

12 EFFECTS ON ALL TRAVELLERS

12.1 Introduction

This chapter addresses impacts in relation to effects on all travellers associated with the Scheme. It includes an assessment of impacts on pedestrians, cyclists, equestrians and vehicular travellers.

The following policies and plans are considered relevant to the Scheme in relation to this Chapter:

12.1.1 National and Regional Policies and Plans

The Wales Transport Strategy (One Wales: Connecting the Nation)

The Wales Transport Strategy (One Wales: Connecting the Nation) places high emphasis on the promotion of sustainable transport networks that safeguard the environment while strengthening the country's economic and social life. Promotion of walking and cycling is key to reducing greenhouse gas emissions and other environmental impacts, which is one of the priorities of the Strategy. Improving access between key settlements and sites, integrating local transport, enhancing international connectivity and increasing safety and security are also priorities of the Strategy, which relate to all travellers.

The Active Travel (Wales) Act 2013

The Active Travel (Wales) Act 2013 completed its passage through the National Assembly for Wales in October 2013 and came into force in 2014. The purpose of the Act is to require local authorities to continuously improve facilities and routes for pedestrians and cyclists and to prepare maps identifying current and potential future routes for their use. In relation to the Scheme, the Bill specifically makes provision for: 'requiring the Welsh Ministers and local authorities, in constructing and improving highways, to have regard to the desirability of enhancing the provision made for walking and cycling'.

Technical Advice Note 18

Technical Advice Note (TAN) 18 should be read in conjunction with *Planning Policy Wales (2002)* which sets out the land use planning policies of the Welsh Assembly Government (the Assembly Government).

Section 6.2 states:

'Local authorities should promote walking as the main mode of transport for shorter trips through the use of their planning and transport powers. Consideration should be given to ways in which areas and developments can be made more attractive and safer for pedestrians through the arrangement of land uses and design policy. When preparing development plans, design guidance, master plans and in determining planning applications authorities should:

- *support the use of public rights of way for local journeys'*

Section 6.4 states:

'Local authorities should aim to develop an effective network of cycle routes, including safe routes to schools. Development plans, design guidance, and master plans should include encourage cycling through:

- *identification of new cycle routes utilising existing highway (including public rights of way where appropriate), disused railway lines, space alongside rivers and canals, parks and open space'*

Planning Policy Wales Edition 8 (January 2016)

Planning Policy Wales sets out the land use planning policies of the Welsh Government. It is supplemented by a series of Technical Advice Notes.

Section 8.2.3 states *'Cycling should also be encouraged for short trips and as a substitute for shorter car journeys or, as part of a longer journey when combined with public transport. Local authorities should, taking into account the requirements of the Active Travel (Wales) Act 2013, encourage the implementation of specific measures to develop safe cycling, including new or improved routes, and secure parking and changing facilities in major developments and at transport interchanges. Where appropriate, planning authorities should also seek to assist the completion of the national cycle network, and of key links to and from the network.'*

Section 11.1.13 states *'Local authorities should seek to protect and enhance the rights of way network as a recreational and environmental resource. They are also encouraged to promote the national cycle network, long distance footpaths, bridleways, canals, and the use of inland waters and disused railways as greenways for sustainable recreation.'*

Section 11.2.5 states *'The development plan should consider the scope to use disused land and routes as parks, linear parks or greenways in urban areas. It should encourage the provision of safe cycle routes and footpaths. Where recreational use of redundant railway lines or spaces alongside canals or rivers is proposed, the plan should ensure that there is no detriment to adjoining users, wildlife or flood defences.'*
Draft North Wales Joint Local Transport Plan 2015

The Draft North Wales Joint Local Transport Plan (LTP) for Anglesey and Gwynedd sets out a delivery programme for 2015-2020, and a framework for schemes until 2030. It seeks to remove barriers to economic growth by improving connections to employment. There is a focus on the most deprived communities, such as rural communities, seeking to address the issues faced with improvements to the walking and cycling connections.

Outcome 4 of the LTP is 'Increased Levels of Walking and Cycling for both necessary travel and recreation, by residents and visitors.'

Objective 9 entitled 'Encouraging Sustainable Travel' is concerned with infrastructure improvements to increase levels of walking and cycling both for travel and for leisure. This may include cycle routes, footway/ footpath provision, and safe routes to school.

High Level Intervention 5 – Access to Services, commits to improving connectivity along the A4086 between Llanrug and Caernarfon.

The LTP proposes the Caernarfon to Lon Ogwen Multi-User-Path (MUP). This MUP will run alongside the B4366 and A4244 between Caernarfon and the Lon Ogwen Cycle route at Felin Hen. The path would be constructed within the existing highway boundary, with short sections requiring land where existing road widths are not sufficient. The scheme could be incorporated into the B4366 road widening scheme at Pengelli.

12.1.2 Local Policies and Plans

Gwynedd Unitary Development Plan 2001-2016

The Gwynedd Unitary Development Plan establishes a policy framework and makes provision for development needs for the period from 2001 to 2016. It is used by Gwynedd Council to guide and control development, providing a basis for consistent and appropriate decisions on planning applications.

The plan includes the following relevant policy:

Policy CH22 (Cycling Network, Paths and Rights Of Way)

All parts of the cycling network, paths and public rights of way (including footpaths, public footpaths, bridle paths and byways) will be safeguarded and promoted by:

- *assessing any proposal that would infringe upon a cycle route, path or public right of way with the aim of ensuring that the cycle route, path or public right of way is satisfactorily incorporated within the development and if this cannot be achieved that:
 - i. *appropriate provision is made to divert the route, or;*
 - ii. *an alternative new route is provided which safely and attractively maintains or improves the local network**
- *refusing any proposal which is likely to prohibit plans to extend the existing cycling network, paths and public rights of way unless an alternative path can be provided which is just as safe, attractive and accessible.*
- *Policy CH29 (Safeguarding and Improving Links For Pedestrians): Proposals within Centres and Villages that fail to provide safe, attractive and direct links for pedestrians across and out of the site, wherever there are clear opportunities to make such provision, will be refused. From a planning point of view, special emphasis will be placed on the provision of footpaths from a development site to:
 - i. *a bus stop or station or a bus or train exchange point*
 - ii. *community services and facilities in the area e.g. school, village shop, children's play area*
 - iii. *existing cycle networks, paths and public rights of way**

Joint Local Development Plan (LDP) for Anglesey and Gwynedd – Draft

The Joint Local Development Plan (LDP), scheduled to be adopted by April 2016, comprises a deployment strategy of sustainable development over the next 15 years.

The LDP promotes walking and cycling opportunities, on a local level, as more work is needed to improve healthier lifestyles amongst the residents of the area by ensuring that existing and new communities have an opportunity to participate in physical activity, including opportunities for cycling and walking.

The LDP states that all development proposals are required to progress towards achieving the relevant objectives and policies:

- Objective 8: Reducing the need to travel and encourage alternative modes of transport, placing particular emphasis on walking, cycling and using public transport.
- Strategic Objective 21: Improve and maintain safe, efficient, high quality, modern and integrated transport networks to employment, services and education/ training facilities particularly by foot, bicycle and public transport, thus reducing where possible the number of journeys in private cars.
- Strategic Policy PS2: Alleviating the effects of climate change: add to opportunities for walking or cycling in preparation for a time when fuel will become scarcer or more expensive.
- Strategic Policy PS22: Support transport improvements that maximise accessibility for all modes of transport, but particularly by foot, cycle and public transport. This is set out to be achieved by improving and enhancing the public footpath and cycleway network to improve the accessibility by these modes of travel to encourage people to live healthier lifestyles.
- Sustainability Appraisal (SA) Deposit Plan, Feb 2015
 - i. SA Objective 10: Promote and enhance good transport links, including the proposed increase in the percentage of cycle network and access to services and facilities by public transport, walking and cycling.

Gwynedd Rights of Way Improvement Plan 2007 – 2017

The Rights of Way Improvement Plan provides a ten-year challenge and opportunity for the council to adapt and review the network to meet modern day needs and so to help deliver wider benefits for both Gwynedd's residents and its visitors. The following all have relevance to Non-Motorised Users (NMU).

- Development proposals will be refused if they create an unacceptable increase in traffic on Rural Lanes where walkers, cyclists or horse riders are expected to be the main users.
- One of the main responsibilities of the Rights of Way Section is to advise in the planning process on the effect of proposed development on Public Rights of Way and assist in the processing of applications to create, divert or extinguish Public Rights of Way to suit the needs of developers, including through public inquiry and beyond if necessary.
- Cyclists want the existing rights of way networks to be better integrated with planned cycle routes and those currently found on the highway network, in addition to linking towns and villages with the countryside.

12.2 Methodology

'Effects on all Travellers' was a new topic chapter in the DMRB Volume 11, Section 3 (Environmental Assessment Techniques) and introduced under IAN 125/09^{12.1}. At present the Environmental Assessment Techniques section of the DMRB Volume 11 is being revised and there is no specific methodology developed for 'Effects on all Travellers'. The IAN therefore advises that existing methodologies in relation to Pedestrians, Cyclists, Equestrians^{12.2} and Vehicle Travellers^{12.3} are used.

In relation to the non-motorised user assessment, the study area is dictated by the residential areas and areas of significant community facilities of Bethel to the north-east, Waunfawr to the south-east, Dinas to the south-west and Caernarfon to the north-west. These determine the origin and destination of (NMU) trips. Community facilities are shown in Volume 2, Figure 12.1 a – e. In relation to vehicle travellers, the study area is the Scheme itself.

12.2.1 Non-motorised users

In relation to impacts on NMUs, the DMRB Volume 11, Section 3, Part 8 (June 1993)^{12.2} recommends that the following methods be employed:

- *Refine the information on facilities and their catchment areas by asking for information from owners and managers of community facilities about number and home area of the customers or users. In cases where pedestrians' and others' travel patterns are complex and a scheme could have a major impact, origin/ destination surveys should be considered. Where relevant, it is important to estimate separately the numbers of people in vulnerable groups who will be particularly affected. This will usually be done either by including these groups as separate categories if pedestrian counts are made or by obtaining estimates of the number of users or residents of vulnerable facilities (for example, a primary school, community centre or old people's home).*
- *Verify the earlier assessment of changes in journey length and amenity and community severance, allowing for any subsequent modifications (for example, to traffic forecasts, or the route alignment or mitigation on which the earlier assessment was based).*
- *Where cyclists will be significantly affected, obtain the views of the Cycle Touring Club (CTC) and local cycling groups and the local highway authority officer responsible for cycling provision on the implications on the preferred route. The views of the Overseeing Department's Regional Cycling Officer should then be obtained through the overseeing Department's Project Manager.*
- *The results of the assessment at Stage 3, to be described in the Environmental Statement should comprise a report assessing the number and location of pedestrians and others and their community facilities affected by the preferred route, taking proposed mitigation into account. The report should also describe any benefits to pedestrians and others from reductions in traffic along the existing route network. A map should be included which shows the community facilities, their catchment areas and routes used by pedestrians and others which are affected by the Scheme.*

The above methodology is over 20 years old (published in 1993) and some aspects may not be as relevant to the assessment of road schemes today. It is for this reason

that the guidance is currently being revised. Some slight changes to this method are therefore proposed to make it more relevant to the existing situation. However, the underlying principles of the method, which relate to the assessment of effects on the routes used by NMUs for recreation or to access important facilities within their community, will not alter.

In order to assess impacts on NMU journey patterns in the area, it is not considered relevant to write to managers etc. of significant community facilities to gain information about number and home areas of the users. In order to obtain this type of information, as well as other relevant information that relates to NMUs, the following Public Information Exhibitions were held:

- 17th March and 25th June 2015 – Celtic Royal Hotel, Caernarfon
- 18th March and 26th June 2015 – Y Canolfan, Bontnewydd
- 19th March and 27th June 2015 – Y Capel, Caeathro

Additionally, desk based research and site surveys have been undertaken during 2015 to establish the locations of significant community facilities within the study area. A summary of these results are presented in the NMU Context Report (refer to Volume 3, Appendix I.1) and NMU Audit Report (refer to Volume 3, Appendix I.2). The level of information currently available is therefore considered more than adequate as the basis for assessment.

Since the publication of the DMRB Assessment guidance in relation to pedestrians and 'others' (shown above), there are further requirement to ensure NMUs are fully considered in the design process of road construction. An NMU Audit has been undertaken in accordance with HD 42/05^{12.4}. Background information of relevance to NMUs has been reported in an NMU Context Report (refer to Volume 3, Appendix I.1) and NMU Audit Report (refer to Volume 3, Appendix I.2). The findings of these reports contribute to the assessment of impacts on NMUs in this Chapter.

Much of the supporting information required by the DMRB methodology and which has been reported in the NMU Context Report and NMU Audit Report is addressed under the 'Baseline Conditions' section below. Taking this into account the assessment of the NMU aspect of this section will be reported under the following headings:

- Severance of Public Rights of Way and other key NMU routes
- Impacts on cyclists and cycleways
- Relief from existing severance

In order to inform the assessment of relief from existing severance traffic data using an Average Annual Daily Traffic (AADT) core value figure has been used (refer to Volume 2, Figure 2.8) The percentage change in the AADT (12 hours) level from the Do Minimum scenario (2018) and the AADT (12 hours) level from the opening year (2018) associated with the Scheme is used to determine the level of relief from severance.

