.2.1 As part of their review of the draft transport Assessment (at the pre-application stage), the local highway authority's consultants raised issues regarding the junction capacity analysis/modelling, as follows:

- A number of the junction parameters appear to be overly generous;
- The majority of junctions have not been validated against observed queues; and,
- The modelling will need to be re-run based on revised trip generation and trip distribution.

Junction parameters

6.2.2 The junction parameters, have been reviewed and amended where appropriate, based on the results of a further site visit to measure the junction parameters.

Model validation/calibration

6.2.3 The junctions have been validated/calibrated based on queue length surveys that were undertaken at the same time as the turning count surveys in December 2019.

Modelling

6.2.4 As outlined in Section 5 of this report, it is considered that the generation, distribution and assignment of development generated trips used in the draft Transport Assessment are robust, and represent a worst-case scenario. However, where appropriate the analysis has been amended to account for revised junction parameters and to reflect the observed queue lengths.

6.3 Percentage impact analysis

6.3.1 In order to determine the impact of the proposed development at each junction, a percentage impact assessment has been undertaken based on the trip rates identified in Table 5.1 above. The percentage impact assessment is summarised in **Table 6.1** below, and a more detailed percentage impact assessment at each junction, including the junction dimensions, is outlined in **Appendix H**.

Table 6.1 Percentage impact assessment

		Junction 1				Junction 2				Junction 3			
		Base	Dev	Base + Dev	%inc.	Base	Dev	Base + Dev	%inc.	Base	Dev	Base + Dev	%inc.
2019	AM	1719				782		782		786		786	
	PM	1904		1904		746		746		773		773	
2024	AM	1787	21	1808	1.17	813	26	839	3.07	817	62	879	7.05
	PM	2001	21	2023	1.06	784	28	812	3.45	812	63	875	7.20
2029	AM	1884	21	1905	1.11	857	26	883	2.92	861	62	923	6.71
	PM	2084	21	2106	1.02	817	28	845	3.31	846	63	909	6.93
2034	AM	1966	21	1987	1.06	894	26	920	2.80	899	62	961	6.45
	PM	2174	21	2195	0.98	852	28	880	3.18	882	63	945	6.66
		Junction 4				Junction 5				Junction 6			
		Base	Dev	Base + Dev	%inc.	Base	Dev	Base + Dev	%inc.	Base	Dev	Base + Dev	%inc.
2019	AM	1499		1499		2314		2314		3404		3404	
	PM	1723		1723		2627		2627		4270		4270	
2024	AM	1558	34	1593	2.16	2405	21	2427	0.88	3538	21	3559	0.59
	PM	1811	35	1846	1.90	2761	22	2783	0.78	4487	21	4509	0.48
2029	AM	1643	34	1677	2.05	2536	21	2557	0.84	3731	21	3752	0.56
	PM	1886	35	1921	1.82	2876	22	2897	0.75	4674	21	4695	0.46
2034	AM	1714	34	1749	1.97	2646	21	2667	0.80	3893	21	3914	0.54
	PM	1967	35	2002	1.75	2999	22	3021	0.72	4874	21	4896	0.44
		Junction 7											
		Base	Dev	Base + Dev	%inc.								
2019	AM	1076		1076									
	PM	1270		1270									
2024	AM	1118	6	1125	0.57								
	PM	1335	7	1341	0.49								
2029	AM	1179	6	1186	0.54								
	PM	1461	7	1468	0.45								
2034	AM	1230	6	1237	0.52								
	PM	1668	7	1675	0.39								

6.3.2 In accordance with Technical Advice Note (TAN) 18 – Transport:

‘... an increase in turning movements in the order of 5% as material in most cases, that is a 5% increase of traffic using any link of the junction.’

6.3.3 It can be seen from the table above that the percentage increase in traffic flows exceeds the 5% threshold at one of the seven junctions assessed, including the main access junction Penheolferthyr/Elm Tree Grove junction.

6.3.4 It can also be seen that the percentage increase in traffic flows exceeds 3% at Gilfach Cynon/Wallhead Road/Penheolferthyr roundabout. Therefore, to provide a robust analysis of the potential impact of the proposed development this junction has also been assessed.