12.2.2 Assessment criteria for non-motorised users

The tables below describe the magnitudes of impact for new severance (Table 12.2.1) and relief from existing severance (Table 12.2.2). These are based on the criteria in DMRB Volume 11, Section 3 Part 8 (June 1993)^{12.2}. Table 12.2.3 describes the magnitudes of impact for the beneficial effects for the improvements to public rights of way as a result of the Scheme. This is based on the criteria used in a number of WeITAG^{12.5} appraisals for transport studied in relation to Physical Fitness.

Table 12.2.4 describes NMU receptor sensitivity, which is also based on the criteria in DMRB Volume 11, Section 3 Part 8 (June 1993)^{12.2}.

Magnitude of Impact

The definitions of magnitude of impacts are described in Tables 12.2.1 to Table 12.2.3 below.

Table 12.2.1 – Impact magnitude for new severance

Magnitude of Impact	Description
Severe	<p><i>People are likely to be deterred from making trips to an extent sufficient to induce a re-organisation of their habits. This would lead to a change in the location of centres of activity or in some cases to a permanent loss to a particular community. Alternatively, considerable hindrance will be caused to people trying to make their existing journeys. Such effects can be brought about by, for example:</i></p> <ul style="list-style-type: none"> • <i>Pedestrian at-grade crossing of a new road carrying over 16,000 AADT in the opening year,</i> • <i>An increased length of journey of over 500m; or</i> • <i>Three or more hindrances set out under 'slight' or two or more set out under 'moderate'.</i>
Moderate	<p><i>Some residents, particularly children and elderly people, are likely to be dissuaded from making trips. Other trips will be made longer or less attractive, for example:</i></p> <ul style="list-style-type: none"> • <i>Two or more hindrances set out under 'Sltio single trips; or</i> • <i>Pedestrian at-grade crossing of a new road carrying between 8,000 – 16,000 AADT in the opening year.</i> • <i>Journeys will be increased by 250 – 500m</i>
Slight	<p><i>In general the current journey pattern is likely to be maintained, but there will probably be some hindrance to movement for example:</i></p> <ul style="list-style-type: none"> • <i>Pedestrian at-grade crossing of a new road carrying below 8,000 AADT; or</i> • <i>A new bridge will need to be climbed or a subway traversed; or</i> • <i>Journeys will be increased by up to 250m.</i>
Neutral	<p><i>No impacts on journey patterns or hindrance of movement.</i></p>

Table 12.2.2 – Impact magnitude for relief from existing severance

Magnitude of impact	Description
<i>Substantial</i>	<i>where traffic AADT levels are predicted to reduce by approximately > 60% from existing levels</i>
<i>Moderate</i>	<i>where traffic AADT levels are predicted to reduce by approximately 30 – 60% from existing levels</i>
<i>Slight</i>	<i>where traffic AADT levels are predicted to reduce by approximately 30% from existing levels</i>

Table 12.2.3 – Impact magnitude for beneficial effects from improvements to PRoW

Magnitude of impact	Description
<i>Large Beneficial</i>	<i>Scheme is expected to substantially increase travel by active modes</i>
<i>Moderate Beneficial</i>	<i>Scheme is expected to moderately increase travel by active modes</i>
<i>Slight Beneficial</i>	<i>Scheme is expected to slightly increase travel by active modes</i>

Sensitivity of Impact

Sensitivity of impact is outlined in Table 12.2.4 below.

Table 12.2.4 – NMU Receptor sensitivity

Receptor sensitivity	Description
High	<i>Vulnerable groups (the elderly, wheelchair users and children) who use pedestrian / cyclist routes to reach key community facilities (e.g. schools, doctors surgeries and shops)</i>
Medium	<i>Pedestrian, cyclist or equestrian routes that are used as a registered Public Right of Way or as part of popular recreational trail</i>
Low	<i>Pedestrian, cyclist or equestrian routes that are used on an infrequent basis, have low amenity value and do not provide connection with significant community facilities</i>

Significance of Impact

Table 12.2.5 below outlines the significance of impacts on new severance and relief from existing severance and is adapted from DMRB Volume 11, Section 3 Part 9^{12.2}.

Table 12.2.5 – Pedestrians and others significance of impact

Magnitude	Sensitivity		
	High	Medium	Low
Severe / substantial / high	Major Adverse / Beneficial	Major - Moderate Adverse / Beneficial	Moderate – Minor Adverse / Beneficial
Moderate / medium	Major – Moderate Adverse / Beneficial	Moderate – Minor Adverse / Beneficial	Minor Adverse / Beneficial
Slight / low	Moderate – Minor Adverse / Beneficial	Minor Adverse / Beneficial	Minor / Negligible
Neutral	Negligible	Negligible	Negligible

Assessment of Amenity

Assessing the amenity of a route focuses on the general pleasantness of the journey and considers exposure to traffic, noise, dirt, air quality, and/or visual impact. A measurement of magnitude is inappropriate for the assessment of amenity. Instead the assessment involves a qualitative description, which describes any perceived changes in amenity value of the journey, resulting from the proposed options (as recommended in DMRB Volume 11, Section 3, Part 8, (June 1993) Para. 4.2).

NMU Consultation

The JV Team has worked closely with Gwynedd Council (GC) in relation to impacts of the Scheme on NMUs. The GC Traffic, Development Control and Projects Team Manager, Recreational Routes Officer and Rights of Way Officer have been consulted with in order to achieve the optimal solution for the stopping up and diversion of Public Rights of Way affected by the Scheme (refer to Volume 3, Appendix I.3). Three meetings are detailed in the NMU Context Report and NMU Audit Report along with additional e-mail correspondence. GC were also provided an opportunity to comment on the Environmental Scoping Report (refer to Volume 3, Appendix A.2).

In preparation of the NMU Context Report and NMU Audit Report the following user groups were consulted:

- CTC Eryri
- The Caernarfon and Dwyfor Ramblers
- The British Horse Society
- Sustrans (refer to Volume 3, Appendix I.4)
- Ramblers Cymru
- CTC Cymru
- Vehicle Travellers

In relation to impacts on Vehicle Travellers, the DMRB Vol. 11, Section 3 Part 9^{12.3} recommends that the following methods be used:

- An assessment of views from the road should be made, taking account of landscape assessments and any modifications to the preferred route.
- An assessment of driver stress should be carried out taking account (for example) of finalised junction arrangements for the preferred route.

Chapter 2 of DMRB Volume 11, Section 3, Part 9^{12.3} gives further detail on assessing views from the road and defines 'view from the road' as the '*extent to which travellers, including drivers, are exposed to the different types of scenery through which a route passes*'. Aspects to be considered are:

- The types of scenery or the landscape character as described and assessed for the baseline studies,
- The extent to which travellers may be able to view the scene,
- The quality of the landscape as assessed for the baseline studies,
- Features of particular interest or prominence in the view.

Chapter 4 of DMRB Vol. 11, Section 3, Part 9^{12.3} gives details on assessing driver stress and identifies three main components of driver stress as follows:

- Frustration,
- Fear of potential accidents, and
- Uncertainty relating to the route being followed.

The guidance states that "frustration is caused by a driver's inability to drive at a speed consistent with their own wishes in relation to the general standard of the road. Congestion, road works or difficulty overtaking slow moving vehicles are all causes of driver frustration. The main factors leading to fear are the presence of other vehicles, inadequate sight distances and the likelihood of pedestrians, particularly children, stepping into the road. Route uncertainty is caused primarily by signing that is inadequate for individual's purposes."

12.2.3 Assessment Criteria for Vehicle Travelers

Views From the Road

There are four categories which should be used in assessing travellers' ability to see the surrounding landscape (as set out in DMRB Vol. 11, Section 3, Part 9, Chapter 2^{12.3}). These being:

- *No View – road deep in cutting or contained by false cuttings, environmental barriers or adjacent structures.*
- *Restricted view – frequent cuttings or structures blocking view.*
- *Intermittent view – road generally at ground level but with shallow cuttings or barriers at intervals.*

- *Open view – view extending over many miles, or only restricted by existing landscape features.*

For the purpose of this study the Scheme has been sub divided into sections of similar characteristics. The assessment has been based on the current landscape proposals as shown in Volume 2, Figure 7.1

The driver’s ability to view the surrounding landscape has been assessed at design year 15, unless otherwise stated when the plants would have reached sufficient maturity to meet their environmental function. It has been assumed that by design year (year 15) the trees would have be effective in visual mitigation. The ability to see the surrounding landscape has been based on a driver’s eye level of 1.2m unless otherwise stated. For the purpose of this assessment it is assumed that lighting would be confined to junction roundabouts. As part of the assessment reference has been made to seasonal variation within the planting. This would influence the ability to see the surrounding landscape throughout the year in addition to the duration for which views would be visible. Where embankments and cuttings are present, approximate height difference above the existing ground level have been indicated. For the purpose of this assessment shallow cuttings means those less than 3m as views of the surrounding landscape would be obtained from high sided vehicles.

Driver Stress

The DMRB guidance states that on account of available research evidence, the use of finely graded assessments of driver stress is not appropriate and a three-point descriptive scale should be used:

- *Low,*
- *Moderate,*
- *High.*

The DMRB guidance in relation to Vehicle Travellers (Volume 11, Section 3, Part 9, Chapter 4)^{12.3} states that there have been no reliable correlations established between physical factors and driver stress. However, guidance is given on the appropriate category of stress for use in environmental assessments, providing the speeds and flows exist during peak hour flows for at least one kilometre of route (refer to Table 12.2.6 and 12.2.7 below which are sourced from DMRB, Volume 11, Section 3, Part 9, Chapter 4). The guidance states that the assessment should be made for the worst year in the first fifteen after opening.

Table 12.2.6 Dual Carriageway Roads

Average peak hour flow per lane, in flow Units* / 1 hour	Average Journey Speed km/hr		
	Under 60	60 - 80	Over 80
Under 1200	High**	Moderate	Low
1200 - 1600	High	Moderate	Moderate
Over 1600	High	High	High

* A car or light van equals one flow unit. A commercial vehicle over 1 ½ tons unladen weight or a public service vehicle equals 3 flow units.

** ‘Moderate’ in urban areas.

Table 12.2.7 Single Carriageway Roads

Average peak hour flow per lane, in flow Units* / 1 hour	Average Journey Speed km/hr		
	Under 50	50 - 70	Over 70
Under 600	High**	Moderate	Low
600 – 800	High	Moderate	Moderate
Over 800	High	High	High

* A car or light van equals one flow unit. A commercial vehicle over 1 ½ tons unladen weight or a public service vehicle equals 3 flow units.

** 'Moderate' in urban areas.

12.2.4 Limitations and Assumptions

As described in Section 12.2.1 the methodology for non-motorised users was published over 20 years ago and so some aspects may not be as relevant for the assessment of road schemes today, which constitutes a limitation. However, the methodology has been slightly modified (as described in Section 12.2.1) to make it more relevant to the existing situation.

The assessment of NMU route amenity relies on qualitative descriptions by the assessor which is subjective. There is also a degree of subjectivity in the assessment of views from the road although guidance is given regarding the openness of views (refer to Section 12.2.3).

12.3 Baseline Conditions

12.3.1 Non-motorised users

Trip generators/significant community benefits

The NMU Context Report has identified a number of 'trip generators'. These include places of employment, education, retail, recreation or community facilities that the public might travel to on foot or by bicycle. They are located within the centre of Caernarfon and throughout the surrounding residential and industrial estates. Significant trip generators identified are listed below and are show in Volume 2, Figure 12.1 (a – e).

Schools

- Ysgol Santes Helen R C Primary School
- Ysgol Gynradd Maesincla Primary School
- Ysgol Syr Hugh Owen
- Ysgol Pendalar
- Ysgol Yr Hendre
- Ysgol Bontnewydd

Services

- Gwynedd Council
- Caernarfon Magistrates Court
- Caernarfon County Court
- Caernarfon Police Station

Leisure

- Arfon Leisure and Tennis Centre
- Go Karting
- Caernarfon Castle

Health

- Market street surgery
- Borrass Park surgery
- Bron seiont surgery
- Oasis dental care
- Dental surgery
- Church street Dental surgery
- Bryn Seiont Hospital

Retail

- Tesco
- Morrisons
- Asda

Employment

- Gwynedd Council
- Cibyn Industrial estate

Pedestrian Crossings

- A total of 11 pedestrian crossings exist within the centre of Caernarfon and in the surrounding residential and industrial estates.

Desire Lines

Desire Lines are routes that people travelling on foot or by bicycle are likely to take in order to access areas of work, employment of community and leisure facilities (i.e. trip generators). Indicative desire lines are presented in the NMU Context Report having been derived using 2011 Office for National Statistics (ONS) census information, broken down into Middle Layer Super Output Areas (MSOA). The boundaries of the MSOAs and indicative desire lines are shown in Volume 2, Figure 12.1 (a – e). The following is a summary of the points presented in the NUM Context Report:

- 0 – 10 % of total trips originating in MSOA 006 (likely to be Caernarfon) were by bicycle and also have their destination in MSOA 006 (likely to be Caernarfon).
- 0 – 10 % of total trips originating in MSOA 006 (likely to be Caernarfon), are by bicycle and have their destination in MSOA 007 (in places such as Bontnewydd and Waunfawr).
- 30 – 40 % of total trips originating in MSOA 006 (likely to be Caernarfon) are by foot and also have their destination in MSOA 006 (likely to be Caernarfon).
- The isolated nature of the settlements in MSOA 007 (in places such as Bontnewydd and Waunfawr) and MSOA 004 suggest that internal trips flows within these MSOAs are within local towns and villages.

- 10 – 30 % of total trips originating in MSOA 006 (likely to be Caernarfon) are by foot and have their destination in MSOA 007 (in places such as Bontnewydd and Waunfawr).
- 10 – 20 % of total trips originating in MSOA 006 (likely to be Caernarfon) are by foot and have their destination in MSOA 004.
- 0 – 10 % of total trips originating in MSOA 004 are by foot and have their destination in MSOA 007 (in places such as Bontnewydd and Waunfawr).

The NMU Context Report suggests a number of indicative Desire Lines cross the proposed Scheme. Given the pattern and size of settlements these are likely to be more prominent between Caernarfon and Bontnewydd, Caernarfon and Caeathro and Caernarfon and Llanrug.

12.3.2 Public Rights of Way and Cycleways

Existing Public Rights of Way are shown in Volume 2, Figure 12.1 (a – e). The NMU Context Report (Volume 3, Appendix I.1) provides a description of the Public Rights of Way and their general use and condition. Volume 2, Figure 12.2 (a – d) and 12.3 (a – d) show impacts and mitigation on rights of way during construction and operational phases respectively.

There are two National Cycle Network (NCN) routes in the study area; NCN 8 and NCN 61.

NCN 8, also known as the Lon Las Cymru (North), is a 257 mile signed route from Cardiff to Holyhead. The Caernarfon to Y Felinheli stretch of NCN 8 is also known as Lon Las Menai; an off-road route along the former railway running parallel to the Menai Strait.

NCN 61, also known as Lon Las Gwyrfa, follows quiet country lanes and tracks leading out of Caernarfon towards the village of Waunfawr.

Public rights of way, cycleways and permissive paths affected by the Scheme are listed in Table 12.3.1.

The Scheme does not sever any land allocated as 'open access land' under the Countryside Rights of Way (CRoW) Act 2000 and therefore, there is no public access over privately owned land adjacent to the Scheme.

**Table 12.3.1 – Public Rights of Way and Cycleways affected by the Scheme
(south to north)**

Right of way type	Number	Location	Summary of effect
Cycleway	NCN 8	Goat Roundabout	8 cyclists per day (AADF; Department for Transport) at Bontnewydd and Plas Menai Roundabout. GC report approximately 33 cyclists and 66 pedestrians per day in a peak month. Temporary crossing/diversion provided during construction. Realigned during operation; the cycleway would be routed around the eastern side of Goat roundabout.
Footpath	PRoW Llanwnda Rhif 19	300 m north-north-east of Goat Roundabout	Gwynedd Council usage category of 3. Temporary crossing/diversion provided during construction. Severance of footpath during operation; the footpath would be realigned along the eastern boundary of the Scheme and across it via an underpass to re-join its existing alignment.
Footpath	PRoW Llanwnda Rhif 10	500 m east-north-east of Dinas	Gwynedd Council usage category of 3. Temporary crossing/diversion provided during construction. Severance of footpath during operation; the footpath would be realigned across the Scheme via an overbridge and footway and then along the western boundary of the Scheme to re-join its existing alignment.
Cycleway	NCN 8	350 m north-west of Bontnewydd WHR Station	8 cyclists per day (AADF; Department for Transport) at Bontnewydd and Plas Menai Roundabout. GC report approximately 33 cyclists and 66 pedestrians per day in a peak month. Alignment unchanged during construction. Alignment unchanged during operation; the cycleway would cross the scheme adjacent to the Welsh Highland Railway via an underpass.

Right of way type	Number	Location	Summary of effect
Footpath	PRoW Bontnewydd Rhif 27 and PRoW Caernarfon Rhif 19	350 m north of Bontnewydd WHR Station	Gwynedd Council usage categories of 4. PRoW Bontnewydd Rhif 27 and PRoW Caernarfon Rhif 19 are not severed by the Scheme directly. However, the road both join is severed. During construction a temporary crossing will be provided in order to maintain access between PRoW Bontnewydd Rhif 27 and PRoW Caernarfon Rhif 19. During operation an NMU footbridge is provided.
Cycleway	Regional Cycleway 61	1.35 km north-east of Bontnewydd WHR Station	Anecdotal evidence from GC that usage numbers range from 523-2801 during peak season (usually July). Temporary crossing/diversion provided during construction. Severance of cycleway during operation; the cycleway would be realigned to the west and across the scheme via an underpass with its tie-in point on Penybryn Road being moved ~35 m to the west of its existing location.
Footpath	PRoW Bontnewydd Rhif 26 and PRoW Waunfawr Rhif 32	625 m west of Caeathro	Gwynedd Council usage category of 3. Temporary crossing/diversion provided during construction. Severance of footpath during operation; the footpath would be realigned along the eastern boundary of the Scheme and across it via an overbridge before being routed along a footway to its original terminus.
Footpath	PRoW Waunfawr Rhif 31	625 m west of Caeathro	Gwynedd Council usage category of 2. Temporary crossing/diversion provided during construction. Severance of footpath during operation; the footpath would join PRoW Bontnewydd Rhif 26's realignment (along the eastern boundary of the Scheme and across it via an overbridge before being routed along a footway to its original terminus).
Footpath	PRoW Llanrug Rhif 36	1 km north-east of the Cibyn Industrial Estate	Gwynedd Council usage category of 3. Temporary crossing/diversion provided during construction. Severance of footpath during operation; the footpath would be

Right of way type	Number	Location	Summary of effect
			realigned along the eastern boundary of the Scheme and across it via an underpass before being routed north to re-join its original alignment.
Shared use path	Proposed in the draft Joint LDP for Anglesey and Gwynedd	100 m west of existing B4366 Roundabout	Currently only a proposal in the draft Joint LDP for Anglesey and Gwynedd. Temporary crossing/diversion provided during construction. Alignment remains largely the same during operation; as the B4366 shared use path is currently only a proposal there is no cyclist/pedestrian crossing proposed at the new B4366 Roundabout.
Cycleway	NCN 8	Plas Menai Roundabout	8 cyclists per day (AADF; Department for Transport) at Bontnewydd and Plas Menai Roundabout. GC report approximately 33 cyclists and 66 pedestrians per day in a peak month. Temporary crossing/diversion provided during construction. Alignment remains largely the same during operation; as a result of proposed realignments to existing roads at Plas Menai Roundabout, the cycleway would cross side roads at a safer distance away from the Roundabout.

NMU Flows

During the NMU Audit it was interpreted that the Scheme does not incur significant impact on any of the Public rights of Way (only minor diversions). Therefore, the collection of usage data was not carried out.

To improve the way that GC conducts its duties in relation to maintenance issues, a categorisation system was introduced in 1998, based on levels of apparent usage of Public Rights of Way and their current or potential utility. The JV Team has used this data to understand the relative importance of the Public Rights of Way affected by the Scheme. The categories are:

- Category 1 - Paths that facilitate people's movement. These will usually already have significant usage or form connections within towns, villages or between public transport facilities, car parks and pleasure attractions.
- Category 2 - Popular paths used mainly for pleasure including paths around communities, circular walks or access to beaches.

- Category 3 - Paths, whilst being less used, form significant connections between the paths in categories 1 and 2 or between communities.
- Category 4 - Paths with only occasional use but still form part of a full and effective network. These may include potential links between communities where there is currently little to encourage walking.

The majority of Public Rights of Way affected by the Scheme have been categorised as 3, with one categorised as 2 and one as 4. Therefore, in general the Public Rights of Way affected form significant connections between category 1 and 2 paths but are used less.

NCN 8 is reported to have 8 cyclists per day (AADF; Department for Transport) at Bontnewydd and Plas Menai Roundabout. GC report that approximately 33 cyclists and 66 pedestrians per day in a peak month use the cycleway.

Data for NCN 61 is anecdotal with GC reporting that usage numbers range from 523-2801 during peak season (usually July).

Traffic Data

Table 12.3.2 below shows baseline traffic figures (AADT 12 hours 'Do Minimum' 2018) compared with predicted traffic figures for the opening year (AADT 12 hours 'Yellow' 2018) (refer also to Volume 2, Figure 2.8). This information is used when assessing impacts in relation to community severance.

Table 12.3.2 Baseline traffic data compared with predicted opening year traffic data

	2018 12 hours 'Do Minimum' AADT	2018 12 hours 'Yellow' AADT	% Increase / Decrease
1 - A487 (Goat Roundabout to Llanwnda Roundabout)	12243	1682	86 % decrease
2 - A487 (Llanwnda Roundabout to ~200 metres north of Llanwnda)	16915	3075	82 % decrease
3 - A487 (~200 metres north of Llanwnda to ~300 metres south of Bontnewydd)	18121	4317	76 % decrease
4 - A487 (~300 metres south of Bontnewydd to ~150 metres north of Bontnewydd)	18822	5551	71 % decrease
5 - Lôn Caeathro (junction with A487 at Bontnewydd to junction)	4458	1071	76 % decrease

	2018 12 hours 'Do Minimum' AADT	2018 12 hours 'Yellow' AADT	% Increase / Decrease
with un-named road ~1 kilometre south-west from Caeathro)			
6 - A487 (~150 metres north of Bontnewydd to junction with Pen-y-bryn Road)	8112	6237	23 % decrease
7 - Un-named road (junction with Lôn Caeathro ~1 kilometre south-west of Caeathro to Caeathro)	13	12	8 % decrease
8 - Lôn Caeathro (junction with un-named road ~1 kilometre from Caeathro to Caeathro Roundabout)	4396	654	85 % decrease
9 - Pen-y-bryn Road - Rhos Bach Lane (junction with A487 ~1.3 kilometres north of Bontnewydd to Lôn Caeathro)	85	85	No Change
10 - A487 (junction with Pen-y-bryn Road to X Roundabout)	15098	8537	43 % decrease
11 - Pontrug Way (Caeathro Roundabout to junction with un-named road at Glan Gwna Hall)	4607	1204	74 % decrease
12 - A4085 (Caeathro to Caeathro Roundabout)	2625	1970	25 % decrease
13 - A4085 (Caeathro to Pont Peblig)	2872	2315	19 % decrease
14 - Un-named road/Pontrug Way (Caeathro to Pont-rug)	2983	992	67 % decrease
15 - St Helen's Road (Caernarfon)	1723	1299	25 % decrease
16 - A4085 (Pont Peblig to A487)	4858	4144	15 % decrease
17 - Castle Hill (Caernarfon)	1311	1267	3 % decrease

	2018 12 hours 'Do Minimum' AADT	2018 12 hours 'Yellow' AADT	% Increase / Decrease
18 - A487 (A4086 Roundabout to Ty Coch Farm/PROW Caernarfon Rhif 2)	16142	9357	42 % decrease
19 - Pool Side (Caernarfon)	5572	5601	1 % increase
20 - A4086 (A4086 Roundabout to Llanberis Road Roundabout)	10399	8530	18 % decrease
21 - Castle Ditch/Castle Square (Caernarfon)	1306	1279	2 % decrease
22 - B4366 (X Roundabout to PROW Caernarfon Rhif 2)	4305	3600	16 % decrease
23 - A4086 (Cibyn Industrial Estate to Llanberis Road Roundabout)	7792	6604	15 % decrease
24 - A4086 (Pont-rug to Cibyn Industrial Estate)	5326	6350	19 % increase
25 - Balaclava Road (Caernarfon)	3543	3752	6 % increase
26 - Bangor Street (Caernarfon)	1590	1608	1 % increase
27 - Campbell Road/Priestley Road (Caernarfon)	1686	1862	10 % increase
28 - B4366 (PROW Caernarfon Rhif 2 to Bethel Road Roundabout)	3606	2851	21 % decrease
29 - A487 (Ty Coch Farm/PROW Caernarfon Rhif 2 to Plas Menai Roundabout)	15495	8656	44 % decrease
30 - Un-named road (Bethel Road Roundabout to junction with un-named road at Crûg House)	5613	1407	75 % decrease

	2018 12 hours 'Do Minimum' AADT	2018 12 hours 'Yellow' AADT	% Increase / Decrease
31 - Un-named road (A4086 to Bethel Road Roundabout)	8222	3664	55 % decrease
32 - B4366 (Bethel Road Roundabout to West Bethel)	5196	3864	26 % decrease
33 - Un-named road (between Crûg House and Y Felinheli to B4366 near Bethel)	85	85	No Change
Un-named road (west Bethel to Ganol Street)	1063	1038	2 % decrease
B4366 (West Bethel to East Bethel)	3659	2354	36 % decrease
Ganol Street (un-named road to East Bethel)	296	296	No Change
Un-named road (Plas Menai Roundabout to junction with un-named road between Crûg House and Y Felinheli)	1920	512	73 % decrease

Active Travel (Wales) Act 2013 Active Travel Routes

Routes are considered 'Active Travel' routes under the Active Travel (Wales) Act 2013 if:

- the route is situated in a designated locality in the area, and
- the local authority considers that it is appropriate for it to be regarded as an active travel route.