6.3.5 The impact of development generated traffic at this junction is discussed in more detail below.

6.4 Junction capacity analysis

Junction 2 - Gilfach Cynon/Wallhead Road/Penheolferthyr roundabout

6.4.1 The operation of the existing junction (see **Figure 6.2** below) has been assessed for both the AM and PM peak periods, based on observed queues on each approach to the junction.



Figure 6.2 Gilfach Cynon/ Wallhead Road/ Penheolferthyr roundabout

Queue lengths

6.4.2 The observed queue lengths, on each approach to the junction are outlined in **Table 6.2** below.

Table 6.2 Observed queue length

Average maximum queue									
Time	AM peak				Time	AM peak			
	Penheolf'	Wallhead Road	Gilfach Cynon	School access		Penheolf'	Wallhead Road	Gilfach Cynon	School access
08:00	0	0	1	0	17:00	1	0	0	0
08:05	0	1	1	0	17:05	1	1	1	0
08:10	0	0	0	0	17:10	0	0	0	0
08:15	1	0	0	0	17:15	0	0	0	0
08:20	0	0	1	0	17:20	1	1	1	0
08:25	0	1	0	0	17:25	0	1	0	0
08:30	0	1	0	0	17:30	0	0	1	0
08:35	1	0	1	0	17:35	0	0	1	0
08:40	0	1	1	0	17:40	1	1	1	0
08:45	0	0	0	0	17:45	1	1	0	0
08:50	1	0	0	0	17:50	0	1	1	0
08:55	0	0	1	0	17:55	0	0	1	0

6.4.3 The operation of the junction has been undertaken using Junctions 9 – ARCADY, based on the surveyed flows. After an initial model run, the capacities of each arm at each junction were manually adjusted (increased or decreased), and the model re-run until the modelled queues replicated the observed queues (iterative process).

6.4.4 The results of the analysis, together with the junction dimensions, are presented in full in **Appendix I** and summarised in **Table 6.3** below.

Table 6.3 Junction capacity analysis – Junction 2

	Base				Base + development			
	8am-9am		5pm-6pm		8am-9am		5pm-6pm	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
2019								
Penheolferthyr	0.53	1	0.43	<1				
Wallhead Road	0.57	1	0.39	<1				
Gilfach Cynon	0.26	<1	0.37	<1				
Twynyroddyn Community Sch	0.05	<1	0.00	<1				
2024								
Penheolferthyr	0.55	1	0.43	<1	0.58	1	0.46	<1
Wallhead Road	0.60	1	0.39	<1	0.62	1	0.44	<1
Gilfach Cynon	0.27	<1	0.37	<1	0.27	<1	0.41	<1
Twynyroddyn Community Sch	0.06	<1	0.00	<1	0.06	<1	0.00	<1
2029								
Penheolferthyr	0.58	1	0.47	<1	0.61	1	0.48	<1
Wallhead Road	0.65	1	0.43	<1	0.67	2	0.46	<1
Gilfach Cynon	0.28	<1	0.41	<1	0.29	<1	0.42	<1
Twynyroddyn Community Sch	0.06	<1	0.00	<1	0.06	<1	0.00	<1
2034								
Penheolferthyr	0.61	1	0.48	<1	0.64	1	0.50	1
Wallhead Road	0.68	1	0.45	<1	0.71	2	0.49	<1
Gilfach Cynon	0.29	<1	0.45	<1	0.30	<1	0.45	<1
Twynyroddyn Community Sch	0.06	<1	0.00	<1	0.06	<1	0.00	<1

6.4.5 It can be seen from the table above that the existing junction operates within its theoretical capacity up to (and including) the 2034 with development scenarios, with a maximum RFC of 0.71 and queue of two vehicles on the Wallhead Road approach to the junction in the AM peak period in the 2034 with development scenarios.

6.4.6 It can also be seen that the proposed development will have a marginal impact on the operation of the junction.

Junction 3 – Penheolferthyr/Elm Tree Grove roundabout

- 6.4.7 The operation of the existing junction (see **Figure 6.3** below) has been assessed for both the AM and PM peak periods, based on observed queues on each approach to the junction.



Figure 6.3 Penheolferthyr and Elm Tree Grove roundabout

Queue lengths

- 6.4.8 The observed queue lengths, on each approach to the junction are outlined in **Table 6.4** below.