Volume 2, Figure 12.1 (a – e) shows the designated locality of Caernarfon (which includes Caeathro). The Scheme does not enter the designated locality, skirting instead around its perimeter and travelling between Caernarfon and Caeathro. Therefore, there are no 'Active Travel' routes affected by the Scheme. Consultation with Gwynedd Council confirms this.

12.3.3 Outcomes of Consultation

Gwynedd County Council

During the development of the NMU Context Report and NMU Audit Report, Gwynedd County Council have been met with on a number of occasions. At these meetings design details relating to a number of proposed structures associated with

the Scheme and footpath crossings over/under it were discussed. They also focused on NMU provision at Goat Roundabout, Meifod Roundabout and Cibyn Roundabout. The potential for the scheme to provide NMU links between Bontnewydd, Caeathro and Cibyn were also discussed. In summary the Scheme complies with the requirements of the Gwynedd County Council where feasible.

Other user groups

The outcomes of consultation with other users groups are provided in the NMU Context Report and NMU Audit Report. In summary the Scheme complies with the requirements of the other users where feasible.

12.4 Predicted Environmental Effects

12.4.1 Construction impacts

Construction impacts are detailed in Volume 2, Figure 12.2 (a – d).

New severance

During construction the NMU routes listed in Table 12.4.1 would be affected. The magnitude and significance of impacts shown in Table 12.4.1 assume no mitigation is provided.

Table 12.4.1 – Construction impacts on NMU routes prior to mitigation

Receptor	Description of impact	Sensitivity	Magnitude	Significance	Comments / notes
Cycleway - NCN 8 (Goat Roundabout)	The existing cycleway would be severed by the Scheme at Ch0000 (Goat Roundabout). The cycleway would be stopped up either side of the Scheme.	Medium	Severe	Major - Moderate Adverse	8 cyclists per day (AADF; Department for Transport) at Bontnewydd and Plas Menai Roundabout. GC report approximately 33 cyclists and 66 pedestrians per day in a peak month.
Footpath - PRoW Llanwnda Rhif 19 (300 m north-north-east of Goat Roundabout)	The existing footpath would be severed by the Scheme at Ch0250. The footpath would be stopped up either side of the Scheme.	Medium	Severe	Major - Moderate Adverse	Gwynedd Council importance category of 3.

Receptor	Description of impact	Sensitivity	Magnitude	Significance	Comments / notes
Footpath - PRoW Llanwnda Rhif 10 (500 m east-north-east of Dinas)	The existing footpath would be severed by the Scheme at Ch1025. The footpath would be stopped up either side of the Scheme.	Medium	Severe	Major - Moderate Adverse	Gwynedd Council importance category of 3.
Cycleway - NCN 8 (350 m north-west of Bontnewydd WHR Station)	The existing cycleway would be severed by the Scheme at Ch2700. The cycleway would be stopped up either side of the Scheme.	Medium	Severe	Major - Moderate Adverse	8 cyclists per day (AADF; Department for Transport) at Bontnewydd and Plas Menai Roundabout. GC report approximately 33 cyclists and 66 pedestrians per day in a peak month.
Footpath - PRoW Bontnewydd Rhif 27 and PRoW Caernarfon Rhif 19 (350 m north of Bontnewydd WHR Station)	The existing footpaths are not severed by the Scheme directly. However, the road both join is severed by the Scheme at Ch2900. Therefore, due to the close proximity of these footpaths, a break in the NMU network would be caused.	Medium	Severe	Major - Moderate Adverse	Gwynedd Council importance categories of 4.

Receptor	Description of impact	Sensitivity	Magnitude	Significance	Comments / notes
Cycleway - Regional Cycleway 61 (1.35 km north-east of Bontnewydd WHR Station)	The existing cycleway would be severed by the Scheme at Ch4050. The cycleway would be stopped up either side of the Scheme.	Medium	Severe	Major - Moderate Adverse	Anecdotal evidence from GC that usage numbers range from 523-2801 during peak season (usually July).
Footpath - PRoW Bontnewydd Rhif 26 and PRoW Waunfawr Rhif 32 (625 m west of Caeathro)	The existing footpath would be severed by the Scheme at Ch4900. The footpath would be stopped up either side of the Scheme.	Medium	Severe	Major - Moderate Adverse	Gwynedd Council importance category of 3.
Footpath - PRoW Waunfawr Rhif 31 (625 m west of Caeathro)	The existing footpath would be severed by the Scheme at Ch5000. The footpath would be stopped up either side of the Scheme.	Medium	Severe	Major - Moderate Adverse	Gwynedd Council importance category of 2.
Footpath - PRoW Llanrug Rhif 36 (1 km north-east of the Cbyn Industrial Estate)	The existing footpath would be severed by the Scheme at Ch7050. The footpath would be stopped up either side of the Scheme.	Medium	Severe	Major - Moderate Adverse	Gwynedd Council importance category of 3.

Receptor	Description of impact	Sensitivity	Magnitude	Significance	Comments / notes
Shared use path - Proposed in the draft Joint LDP for Anglesey and Gwynedd (100 m west of existing B4366 Roundabout)	The proposed shared use path would be severed by the Scheme at Ch8400.	Low	Moderate	Minor Adverse	Sensitivity given as low as the shared use path is only proposed in the draft Joint LDP for Anglesey and Gwynedd.
Cycleway - NCN 8 (Plas Menai Roundabout)	The existing cycleway would be severed by the Scheme at Plas Menai Roundabout. The cycleway would be stopped up either side of the Scheme.	Medium	Severe	Major - Moderate Adverse	8 cyclists per day (AADF; Department for Transport) at Bontnewydd and Plas Menai Roundabout. GC report approximately 33 cyclists and 66 pedestrians per day in a peak month.

Relief from existing severance

There would be no relief from existing severance for NMUs in Caernarfon or Bontnewydd during the construction phase as the Scheme would not remove traffic from within the towns.

Views from the road

The majority of construction would occur outside the highway boundary and therefore would have a minimal impact on views from the existing roads and for the most part these would remain unchanged.

Construction impacts would have a significant impact on views from the road where the Scheme ties into the existing road network at, for example:

- Goat Roundabout
- Meifod Roundabout
- Cibyn Roundabout
- Plas Menai Roundabout
- Glanrhyd
- Ty'n Llan
- Llydiart Gwyn
- Waunfawr Road
- Llanberis Road Link
- Bethel Road
- Crug Lane

Driver stress

As there would be no traffic on the Scheme until completion, there would be no driver stress associated with construction of the majority of the Scheme.

Construction impacts would have a significant impact on driver stress where the Scheme ties into the existing road network at, for example:

- Goat Roundabout
- Meifod Roundabout
- Cibyn Roundabout
- Plas Menai Roundabout
- Glanrhyd
- Ty'n Llan
- Llydiart Gwyn
- Waunfawr Road
- Llanberis Road Link

- Bethel Road
- Crug Lane

It should be noted that the scheme proposals sever the existing Pwll Cefn Werthyd and Penybryn Road links causing some diversion disruption likely to be implemented prior to construction activities.

Assuming no mitigation, the works would cause considerable disruption to drivers and road safety. There would also be an effect of increased route uncertainty. The sensitivity is considered to be 'Medium' and magnitude of impact 'High.'

12.4.2 Operational impacts

Operational impacts are detailed in Volume 2, Figure 12.3 (a – d)

New severance

During the operational phase, without provision of mitigation measures, such as diversions or crossing points the impacts on NMU routes would be the same as shown in Table 12.4.1 for construction impacts.

Relief from existing severance and increased severance

Table 12.4.2 show the magnitude and significance of these impacts assuming no mitigation is provided.

Table 12.4.2 Operational impacts (relief and increase from/to severance) on NMU routes prior to mitigation - numbers in the Receptor column relate to numbers on Volume 2, Figure 12.3 (a – d)

Receptor	Description of impact	Sensitivity	Magnitude	Significance	Comments / notes
1 - A487 (Goat Roundabout to Llanwnda Roundabout)	Relief from existing severance - 86 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	Medium	Substantial	Major - Moderate Beneficial	
2 - A487 (Llanwnda Roundabout to ~200 metres north of Llanwnda)	Relief from existing severance - 82 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Substantial	Major Beneficial	Potential to be used by residents of Llanwnda

Receptor	Description of impact	Sensitivity	Magnitude	Significance	Comments / notes
3 - A487 (~200 metres north of Llanwnda to ~300 metres south of Bontnewydd)	Relief from existing severance - 76 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	Medium	Substantial	Major - Moderate Beneficial	
4 - A487 (~300 metres south of Bontnewydd to ~150 metres north of Bontnewydd)	Relief from existing severance - 71 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Substantial	Major Beneficial	Potential to be used by residents of Bontnewydd
5 - Lôn Caeathro (junction with A487 at Bontnewydd to junction with un-named road ~1 kilometre south-west from Caeathro)	Relief from existing severance - 76 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	Medium	Substantial	Major - Moderate Beneficial	
6 - A487 (~150 metres north of Bontnewydd to junction with Pen-y-bryn Road)	Relief from existing severance - 23 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	Medium	Slight	Minor Beneficial	

Receptor	Description of impact	Sensitivity	Magnitude	Significance	Comments / notes
7 - Un-named road (junction with Lôn Caeathro ~1 kilometre south-west of Caeathro to Caeathro)	Relief from existing severance - 8 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Slight	Moderate - Minor Beneficial	Potential to be used by residents of Caeathro
8 - Lôn Caeathro (junction with un-named road ~1 kilometre from Caeathro to Caeathro Roundabout)	Relief from existing severance - 85 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	Medium	Substantial	Major - Moderate Beneficial	
9 - Pen-y-bryn Road - Rhos Bach Lane (junction with A487 ~1.3 kilometres north of Bontnewydd to Lôn Caeathro)	No change to existing severance - No Change in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Neutral	Negligible	Potential to be used by users of Regional Cycleway 61
10 - A487 (junction with Pen-y-bryn Road to X Roundabout)	Relief from existing severance - 43 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Moderate	Major - Moderate Beneficial	Potential to be used by residents of Caernarfon

Receptor	Description of impact	Sensitivity	Magnitude	Significance	Comments / notes
11 - Pontrug Way (Caeathro Roundabout to junction with un-named road at Glan Gwna Hall)	Relief from existing severance - 74 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	Medium	Substantial	Major - Moderate Beneficial	
12 - A4085 (Caeathro to Caeathro Roundabout)	Relief from existing severance - 25 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	Medium	Slight	Minor Beneficial	
13 - A4085 (Caeathro to Pont Peblig)	Relief from existing severance - 19 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	Medium	Slight	Minor Beneficial	Potential to be used by residents of Caeathro and at its terminus at PRow Waunfawr Rhif 31. The operational diversion for PRow Waunfawr Rhif 31 and PRow Bontnewydd Rhif 26 runs alongside this route over the Scheme at S112E (Waunfawr Road A4085 Underbridge)

Receptor	Description of impact	Sensitivity	Magnitude	Significance	Comments / notes
14 - Un-named road/Pontrug Way (Caeathro to Pont-rug)	Relief from existing severance - 67 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	Medium	Substantial	Major - Moderate Beneficial	
15 - St Helen's Road (Caernarfon)	Relief from existing severance - 25 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Slight	Moderate - Minor Beneficial	Potential to be used by residents of Caernarfon and users of NCN 8
16 - A4085 (Pont Peblig to A487)	Relief from existing severance - 15 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Slight	Moderate - Minor Beneficial	Potential to be used by residents of Caernarfon
17 - Castle Hill (Caernarfon)	Relief from existing severance - 3 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Slight	Moderate - Minor Beneficial	Potential to be used by residents of Caernarfon and users of NCN 8

Receptor	Description of impact	Sensitivity	Magnitude	Significance	Comments / notes
18 - A487 (A4086 Roundabout to Ty Coch Farm/PROW Caernarfon Rhif 2)	Relief from existing severance - 42 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Moderate	Major - Moderate Beneficial	Potential to be used by residents of Caernarfon
19 - Pool Side (Caernarfon)	Increase to existing severance - 1 % increase in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Neutral	Negligible	Potential to be used by residents of Caernarfon
20 - A4086 (A4086 Roundabout to Llanberis Road Roundabout)	Relief from existing severance - 18 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Slight	Moderate - Minor Beneficial	Potential to be used by residents of Caernarfon
21 - Castle Ditch/Castle Square (Caernarfon)	Relief from existing severance - 2 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Slight	Moderate - Minor Beneficial	Potential to be used by residents of Caernarfon

Receptor	Description of impact	Sensitivity	Magnitude	Significance	Comments / notes
22 - B4366 (X Roundabout to PROW Caernarfon Rhif 2)	Relief from existing severance - 16 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Slight	Moderate - Minor Beneficial	Potential to be used by residents of Caernarfon and users of the proposed shared use path next to the B4366 (draft Joint LDP for Anglesey and Gwynedd)
23 - A4086 (Cibyn Industrial Estate to Llanberis Road Roundabout)	Relief from existing severance - 15 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Slight	Moderate - Minor Beneficial	Potential to be used by residents of Caernarfon, especially around the Cibyn Industrial estate
24 - A4086 (Pont-rug to Cibyn Industrial Estate)	Increase to existing severance - 19 % increase in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Neutral	Negligible	Potential to be used by residents of Caernarfon, especially around the Cibyn Industrial estate
25 - Balaclava Road (Caernarfon)	Increase to existing severance - 6 % increase in traffic (2018 AADT 12 hour) from 'Do	High	Neutral	Negligible	Potential to be used by residents of Caernarfon and users of NCN 8

Receptor	Description of impact	Sensitivity	Magnitude	Significance	Comments / notes
	Minimum' to 'Yellow' (the Scheme)				
26 - Bangor Street (Caernarfon)	Increase to existing severance - 1 % increase in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Neutral	Negligible	Potential to be used by residents of Caernarfon
27 - Campbell Road/Priestley Road (Caernarfon)	Increase to existing severance - 10 % increase in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Neutral	Negligible	Potential to be used by residents of Caernarfon
28 - B4366 (PROW Caernarfon Rhif 2 to Bethel Road Roundabout)	Relief from existing severance - 21 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	Medium	Slight	Minor Beneficial	Potential to be used by NMU along the proposed shared use path next to the B4366 (draft Joint LDP for Anglesey and Gwynedd)
29 - A487 (Ty Coch Farm/PROW Caernarfon Rhif 2 to Plas Menai Roundabout)	Relief from existing severance - 44 % decrease in traffic (2018 AADT 12 hour) from 'Do	Medium	Moderate	Moderate - Minor Beneficial	

Receptor	Description of impact	Sensitivity	Magnitude	Significance	Comments / notes
	Minimum' to 'Yellow' (the Scheme)				
30 - Un-named road (Bethel Road Roundabout to junction with un-named road at Crûg House)	Relief from existing severance - 75 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	Medium	Substantial	Major - Moderate Beneficial	
31 - Un-named road (A4086 to Bethel Road Roundabout)	Relief from existing severance - 55 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	Medium	Moderate	Moderate - Minor Beneficial	
32 - B4366 (Bethel Road Roundabout to West Bethel)	Relief from existing severance - 26 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	Medium	Slight	Minor Beneficial	Potential to be used by NMU along the proposed shared use path next to the B4366 (draft Joint LDP for Anglesey and Gwynedd)
33 - Un-named road (between Crûg House and Y Felinheli to B4366 near Bethel)	No change to existing severance - No Change in traffic (2018 AADT 12 hour) from 'Do	Medium	Neutral	Negligible	

Receptor	Description of impact	Sensitivity	Magnitude	Significance	Comments / notes
	Minimum' to 'Yellow' (the Scheme)				
Un-named road (west Bethel to Ganol Street)	Relief from existing severance - 2 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Slight	Moderate - Minor Beneficial	Potential to be used by residents of Bethel
B4366 (West Bethel to East Bethel)	Relief from existing severance - 36 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Moderate	Major - Moderate Beneficial	Potential to be used by residents of Bethel
Ganol Street (un-named road to East Bethel)	No change to existing severance - No Change in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Neutral	Negligible	Potential to be used by residents of Bethel
Un-named road (Plas Menai Roundabout to junction with un-named road between Crûg	Relief from existing severance - 73 % decrease in traffic (2018 AADT 12 hour) from 'Do	Medium	Substantial	Major - Moderate Beneficial	Potential to be used by residents of Bethel accessing NCN 8 at Plas Menai Roundabout

Receptor	Description of impact	Sensitivity	Magnitude	Significance	Comments / notes
House and Y Felinheli)	Minimum' to 'Yellow' (the Scheme)				

Views from the road

The following outlines the assessment of the views from the road with the proposed planting as shown on the Landscape Mitigation Measures Volume 2, Figure 7.11.

Goat Roundabout (Chainage 0) - Chainage 600

The Scheme would leave the existing elevated Goat Roundabout on an embankment, up to 7m high. Continuous woodland planting on the western faces would restrict outward views, whilst more fragmented planting on the eastern face would allow views down to the enclosed fields alongside Lon Eifion. On approaching the roundabout from the north there would be long distance views to the peaks of Snowdonia.

Drivers' views of surrounding landscape: Intermittent View

Chainage 600 - Chainage 1100

The Scheme would pass through this area in a cutting, up to 10m deep, which would result in views being entirely restricted to the road corridor. An overbridge would provide some visual interest as it crosses the cutting, and the slopes would be in grassland and scattered trees.

Drivers' views of surrounding landscape: No View

Chainage 1100 - Chainage 1800

An embankment of varying height between 1 and 6m through this section, with a mixture of woodland planted and open slopes, would allow some limited views to the landscape around.

Drivers' views of surrounding landscape: Intermittent View

Chainage 1800 - Chainage 2050 (Gwyrfai Viaduct)

The Gwyrfai Viaduct would provide an elevated view over the floodplain, with only the structure barrier creating a visual obstruction. The impact of this view would be heightened by being experienced between two more enclosed sections, although the structure would be only around 6m above the adjacent landscape.

Drivers' views of surrounding landscape: Open View

Chainage 2050 - Chainage 3000

Through this section the Scheme would be on embankment, between 1 and 10m high, but densely planted on both sides in woodland. Therefore, for much of the year the views would be highly enclosed, with only glimpsed views in winter months. An overbridge at Chainage 2900 provides some interest viewed along the road corridor.

Drivers' views of surrounding landscape: Restricted View

Chainage 3000 - Meifod Roundabout (Chainage 3550)

The Scheme form would vary between a low embankment and cutting in this section, with the boundaries marked by new hedgerows and retained streamside vegetation.

The views out would therefore be in the gaps where vegetation allows, to both east and west. At the Meifod Roundabout the views would be more open to the rising ground to the east, being enclosed in other directions by new and retained vegetation.

Drivers' views of surrounding landscape: Intermittent View

Chainage 3550 - Chainage 4000

Here the Scheme would be on embankment, up to 6m high, but with densely planted slopes and retained adjacent vegetation. Consequently, there would be little in the way of views outside the road corridor.

Drivers' views of surrounding landscape: Restricted View

Chainage 4000 - Chainage 4800

As the Scheme skirts the eastern side of the Caernarfon Quarry it would be on a small embankment of around 1.5m high, with a mixture of woodland blocks, grassed slopes, hedgerow boundaries and retained vegetation. The new planting would be mainly on the eastern slopes with the western faces being largely grass combined with hedgerow boundaries. Consequently, outward views would be intermittent and primarily to the west and north.

Drivers' views of surrounding landscape: Intermittent View

Chainage 4800 - Chainage 5000

Through this section the Scheme would pass into a 5m deep cutting with views out being entirely limited by the landform and its depth, although the slopes would be open grassland. The edge of the cutting would be bounded by a new hedgerow.

Drivers' views of surrounding landscape: No View

Chainage 5000 - Chainage 5450

From the cutting the Scheme would transition to an embankment which would be up to 8m high. Views out from the embankment would be restricted by continuous woodland planting, although in the winter months there would be some filtered views of the wider landscape. There would be a small glimpsed outward view where the scheme transitions from cutting to embankment, but this would be so fleeting as to be negligible.

Drivers' views of surrounding landscape: Restricted View

Chainage 5450 - Chainage 5600 (Seiont Viaduct)

The Scheme would emerge from the wooded embankment onto an open viaduct structure some 20m above the valley floor. This would provide dramatically contrasting open views out from the Scheme, only restricted by the parapet. However, these would focus on the valley sides and the wider landscape, rather than the holiday park in the valley floor.

Drivers' views of surrounding landscape: Open View

Chainage 5600 – Cibyn Roundabout (Chainage 6500)

Having crossed the Seiont valley the Scheme would skirt around the eastern edge of the Cibyn Industrial Estate. Here it would be largely in cutting, up to 3m deep, with a mix of grassed slopes, woodland blocks, and all bounded by new hedgerows.

Therefore, the outward views would be restricted to the road corridor and to the higher adjacent industrial buildings to the west. Cibyn Roundabout would slightly elevated, but surrounded by a combination of woodland planting and hedgerows.

Drivers' views of surrounding landscape: Restricted View

Chainage 6500 – Chainage 8100

Through this long section the Scheme would be either at-grade or on a small embankment, with limited associated planting. The small slopes and highway verges would be mainly grassed and bounded by a new hedgerow. In places the embankment position would allow views over the hedgerow to the wider plateau landscape, which gently rises to the east and west.

Drivers' views of surrounding landscape: Intermittent View

Chainage 8100 – Chainage 8900 (main line)

This section of the Scheme includes both the main line and realigned side roads. The main line Scheme would vary between 3m high embankments and 5m deep cuttings, with a mix of open grass slopes, small woodland blocks and hedgerows. The planting areas would be associated with the embankment section whilst the cuttings would be largely unplanted with only the boundary hedgerow. Outward views would therefore be restricted by both the landform profile and the embankment planting.

Crossing this section of the Scheme at Chainage 8430 the Bethel Road Overbridge would provide some visual interest within the road corridor.

Drivers' views of surrounding landscape: Restricted View

Realigned Crug Lane unclassified road and Bethel Road Roundabout

This realigned side road would be in cuttings at its northern and southern ends, up to 3m deep, with the central section and the roundabout being on embankment, up to 8m high above the adjacent existing landscape. The highest embankment areas and the roundabout would be enclosed by woodland planting on the slopes, therefore limiting outward views. However, beyond the roundabout approaches the eastern embankment faces would be open grassland with the hedgerow at its base, providing open views across the landscape to the east. As the side road moves into the cuttings outward views would be completely restricted.

Drivers' views of surrounding landscape: Intermittent View

Chainage 8900 – Chainage 9600

The Scheme would enter a deep cutting in this section, some 19m deep at its maximum, which would clearly prevent any views out of the road corridor. However, the cutting slopes will be in open grassland, leading into extensive exposed rock providing a dramatic and interesting road context.

Drivers' views of surrounding landscape: No View

Chainage 9600 – Plas Menai Roundabout (Chainage 9750)

As the Scheme would exit the cutting on approach to the roundabout wider views would open up across the junction and along the existing A487 corridor, although this is itself enclosed by the landform and adjacent vegetation.

Drivers' views of surrounding landscape: Open view

Driver stress

The maximum flow units (see explanation beneath Table 12.2.7) predicted during peak hour flows for at least one kilometre of the Scheme is 1,319 (2035 PM Peak Hour). Based on DMRB guidance (Table 12.2.7) for Single Carriageway Roads, the Scheme is predicted to have a magnitude of impact of 'High' on driver stress levels as the average speeds would be in excess of 70 kph.

The main operational impact of the Scheme will be to reduce through traffic in communities bypassed. This will be most evident in the communities of Llanwnda & Bontnewydd where upon opening through traffic is predicted to reduce to around 20% of the current flow. There will also be traffic flow reductions in the region of 30% to 40% on the rural links that make up the existing 'unofficial' bypass. The new road will also relieve congestion in Caernarfon and its immediate surroundings but this is likely to be more evident in reduced junction delay during peak periods than overall traffic volumes.

On balance it is assessed that the Scheme's impact on driver stress prior to mitigation would have a magnitude of 'Medium Beneficial'. With a sensitivity of 'Medium', the significance would be 'Moderate – Minor Beneficial'.

12.5 Proposed Mitigation

12.5.1 Construction mitigation

Construction mitigation is detailed in Volume 2, Figure 12.2 (a – d).

New severance

NCN 8 would remain open during construction. Where it crosses the Scheme's main access road at the Goat Roundabout there would be signage and guardrails which would advise cyclists to dismount and to be vigilant of the site access crossing. These measures would be in place throughout construction (February 2018 – July 2020).

A temporary footpath would be put in place to divert PRow Llanwnda Rhif 19 along the boundary of the Scheme's temporary land take and away from the main alignment works. This would then link back on to Glanrhyd Road, north-east of the original route. The temporary footpath would be signed accordingly and provision would be made for the safety of walkers where required (e.g. surfacing and fencing). This temporary diversion would be in place till approximately autumn 2019.

A temporary crossing following the line of the new alignment would be put in place at approximately Ch1100 in order for PRow Llanwnda Rhif 10 to cross the Scheme. There would be signage and barriers/fencing erected as appropriate in order to allow walkers to safe passage through the works area. Signage warning site traffic about the crossing would be erected.