Table 6.4 Observed queue length

Average maximum queue							
AM peak				PM peak			
	Penheol-ferthyr (e)	Elm Tree Grove	Penheol-ferthyr (w)	Time	Penheol-ferthyr (e)	Elm Tree Grove	Penheol-ferthyr (w)
08:00	0	0	0	17:00	0	0	1
08:05	0	1	0	17:05	0	0	1
08:10	0	0	1	17:10	0	0	0
08:15	1	1	0	17:15	0	1	1
08:20	0	0	0	17:20	0	0	0
08:25	0	0	1	17:25	1	0	0
08:30	1	0	0	17:30	1	1	0
08:35	1	1	0	17:35	1	0	1
08:40	0	1	0	17:40	0	1	1
08:45	0	0	1	17:45	0	0	0
08:50	1	1	0	17:50	1	0	1
08:55	0	1	0	17:55	0	1	1

- 6.4.9 The operation of the junction has been undertaken using Junctions 9 – ARCADY, based on the surveyed flows. After an initial model run, the capacities of each arm at each junction were manually adjusted (increased or decreased), and the model re-run until the modelled queues replicated the observed queues (iterative process).
- 6.4.10 The results of the analysis are presented in full in **Appendix J** and a summary of the results are shown in **Table 6.5** below.

Table 6.5 Junction capacity analysis – Junction 3

	Base				Base + development			
	8am-9am		5pm-6pm		8am-9am		5pm-6pm	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
2019								
Penheolferthyr (E)	0.37	<1	0.33	<1				
Elm Tree Grove	0.32	<1	0.15	<1				
Penheolferthyr (W)	0.44	<1	0.58	<1				
Unnamed road	0.00	<1	0.00	<1				
2024								
Penheolferthyr (E)	0.39	<1	0.35	<1	0.40	<1	0.37	<1
Elm Tree Grove	0.34	<1	0.16	<1	0.53	1	0.25	<1
Penheolferthyr (W)	0.46	<1	0.62	<1	0.48	<1	0.65	1
Unnamed road	0.00	<1	0.00	<1	0.00	<1	0.00	<1
2029								
Penheolferthyr (E)	0.42	<1	0.36	<1	0.43	<1	0.40	<1
Elm Tree Grove	0.36	<1	0.17	<1	0.55	1	0.26	<1
Penheolferthyr (W)	0.48	<1	0.64	1	0.50	1	0.67	2
Unnamed road	0.00	<1	0.00	<1	0.00	<1	0.00	<1
2034								
Penheolferthyr (E)	0.44	<1	0.38	<1	0.44	<1	0.40	<1
Elm Tree Grove	0.38	<1	0.18	<1	0.58	1	0.28	<1
Penheolferthyr (W)	0.50	<1	0.50	1	0.53	1	0.70	2
Unnamed road	0.00	<1	0.00	<1	0.00	<1	0.00	<1

6.4.11 It can be seen from the table above that the existing junction has sufficient capacity to accommodate traffic growth to 2034 together with development generated traffic, with a maximum RFC of 0.70, and a queue of two vehicles on the Penheolferthyr approach to the junction in the PM peak period for the 2034 with development scenarios.

6.4.12 It can also be seen that the proposed development will have a marginal impact on the operation of the junction.

6.5 Summary

6.5.1 It can be seen from the percentage impact assessment that the increases in peak hour traffic flows as a result of the development exceed 5% at only two junctions (out of the seven junctions surveyed as part of this Transport Assessment):

- Junction 2 - Gilfach Cynon/Wallhead Road/Penheolferthyr junction; and,
- Junction 3 - Penheolferthyr/Elm Tree Grove junction.

6.5.2 Further analysis indicates that these two junctions have sufficient capacity to accommodate the additional traffic generated by the proposed development of 131 dwellings, with minimal increase in queues and delays.

7 Transport implementation strategy

7.1 Introduction

7.1.1 In accordance with TAN 18, a Transport Implementation Strategy needs to be included in the Transport Assessment process, which sets the objectives and targets relating to managing travel demand.