NCN 8 would cross the Scheme through S108 (Pont Cefnwerthyd) adjacent to the WHLR and therefore no temporary diversion of the path would be required. Provision would be made to protect users of the path with gates and signage in order that they are safeguarded throughout the construction of S108.

During construction no mitigation would be provided for PRow Bontnewydd Rhif 27 and PRow Caernarfon Rhif 19 as the road which is severed and that both PRow Bontnewydd Rhif 27 and PRow Caernarfon Rhif 19 join does not form a part of a PRow.

During construction a temporary crossing would be provided in order to maintain access between PRow Bontnewydd Rhif 27 and PRow Caernarfon Rhif 19.

Regional Cycleway 61 would remain in place on Rhos Bach Lane, crossing the Scheme via a temporary plant crossing until construction of S111 (Pont Bryn Mafon) to the south is finished. Once S111 is completed and ready for operation (during autumn 2019), NCN 61 would be permanently routed over it. There may be temporary periods of closure during construction.

PRow Bontnewydd Rhif 26 would cross the Scheme at Ch5000 via a temporary crossing and join its existing alignment. Signage and fencing would be put in place to safeguard users of the footpath. Signage warning site traffic about the crossing would be erected. The temporary diversion would be in place from February 2018 to summer 2019.

PRow Waunfawr Rhif 31 would cross the Scheme at Ch5000 via temporary crossing and join its existing alignment. Signage and fencing would be put in place to safeguard users of the footpath. Signage warning site traffic about the crossing would be erected. The temporary diversion would be in place from February 2018 to summer 2019.

PRow Llanrug Rhif 36 would be temporarily diverted across the Scheme via a temporary crossing Ch7000. Signage, fencing and barriers would be put in place to safeguard users of the footpath. Signage warning site traffic about the crossing would be erected. The temporary diversion would be in place from February 2018 to summer 2019.

Bethel Road would remain open during construction of the new overbridge and the proposed offline roundabout after which the existing road would be linked to the new structures. Traffic management would be in place to safeguard any NMUs using the proposed (in the draft Joint LDP for Anglesey and Gwynedd) shared use path throughout the construction phase which would include controlled temporary crossing locations.

NCN 8 would be temporarily diverted during the construction of Plas Menai Roundabout and associated side road junctions – a temporary cycleway would be provided in order to divert cyclists around the construction works. The temporary diversion would be in effect from summer 2019 to summer 2020.

No mitigation is proposed with regards to relief from existing severance during the construction phase as no impacts have been identified.

Views from the road

There is no mitigation proposed in relation to drivers' views from the during the construction phase.

Driver stress

The construction methodology is to construct as much as possible of the scheme off-line including the main bypass links, intermediate roundabouts and major structures. These off-line features will be serviced by plant and materials via trace haul roads with temporary bridges to maintain continuity.

The Construction Traffic Management Plan will include details of all impacts on the existing road network including local temporary traffic management and wider site access routes.

12.5.2 Operational mitigation

Operational mitigation is detailed in Volume 2, Figure 12.3 (a – d)

New severance

Following completion of construction, the new rights of way network would be fully implemented as shown in Volume 2, Figure 12.3 a – d.

At the Goat Roundabout, NCN 8 cycleway would be diverted south around the eastern side of Goat Roundabout, crossing both the existing A487 arms (via an at-grade uncontrolled crossing) to join its existing alignment.

North of Goat Roundabout, at Ch0250, PRoW Llanwnda Rhif 19 would be diverted north along the eastern boundary of the Scheme for ~200 m to Glanrhyd Road and then west for ~80 m, crossing the Scheme via a footway through S101A (Pont Parc Underpass), to join its existing alignment. The portion of PRoW Llanwnda Rhif 19 running along the western boundary of the Scheme would cease to exist and access to it from Glanrhyd Road would be removed.

At Ch01025, where PRoW Llanwnda Rhif 10 currently leaves Ty'n Llan Road, it would instead be diverted west along Ty'n Llan Road for ~250 m, crossing the Scheme over S103 (Ty'n Llan Overbridge). It would then be routed north along the western boundary of the Scheme for ~200 m to join its existing alignment. The portion of PRoW Llanwnda Rhif 10 running northwest from Ty'n Llan Road would cease to exist and access to it from Ty'n Llan would be removed.

At Ch2700, NCN 8 cycleway's alignment would remain the same, crossing the Scheme adjacent to the Welsh Highland Railway through S108 via a cycleway (Pont Cefnwerthyd).

The existing road which PRoW Bontnewydd Rhif 27 and PRoW Caernarfon Rhif 19 join would be stopped-up either side of the Scheme. S109 (Pont Ceriw NMU Overbridge) would provide access over the Scheme in order to connect PRoW Bontnewydd Rhif 27 and PRoW Caernarfon Rhif 19 to one another.

~250 m southeast of Regional Cycleway 61 existing tie-in to Penybryn Road it would be diverted west for ~200 m and across the Scheme through S111 (Pont Bryn Mafon)

at Ch3950. It would then be routed north for ~170 m to join its existing alignment ~35 m west of its existing tie-in with Penybryn Road.

~300 m after leaving Penrhos, PRow Bontnewydd Rhif 26 (previously PRow Waunfawr Rhif 32) would be diverted north along the eastern boundary of the Scheme for ~440 m to the A4085. It would then be routed northwest for ~200 m alongside the A4085 via a footway, crossing the Scheme through S112E (Waunfawr Road A4085 Underbridge) to reach its existing northern terminus. The portions of PRow Bontnewydd Rhif 26 and PRow Waunfawr Rhif 32 remaining to the west of the Scheme would be stopped-up at the Scheme's boundary.

~370 m after leaving Penrhos, PRow Waunfawr Rhif 31 would join PRow Bontnewydd Rhif 26's diversion. It would be routed north along the eastern boundary of the Scheme for ~300 m to the A4085. It would then be routed northwest for ~200 m alongside the A4085 via a footway, crossing the Scheme through S112E (Waunfawr Road A4085 Underbridge) to reach its existing northern terminus. The portion of PRow Waunfawr Rhif 31 remaining to the west of the Scheme would be stopped-up at the Scheme's boundary.

~250 m after leaving the A4086 near to Kent, PRow Llanrug Rhif 36 would be diverted north-east along the Scheme's eastern boundary for ~150 m. It would cross the Scheme through S113A and then travel northwest for ~200 m to join its existing alignment. The portion of PRow Llanrug Rhif 36 to the west of the Scheme and south of Tyddyn Bistle would cease to exist.

The alignment of the proposed shared use path alongside the B4366 (Proposed in the draft Joint LDP for Anglesey and Gwynedd) would remain largely the same. The B4366 Roundabout would be moved east ~150 m to accommodate the B4366 crossing the Scheme over S115 (Bethel Road Overbridge). As the shared use path alongside the B4366 is currently only a proposal there is no cyclist/pedestrian crossing proposed at the new B4366 Roundabout. However, provision has been made on S115 by means of a verge in order to accommodate the shared use path in the future.

At Plas Menai Roundabout, NCN 8 cycleway's alignment would remain largely the same. As a result of the road leading to Plas Menai National Outdoor Centre being realigned off Plas Menai Roundabout, NCN 8 cycleway would cross it (via an at-grade uncontrolled crossing) before it joins Y Felinheli. The net result of this is NCN 8's crossing being moved further from Plas Menai Roundabout.

Relief from existing severance and increase in severance

No mitigation is proposed in relation to relief from existing severance during the operational phase as impacts are mainly beneficial.

Views from the road

The proposed operational mitigation measures include landscape planting in the form of screen planting, planting for ecological and landscape integration, planting on embankments and cuttings and earth modelling works.

The landscape mitigation planting is proposed to provide screening of the road from adjacent residential areas and to help soften engineering embankments and new roundabouts. The planting is proposed to soften the edges of existing woodland areas, replace planting removed from the Scheme and provide connectivity with

existing planting and hedgerows and reinforce the existing landscape character of the area.

Driver stress

The Scheme has been designed to minimise driver stress and therefore, there is no additional mitigation proposed.

The Scheme would also relieve congestion in Caernarfon and its immediate surroundings but this is likely to be more evident in reduced junction delay during peak periods than overall traffic volumes. Traffic using the Scheme itself would be given increased opportunity to achieve mandated speeds from enhanced link standards and reduced junction frequency combined with the overtaking opportunities provided by the 2+1 standard. Scheme traffic would also have additional lay-by provision and improved driver views over that offered by the current links.

Although the Scheme proposals would increase the length and number of highway assets, sharing of traffic over the enlarged network would reduce pavement attrition rate and overall congestion when maintenance activities are eventually required. This is particularly true of the 2+1 Scheme pavement which increases the ability to accommodate through traffic during maintenance activities.

Stress reduction measures include:

- Improved journey times and journey time reliability
- Improved and consistent link standards for safer travel, especially bypass lane widths, visibility and hard shoulder provision.
- Reduced junction frequency and type variability for improved junction safety
- Increased overtaking opportunities reducing driver frustration/risk taking
- Improved separation of local and through traffic for better correlation of vehicle types/speeds
- Additional lay-by provision to relieve tiredness
- Clear and consistent signage giving driver information
- Improved driver experience with views and sympathetic planting
- Reduced traffic volumes in bypassed communities reducing hazards
- Improved junction delay and performance stability in urban areas from reduced demand
- Reduced future maintenance frequency and consequent road user delay especially on bypass links.

12.6 Residual Environmental Effects (following mitigation)

12.6.1 Construction impacts

Construction impacts and mitigation are detailed in Volume 2, Figure 12.2 (a – d).

New severance

Table 12.6.1 – Construction impacts on NMU routes following mitigation

Receptor	Description of impact	Magnitude (prior to mitigation)	Significance (prior to mitigation)	Mitigation	Magnitude (following mitigation)	Significance (following mitigation)	Comments / notes
Cycleway - NCN 8 (Goat Roundabout)	The existing cycleway would be severed by the Scheme at Ch0000 (Goat Roundabout). The cycleway would be stopped up either side of the Scheme.	Severe	Major - Moderate Adverse	NCN 8 would remain open during construction. Where it crosses the Scheme's main access road at the Goat Roundabout there would be signage and guardrails which would advise cyclists to dismount and to be vigilant of the site access crossing. These measures would be in place throughout construction (February 2019 – July 2020).	Slight	Minor Adverse	Amenity of route reduced during construction due to exposure to noise and dust and visual impact.
Footpath - PRoW Llanwnda	The existing footpath would be severed by the	Severe	Major - Moderate Adverse	A temporary footpath would be put in place to divert PRoW Llanwnda	Slight	Minor Adverse	Amenity of route reduced during

Receptor	Description of impact	Magnitude (prior to mitigation)	Significance (prior to mitigation)	Mitigation	Magnitude (following mitigation)	Significance (following mitigation)	Comments / notes
Rhif 19 (300 m north-north-east of Goat Roundabout)	Scheme at Ch0250. The footpath would be stopped up either side of the Scheme.			Rhif 19 along the boundary of the Scheme's temporary land take and away from the main alignment works. This would then link back on to Glanrhyd Road, north-east of the original route. The temporary footpath would be signed accordingly and provision would be made for the safety of walkers where required (e.g. surfacing and fencing). This temporary diversion would be in place until approximately autumn 2019.			construction due to exposure to noise and dust and visual impact.
Footpath - PRoW Llanwnda Rhif 10 (500 m east-north-east of Dinas)	The existing footpath would be severed by the Scheme at Ch1025. The footpath would be stopped up either side of the Scheme.	Severe	Major - Moderate Adverse	A temporary crossing following the line of the new alignment would be put in place at approx. Ch1100 in order for PRoW Llanwnda Rhif 10 to cross the Scheme. There would be signage and barriers/fencing	Slight	Minor Adverse	Amenity of route reduced during construction due to exposure to noise and dust and visual impact.

Receptor	Description of impact	Magnitude (prior to mitigation)	Significance (prior to mitigation)	Mitigation	Magnitude (following mitigation)	Significance (following mitigation)	Comments / notes
				erected as appropriate in order to allow walkers to safe passage through the works area. Signage warning site traffic about the crossing would be erected.			
Cycleway - NCN 8 (350 m north-west of Bontnewydd WHR Station)	The existing cycleway would be severed by the Scheme at Ch2700. The cycleway would be stopped up either side of the Scheme.	Severe	Major - Moderate Adverse	NCN 8 would cross the Scheme through S108 (Pont Cefnwerthyd) adjacent to the WHLR and therefore no temporary diversion of the path would be required. Provision would be made to protect users of the path with gates and signage in order that they are safeguarded throughout the construction of S108. There may be temporary periods of closure during construction.	Slight	Minor Adverse	Amenity of route reduced during construction due to exposure to noise and dust and visual impact.
Footpath - PRow Bontnewydd Rhif 27 and	The existing footpaths are not severed by the Scheme directly.	Severe	Major - Moderate Adverse	During construction a temporary crossing will be provided in order to maintain access	Severe	Major - Moderate Adverse	Amenity of route reduced during construction

Receptor	Description of impact	Magnitude (prior to mitigation)	Significance (prior to mitigation)	Mitigation	Magnitude (following mitigation)	Significance (following mitigation)	Comments / notes
PRoW Caernarfon Rhif 19 (350 m north of Bontnewydd WHR Station)	However, the road both join is severed by the Scheme at Ch2900. Therefore, due to the close proximity of these footpaths, a break in the NMU network would be caused.			between PRoW Bontnewydd Rhif 27 and PRoW Caernarfon Rhif 19.			due to exposure to noise and dust and visual impact.
Cycleway - Regional Cycleway 61 (1.35 km north-east of Bontnewydd WHR Station)	The existing cycleway would be severed by the Scheme at Ch4050. The cycleway would be stopped up either side of the Scheme.	Severe	Major - Moderate Adverse	Regional Cycleway 61 would remain in place on Rhos Bach Lane, crossing the Scheme via a temporary plant crossing until construction of S111 (Pont Bryn Mafon) to the south is finished. Once S111 is completed and ready for operation (during autumn 2019), Regional Cycleway 61 would be permanently routed over it.	Slight	Minor Adverse	Amenity of route reduced during construction due to exposure to noise and dust and visual impact.
Footpath - PRoW Bontnewydd Rhif 26 and	The existing footpath would be severed by the Scheme at Ch4900.	Severe	Major - Moderate Adverse	PRoW Bontnewydd Rhif 26 would cross the Scheme at Ch5000 via a temporary crossing and	Slight	Minor Adverse	Amenity of route reduced during construction

Receptor	Description of impact	Magnitude (prior to mitigation)	Significance (prior to mitigation)	Mitigation	Magnitude (following mitigation)	Significance (following mitigation)	Comments / notes
PRoW Waunfawr Rhif 32 (625 m west of Caeathro)	The footpath would be stopped up either side of the Scheme.			join its existing alignment. Signage and fencing would be put in place to safeguard users of the footpath. Signage warning site traffic about the crossing would be erected. The temporary diversion would be in place from February 2018 to summer 2019.			due to exposure to noise and dust and visual impact.
Footpath - PRoW Waunfawr Rhif 31 (625 m west of Caeathro)	The existing footpath would be severed by the Scheme at Ch5000. The footpath would be stopped up either side of the Scheme.	Severe	Major - Moderate Adverse	PRoW Waunfawr Rhif 31 would cross the Scheme at Ch5000 via temporary crossing and join its existing alignment. Signage and fencing would be put in place to safeguard users of the footpath. Signage warning site traffic about the crossing would be erected. The temporary diversion would be in place from February 2018 to summer 2019.	Slight	Minor Adverse	Amenity of route reduced during construction due to exposure to noise and dust and visual impact.
Footpath - PRoW Llanrug Rhif	The existing footpath would be severed by the	Severe	Major - Moderate Adverse	PRoW Llanrug Rhif 36 would be temporarily diverted across the	Slight	Minor Adverse	Amenity of route reduced during

Receptor	Description of impact	Magnitude (prior to mitigation)	Significance (prior to mitigation)	Mitigation	Magnitude (following mitigation)	Significance (following mitigation)	Comments / notes
36 (1 km north-east of the Cibyn Industrial Estate)	Scheme at Ch7050. The footpath would be stopped up either side of the Scheme.			Scheme via a temporary crossing Ch7000. Signage, fencing and barriers would be put in place to safeguard users of the footpath. Signage warning site traffic about the crossing would be erected. The temporary diversion would be in place from February 2018 to December 2019.			construction due to exposure to noise and dust and visual impact.
Shared use path - Proposed in the draft Joint LDP for Anglesey and Gwynedd (100 m west of existing B4366 Roundabout)	The proposed shared use path would be severed by the Scheme at Ch8400.	Moderate	Minor Adverse	Bethel Road will remain open during construction of the new overbridge and the proposed offline roundabout after which the existing road will be linked to the new structures. Traffic management will be in place to safeguard any NMUs throughout the construction phase which will include controlled temporary crossing locations.	Neutral	Negligible	Magnitude considered 'Neutral' due to current status of this NMU route. Amenity of route reduced during construction due to exposure to noise and dust and visual impact

Receptor	Description of impact	Magnitude (prior to mitigation)	Significance (prior to mitigation)	Mitigation	Magnitude (following mitigation)	Significance (following mitigation)	Comments / notes
Cycleway - NCN 8 (Plas Menai Roundabout)	The existing cycleway would be severed by the Scheme at Plas Menai Roundabout. The cycleway would be stopped up either side of the Scheme.	Severe	Major - Moderate Adverse	NCN 8 will be temporarily diverted during the construction of Plas Menai Roundabout and associated side road junctions – a temporary cycleway would be provided in order to divert cyclists around the construction works. The temporary diversion would be in effect from summer 2019 to summer 2020.	Slight	Minor Adverse	Amenity of route reduced during construction due to exposure to noise and dust and visual impact

Relief from existing severance

As no construction mitigation is proposed in relation to relief from existing severance the impacts are as described previously in Section 12.4.1.

Views from the road

As no construction mitigation is proposed in relation to views from the road the impacts are as described previously in Section 12.4.1.

Driver stress

The majority of impact on driver stress during construction would be mitigated for as detailed in Section 12.4.1. However, short periods of more extensive disruption might be expected where the Scheme ties into the existing road network at, for example:

- Goat Roundabout
- Meifod Roundabout
- Cibyn Roundabout
- Plas Menai Roundabout
- Glanrhyd
- Ty'n Llan
- Llydiart Gwyn
- Waunfawr Road
- Llanberis Road Link
- Bethel Road
- Crug Lane

Therefore, on balance the magnitude of impact on driver stress following mitigation is considered to be 'Moderate' with the significance of impact considered to be 'Minor Adverse'.

12.6.2 Operational impacts

Operational impacts and mitigation are detailed in Volume 2, Figure 12.3 (a – d).

New severance

Table 12.6.2 Operational impacts on NMU routes following mitigation

Receptor	Description of impact	Magnitude (prior to mitigation)	Significance (prior to mitigation)	Mitigation	Magnitude (following mitigation)	Significance (following mitigation)	Comments / notes
Cycleway - NCN 8 (Goat Roundabout)	The existing cycleway would be severed by the Scheme at Ch0000 (Goat Roundabout). The cycleway would be stopped up either side of the Scheme.	Severe	Major - Moderate Adverse	NCN 8 would be diverted south around the eastern side of Goat Roundabout, crossing both the existing A487 arms (via an at-grade uncontrolled crossing) to join its existing alignment.	Slight	Minor Adverse	During operation, change in amenity value would be negligible due to NCN 8's existing proximity to existing roads (including the A487)
Footpath - PRoW Llanwnda Rhif 19 (300 m north-north-east of Goat Roundabout)	The existing footpath would be severed by the Scheme at Ch0250. The footpath	Severe	Major - Moderate Adverse	~275 m after leaving the existing A487, PRoW Llanwnda Rhif 19 would be diverted north along the	Slight	Minor Adverse	During operation amenity would be reduced due to exposure to noise,

	would be stopped up either side of the Scheme.			eastern boundary of the Scheme for ~200 m to Glanrhyd Road and then west for ~80 m, crossing the Scheme via a footway through S101A (Pont Parc Underpass), to join its existing alignment. The portion of PRow Llanwnda Rhif 19 running along the western boundary of the Scheme would cease to exist and access to it from Glanrhyd Road would be removed.			increased air pollution and visual impact from the Scheme.
Footpath - PRow Llanwnda Rhif 10 (500 m east-north-east of Dinas)	The existing footpath would be severed by the Scheme at Ch1025. The footpath would be	Severe	Major - Moderate Adverse	Where PRow Llanwnda Rhif 10 currently leaves Ty'n Llan Road it would instead be diverted west along Ty'n Llan	Moderate	Moderate - Minor Adverse	During operation amenity would be reduced due to exposure to noise, increased air

	stopped up either side of the Scheme.			Road for ~250 m, crossing the Scheme over S103 (Ty'n Llan Overbridge). It would then be routed north along the western boundary of the Scheme for ~200 m to join its existing alignment. The portion of PRow Llanwnda Rhif 10 running north-west from Ty'n Llan Road would cease to exist and access to it from Ty'n Llan Road would be removed.			pollution and visual impact from the Scheme. A reduction in traffic along Ty'n Llan Road of ~45 % (AADT 12 hour 2018) is anticipated which will result in an increase in amenity value. On balance, the impact on amenity value is considered to be neutral.
Cycleway - NCN 8 (350 m north-west of Bontnewydd WHR Station)	The existing cycleway would be severed by the Scheme at Ch2700. The cycleway would be stopped up	Severe	Major - Moderate Adverse	NCN 8's alignment would remain the same with it crossing the Scheme through S108 via a cycleway (Pont Cefnwerthyd)	Slight	Minor Adverse	During operation amenity would be reduced due to exposure to noise, increased air

	either side of the Scheme.						pollution and visual impact.
Footpath - PRow Bontnewydd Rhif 27 and PRow Caernarfon Rhif 19 (350 m north of Bontnewydd WHR Station)	The existing footpaths are not severed by the Scheme directly. However, the road both join is severed by the Scheme at Ch2900. Therefore, due to the close proximity of these footpaths, a break in the NMU network would be caused.	Severe	Major - Moderate Adverse	The existing road which PRow Bontnewydd Rhif 27 and PRow Caernarfon Rhif 19 join will be stopped-up either side of the Scheme. S109 (Pont Ceriw NMU Overbridge) will provide access over the Scheme in order to connect PRow Bontnewydd Rhif 27 and PRow Caernarfon Rhif 19 to one another.	Slight Beneficial	Minor Beneficial	
Cycleway - Regional Cycleway 61 (1.35 km north-east of Bontnewydd WHR Station)	The existing cycleway would be severed by the Scheme at Ch4050. The cycleway would be stopped up	Severe	Major - Moderate Adverse	~250 m south-east of Regional Cycleway 61's existing tie-in to Penybryn Road it would be diverted west for ~200 m, across the Scheme	Moderate	Moderate - Minor Adverse	During operation amenity would be reduced due to exposure to noise, increased air

	either side of the Scheme.			through S111 (Pont Bryn Mafon) at Ch3950. It would be routed north for ~170 m to join its existing alignment ~35 m west of its existing tie-in with Penybryn Road.			pollution and visual impact.
Footpath - PRoW Bontnewydd Rhif 26 and PRoW Waunfawr Rhif 32 (625 m west of Caeathro)	The existing footpath would be severed by the Scheme at Ch4900. The footpath would be stopped up either side of the Scheme.	Severe	Major - Moderate Adverse	~300 m after leaving Penrhos, PRoW Bontnewydd Rhif 26 (previously PRoW Waunfawr Rhif 32) would be diverted north along the eastern boundary of the Scheme for ~440 m to the A4085. It would then be routed north-west for ~200 m alongside the A4085 via a footway, crossing the	Slight	Minor Adverse	During operation amenity would be reduced due to exposure to noise, increased air pollution and visual impact from both the Scheme and its route alongside the A4085. It is anticipated that there will be ~2300 vehicles using the A4085 per

				<p>Scheme through S112E (Waunfawr Road A4085 Underbridge) to reach its existing northern terminus. The portions of PRow Bontnewydd Rhif 26 and PRow Waunfawr Rhif 32 remaining to the west of the Scheme would be stopped-up at the Scheme's boundary.</p>			<p>day (AADT 12 hour 2018).</p>
<p>Footpath - PRow Waunfawr Rhif 31 (625 m west of Caeathro)</p>	<p>The existing footpath would be severed by the Scheme at Ch5000. The footpath would be stopped up either side of the Scheme.</p>	<p>Severe</p>	<p>Major - Moderate Adverse</p>	<p>~370 m after leaving Penrhos, PRow Waunfawr Rhif 31 joins PRow Bontnewydd Rhif 26's diversion: it would be routed north along the eastern boundary of the Scheme for ~300 m to the A4085. It would then be</p>	<p>Slight</p>	<p>Minor Adverse</p>	<p>During operation amenity would be reduced due to exposure to noise, increased air pollution and visual impact from both the Scheme and its route alongside the</p>

				<p>routed north-west for ~200 m alongside the A4085 via a footway, crossing the Scheme through S112E (Waunfawr Road A4085 Underbridge) to reach its existing northern terminus. The portion of PRow Waunfawr Rhif 31 remaining to the west of the Scheme would be stopped-up at the Scheme's boundary.</p>			<p>A4085. It is anticipated that there will be ~2300 vehicles using the A4085 per day (AADT 12 hour 2018).</p>
<p>Footpath - PRow Llanrug Rhif 36 (1 km north-east of the Cibyn Industrial Estate)</p>	<p>The existing footpath would be severed by the Scheme at Ch7050. The footpath would be stopped up either side of the Scheme.</p>	<p>Severe</p>	<p>Major - Moderate Adverse</p>	<p>~250 m after leaving the A4086 near to Kent, PRow Llanrug Rhif 36 would be diverted north-east along the Scheme's eastern boundary for</p>	<p>Slight</p>	<p>Minor Adverse</p>	<p>During operation amenity would be reduced due to exposure to noise, increased air pollution and visual impact.</p>