7.1.2 **Table 7.1** over the page outlines the Transport Implementation Strategy for the proposed development, which provides additional details on the measures outlined in Section 4. These measures are organised into four categories and includes likely timescale for implementation. The three categories are:

- Pedestrian, cyclists and public transport user;
- Travel Plan; and,
- Car based user provision.

Table 7.1 Transportation implementation strategy

Measure		Commentary	Timescale for implementation
Pedestrian users provision			
A	Provision and enhancement of ‘pedestrian’ direction signs outside the site, to direct users to the site, and to other town centre facilities and amenities.	This is likely to be a condition of consent, with details submitted to and approved in writing by the local planning authority.	This will need to be completed prior to the beneficial occupation of the site.
B	Provision of a network of pedestrian routes between the site and the surrounding network.		
C	Improvements/upgrades to existing footpath links into the site from both Wallhead Road and Aneurin Crescent.		
D	Provision of ‘Active Travel’ information within Travel Plan Welcome Pack, including walk distances/times to local amenities and facilities within 2km, highlighting the benefits of walking to work.		
Cycle users			
A	Provision of secure cycle parking spaces in accordance with the adopted parking standards.	This is likely to be a condition of consent, with details submitted to and approved in writing by the local planning authority	This will need to be completed prior to the beneficial occupation of the site.
B	Provision of ‘Active Travel’ information within the Travel Plan Welcome Pack, including cycle distances/times from local amenities and facilities within the vicinity of the site, as well as neighbouring settlements, and public transport facilities.		This will need to be completed prior to the beneficial occupation of the site.
Public transport users			
A	Provision of public transport information within Travel Plan Welcome Pack, including the nearest bus stops, routes to/from the town centre and timetables.	This is likely to be a condition of consent, with details submitted to and approved in writing by the local planning authority.	This will be provided beyond first occupation of the site.

Travel Plan			
A	Encouraging the use of more sustainable modes (walking, cycling car sharing and public transport)	This is likely to be a condition of consent, with details submitted to and approved in writing by the local planning authority.	The Travel Plan will need to be completed prior to 50% occupation of the site.
B	Setting mode share targets		
C	On-going monitoring		

8 Summary and conclusions

8.1 Summary

- 8.1.1 Lime Transport has been commissioned by Persimmon Homes East Wales to prepare a Transport Assessment in support of a planning application for the development of up to 131 dwellings on land at Twynyrodyn, Merthyr Tydfil.
- 8.1.2 The scope of the Transport Assessment has been discussed and agreed with the local highway authority, and includes an assessment of the impact at the following junctions:
- Junction 1: Twynyrodyn Road/Court Street/Tramroadside N/Tesco Extra roundabout;
 - Junction 2: Gilfach Cynon/Wallhead Road/Penheolferthyr/Twynyrodyn Community School roundabout;
 - Junction 3: Penheolferthyr/Elm Tree Grove roundabout;
 - Junction 4: Penheolferthyr/Goat Mill Road/A4102 priority junction;
 - Junction 5: Goat Mill Road/A4102/A4060/Bogey Road junction
 - Junction 6: Lower High Street/High Street/A4102/ A4054 Avenue De Clichy roundabout; and,
 - Junction 7: Bro Dawel/Plymouth Street priority junction.

8.2 Policy

- 8.2.1 It is considered that the proposed development at Twynyrodyn is in accordance with the relevant national, regional and local planning policies, as it:
- Is an allocated site, within the urban area of Merthyr Tydfil (which is identified as a primary growth area);
 - Is located within easy walking and cycling distance of the majority of local facilities and amenities, as well as employment;
 - Is accessible by walking, cycling and public transport (bus and rail).

8.3 Existing site

- 8.3.1 The site is within easy walking and cycling distance of Merthyr Tydfil Town Centre, a well-established town centre with a range of retail, financial, employment and education facilities.
- 8.3.2 The site is also within walking distance of existing bus stops along Penheolferthyr, Glasier Road and Aneurin Ceresent. The rail station in Merthyr Tydfil is within 1.2km of the site.

- 8.3.3 There are a total of nine collisions that occurred within the study area within the last five years, resulting in 19 casualties, all sustaining slight injuries. Of these collisions, two involved vulnerable users: one involving a cyclist and one involving a child.

8.4 Development proposals

- 8.4.1 The proposed development will comprise of up to 131 dwellings on site, incorporating of:

- 118 private dwellings consisting of:
 - 26 no. x 2-bedroom dwellings;
 - 71 no. x 3-bedroom dwellings; and,
 - 21 no. x 4-bedroom dwellings.
- 13 affordable dwellings consisting of:
 - 6 no. x 1-bedroom dwellings
 - 5 no. x 2-bedroom dwellings; and,
 - 2 no. x 3-bedroom dwellings.
- Car parking; and,
- Secure cycle storage within the curtilage of each dwelling.

Pedestrian and vehicular access

- 8.4.2 There is a network of public rights of way (PRoW) that run through the site, connecting to Penheolferthyr (at the north east corner) with Aneurin Crescent (at the south-west corner). These routes will be retained and incorporated within the scheme, providing a permeable development, that will allow pedestrians and cyclists to progress through the site, as well as allow pedestrians and cyclists to access the development.
- 8.4.3 It is also proposed to provide a number of pedestrian footpaths throughout the site which will connect to the edge of the site boundary, providing pedestrian and cycle links through the site between Elm Tree Grove, Wallhead Road and Aneurin Crescent
- 8.4.4 In order to provide a vehicular access to the development, it is proposed to construct a new simple priority junction on to Elm Tree Grove (approximately 5m north of the existing priority junction (Oak Tree Rise). The vehicle access will also include pedestrian footways on both sides of the carriageway.

Car parking

- 8.4.5 As part of the development it is proposed to provide a total of 332 car parking spaces, which is within the Merthyr Tydfil County Borough Council maximum parking standards.

- 8.4.6 The three-bed dwellings have been provided with a parking provision of either two or three spaces per dwelling, depending on the type of housing provided. This is below the maximum provision of one space per bedroom (maximum requirement three spaces), however, based on car ownership census data the provision of 192 spaces for the 73 3-bedroom dwellings is it is considered ample to accommodate the likely demand.
- 8.4.7 It can also be seen that the provision of visitor parking is slightly below the maximum parking standards. It is anticipated that the majority of visitor parking spaces can be accommodated on street, and there is sufficient parking provided throughout the development to accommodate the likely demand.

8.5 Travel characteristics

- 8.5.1 It is anticipated that the proposed development up to 63 vehicle movements (two-way) in the AM peak and up to 62 vehicle movements (two-way) in the PM peak. It is also anticipated that driving likely to be the preferred modal choice, representing 51% of total daily trips, with walking representing 28% of total daily trips.

Distribution

- 8.5.2 The distribution of development generated traffic has been based on the 2011 Journey to Work census data for the lower super output area in which the site is located. Each destination has been assigned routes based on the most direct and appropriate direction of travel.
- 8.5.3 In order to obtain the base traffic flows (i.e. with no development traffic) in 2024, 2029 and 2034, the surveyed traffic flows (2019) have been factored using locally adjusted NTM growth factors. The growth factors take account of committed development within the local area, as the factors are based on the most recent planning data contained in the Local Plan. These growth factors, together with the development generated traffic has been used to calculate the 2024, 2029 and 2034 with development scenarios.

Likely impact

- 8.5.4 It can be seen from the analysis that the percentage increase in traffic flows only exceeds the 5% threshold (outlined in TAN18) at two of the seven junctions assessed as part of this Transport Assessment. These are the two junction closest to the site:
- Junction 2 - Gilfach Cynon/Wallhead Road/Penheolferthyr junction;
 - Junction 3 - Penheolferthyr/Elm Tree Grove junction.
- 8.5.5 Further analysis indicates that both junctions have sufficient capacity to accommodate the likely increase in traffic flows as a result of both background growth (to 2034) and the proposed development.
- 8.5.6 Furthermore, the impact of the proposed development could be further reduced through the implementation of a robust residential travel plan.

8.6 Conclusions

- 8.6.1 In summary, it is considered that the proposed development - which is an allocated site in the current LDP - can be accommodated within the existing transport network.
- 8.6.2 It is considered that the 'impact' of the development can be reduced through the implementation of a robust residential travel plan that seeks to reduce reliance of private vehicles in favour of more sustainable and active travel modes.