				~150 m. It would cross the Scheme through S113A and then be routed north-west for ~200 m to join its existing alignment. The portion of PRoW Llanrug Rhif 36 to the west of the Scheme and south of Tyddyn Bistle would cease to exist.			
Shared use path - Proposed in the draft Joint LDP for Anglesey and Gwynedd (100 m west of existing B4366 Roundabout)	The proposed shared use path would be severed by the Scheme at Ch8400.	Moderate	Minor Adverse	The B4366's alignment would remain largely the same, with the B4366 Roundabout moved east ~150 m to accommodate the B4366 crossing the Scheme over S115 (Bethel Road Overbridge). As the shared use path alongside the B4366 is	Neutral	Negligible	Magnitude considered 'Neutral' due to current status of this NMU route. During operation amenity would be reduced due to exposure to noise, increased air pollution and visual impact from the Scheme. A

				currently only a proposal there is no cyclist/pedestrian crossing proposed at the new B4366 Roundabout. However, provision has been made on S115 by means of a verge in order to accommodate the shared use path in the future.			reduction in traffic on the road approaching the new B4366 Roundabout from the North is anticipated to be ~76 %, whereas from the South, the reduction is anticipated to be ~58 % (AADT 12 hour 2018). On balance, the impact on amenity value is considered to be neutral.
Cycleway - NCN 8 (Plas Menai Roundabout)	The existing cycleway would be severed by the Scheme at Plas Menai Roundabout. The cycleway would be stopped up	Severe	Major - Moderate Adverse	NCN 8's alignment would remain largely the same. As a result of the proposal to remove the road leading to Plas Menai National Outdoor Centre	Slight	Minor Adverse	During operation amenity would be impacted very little due to NCN 8's existing proximity to existing roads

	either side of the Scheme.			from Plas Menai Roundabout, NCN 8 would instead cross it (via an at-grade uncontrolled crossing) before it joins Y Felinheli. The net result of this is NCN 8's crossing being moved further from Plas Menai Roundabout.			(including the A487)
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Relief from existing severance and increase in severance

As no operational mitigation is proposed in relation to relief from existing severance the impacts are as described in Section 12.4.2.

Views from the road

At opening year the views out would be more extensive than at the design year when the planting would be established.

Driver stress

Overall, once the Scheme is in operation driver stress levels are predicted to be reduced to a magnitude of impact of 'Moderate Beneficial' due to reduced congestion, enhanced surface quality, reduced frustration and fear of accidents. With the sensitivity considered to be 'Medium' the significance of impact would be 'Moderate - Minor Beneficial'.

12.7 Summary and Conclusions

The Scheme would affect a number of Public Rights of Way surrounding Caernarfon and Bontnewydd. Consultation and field visits have shown that the Public Rights of Way affected do not have significant levels of usage but that numbers rise during the peak summer months.

Through consultation with GC and a number of other user groups measures have been developed to mitigate the impact on rights of way affected by the Scheme. Temporary diversions and crossing places would be provided during the construction phase. Long-term connectivity over the Scheme would be provided via a number of overbridges and underpasses.

Once operational, the Scheme would reduce traffic along the existing A487 and from within Caernarfon, Bontnewydd and surrounding settlements. This would have a beneficial effect for residents of these settlements by reducing severance caused by road traffic between residential areas, community facilities and places of employment. This reduction in severance may encourage increased travel by active modes within these settlements.

With regard to vehicle travellers, in summary the landscape mitigation and Scheme earthworks would result in a generally enclosed road corridor, but with a variety of characteristics along its length. Woodland and hedge planting would primarily be native deciduous species and therefore in places seasonal changes would allow filtered views to the landscape beyond.

During the construction phase there would be increased driver stress levels due to congestion caused by localised traffic management, but these would only operate for short durations. The Scheme, once operational would result in a reduction in drivers' stress levels due to reduced congestion, enhanced surface quality and reduced frustration and fear of accidents.

As the Scheme does not intersect any designated localities under the Active Travel (Wales) Act 2013, the Public Rights of Way affected by it are not considered 'Active Routes'. Consequently, they are not subject to the requirements of the Active Travel (Wales) Act 2013. That said, the Scheme would enhance the provision made for, and have regard to the needs of, walkers and cyclists through the construction of a

dedicated NMU bridge north of Bontnewydd and the moving of NCN 8 further from Plas Menai Roundabout to cross side-roads in a safer location.

These features of the Scheme also help North Wales adhere to Outcome 4 and Objective 9 in the Draft North Wales Joint Local Transport Plan (2015). The proposed Caernarfon to Lon Ogwen MUP has been considered during the Scheme's development and as such, provision for the MUP at structures has been incorporated into its design.

By way of diverting footpaths and cycleways and reducing traffic from within surrounding settlements, the Scheme follows the Gwynedd Unitary Development Plan (2001-2016) Policy CH22 and CH29. The Gwynedd Rights of Way Improvement Plan (2007-2017) and Draft Joint LDP for Anglesey and Gwynedd have also been consulted during the design of the Scheme in order to ensure their objectives and policies are met..

Table 12.7.1 Summary of Impacts in relation to all travelers

Receptor	Description of impact	Magnitude of impact prior to mitigation	Magnitude of impact following mitigation	Significance of impact following mitigation	Comments / notes
Construction Impacts					
Cycleway - NCN 8 (Goat Roundabout)	The existing cycleway would be severed by the Scheme at Ch0000 (Goat Roundabout). The cycleway would be stopped up either side of the Scheme.	Severe	Slight	Minor Adverse	Amenity of route reduced during construction due to exposure to noise and dust and visual impact.
Footpath - PRoW Llanwnda Rhif 19 (300 m north-north-east of Goat Roundabout)	The existing footpath would be severed by the Scheme at Ch0250. The footpath would be stopped up either side of the Scheme.	Severe	Slight	Minor Adverse	Amenity of route reduced during construction due to exposure to noise and dust and visual impact.
Footpath - PRoW Llanwnda Rhif 10 (500 m east-north-east of Dinas)	The existing footpath would be severed by the Scheme at Ch1025. The footpath would be stopped up either side of the Scheme.	Severe	Slight	Minor Adverse	Amenity of route reduced during construction due to exposure to noise and dust and visual impact.
Cycleway - NCN 8 (350 m north-west of)	The existing cycleway would be severed by the	Severe	Slight	Minor Adverse	Amenity of route reduced during construction due to

Receptor	Description of impact	Magnitude of impact prior to mitigation	Magnitude of impact following mitigation	Significance of impact following mitigation	Comments / notes
Bontnewydd WHR Station)	Scheme at Ch2700. The cycleway would be stopped up either side of the Scheme.				exposure to noise and dust and visual impact.
Footpath - PRow Bontnewydd Rhif 27 and PRow Caernarfon Rhif 19 (350 m north of Bontnewydd WHR Station)	The existing footpaths are not severed by the Scheme directly. However, the road both join is severed by the Scheme at Ch2900. Therefore, due to the close proximity of these footpaths, a break in the NMU network would be caused.	Severe	Severe	Major - Moderate Adverse	
Cycleway - Regional Cycleway 61 (1.35 km north-east of Bontnewydd WHR Station)	The existing cycleway would be severed by the Scheme at Ch4050. The cycleway would be stopped up either side of the Scheme.	Severe	Slight	Minor Adverse	Amenity of route reduced during construction due to exposure to noise and dust and visual impact.
Footpath - PRow Bontnewydd Rhif 26 and PRow Waunfawr	The existing footpath would be severed by the Scheme at Ch4900. The footpath would	Severe	Slight	Minor Adverse	Amenity of route reduced during construction due to

Receptor	Description of impact	Magnitude of impact prior to mitigation	Magnitude of impact following mitigation	Significance of impact following mitigation	Comments / notes
Rhif 32 (625 m west of Caeathro)	be stopped up either side of the Scheme.				exposure to noise and dust and visual impact.
Footpath - PRoW Waunfawr Rhif 31 (625 m west of Caeathro)	The existing footpath would be severed by the Scheme at Ch5000. The footpath would be stopped up either side of the Scheme.	Severe	Slight	Minor Adverse	Amenity of route reduced during construction due to exposure to noise and dust and visual impact.
Footpath - PRoW Llanrug Rhif 36 (1 km north-east of the Cibyn Industrial Estate)	The existing footpath would be severed by the Scheme at Ch7050. The footpath would be stopped up either side of the Scheme.	Severe	Slight	Minor Adverse	Amenity of route reduced during construction due to exposure to noise and dust and visual impact.
Shared use path - Proposed in the draft Joint LDP for Anglesey and Gwynedd (100 m west of existing B4366 Roundabout)	The proposed shared use path would be severed by the Scheme at Ch8400.	Moderate	Neutral	Negligible	Magnitude considered 'Neutral' due to current status of this NMU route. Amenity of route reduced during construction due to exposure to noise and dust and visual impact
Cycleway - NCN 8 (Plas Menai Roundabout)	The existing cycleway would be severed by the Scheme at Plas	Severe	Slight	Minor Adverse	Amenity of route reduced during construction due to

Receptor	Description of impact	Magnitude of impact prior to mitigation	Magnitude of impact following mitigation	Significance of impact following mitigation	Comments / notes
	Menai Roundabout. The cycleway would be stopped up either side of the Scheme.				exposure to noise and dust and visual impact
Roundabouts and tie-in points	Driver stress	High	Moderate	Minor Adverse	Views from the existing road network would be dominated by construction activities.
Operational Impacts					
1 - A487 (Goat Roundabout to Llanwnda Roundabout)	Relief from existing severance - 86 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	Medium	Substantial	Major - Moderate Beneficial	
2 - A487 (Llanwnda Roundabout to ~200 metres north of Llanwnda)	Relief from existing severance - 82 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Substantial	Major Beneficial	Potential to be used by residents of Llanwnda
3 - A487 (~200 metres north of Llanwnda to ~300 metres south of Bontnewydd)	Relief from existing severance - 76 % decrease in traffic (2018 AADT 12 hour) from 'Do	Medium	Substantial	Major - Moderate Beneficial	

Receptor	Description of impact	Magnitude of impact prior to mitigation	Magnitude of impact following mitigation	Significance of impact following mitigation	Comments / notes
	Minimum' to 'Yellow' (the Scheme)				
4 - A487 (~300 metres south of Bontnewydd to ~150 metres north of Bontnewydd)	Relief from existing severance - 71 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Substantial	Major Beneficial	Potential to be used by residents of Bontnewydd
5 - Lôn Caeathro (junction with A487 at Bontnewydd to junction with un-named road ~1 kilometre south-west from Caeathro)	Relief from existing severance - 76 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	Medium	Substantial	Major - Moderate Beneficial	
6 - A487 (~150 metres north of Bontnewydd to junction with Pen-y-bryn Road)	Relief from existing severance - 23 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	Medium	Slight	Minor Beneficial	
7 - Un-named road (junction with Lôn Caeathro ~1 kilometre south-west of Caeathro to Caeathro)	Relief from existing severance - 8 % decrease in traffic (2018 AADT 12 hour) from 'Do	High	Slight	Moderate - Minor Beneficial	Potential to be used by residents of Caeathro

Receptor	Description of impact	Magnitude of impact prior to mitigation	Magnitude of impact following mitigation	Significance of impact following mitigation	Comments / notes
	Minimum' to 'Yellow' (the Scheme)				
8 - Lôn Caeathro (junction with un-named road ~1 kilometre from Caeathro to Caeathro Roundabout)	Relief from existing severance - 85 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	Medium	Substantial	Major - Moderate Beneficial	
9 - Pen-y-bryn Road - Rhos Bach Lane (junction with A487 ~1.3 kilometres north of Bontnewydd to Lôn Caeathro)	No change to existing severance - No Change in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Neutral	Negligible	Potential to be used by users of Regional Cycleway 61
10 - A487 (junction with Pen-y-bryn Road to X Roundabout)	Relief from existing severance - 43 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Moderate	Major - Moderate Beneficial	Potential to be used by residents of Caernarfon
11 - Pontrug Way (Caeathro Roundabout to junction with un-	Relief from existing severance - 74 % decrease in traffic (2018 AADT 12 hour) from 'Do	Medium	Substantial	Major - Moderate Beneficial	

Receptor	Description of impact	Magnitude of impact prior to mitigation	Magnitude of impact following mitigation	Significance of impact following mitigation	Comments / notes
named road at Glan Gwna Hall)	Minimum' to 'Yellow' (the Scheme)				
12 - A4085 (Caeathro to Caeathro Roundabout)	Relief from existing severance - 25 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	Medium	Slight	Minor Beneficial	
13 - A4085 (Caeathro to Pont Pellig)	Relief from existing severance - 19 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	Medium	Slight	Minor Beneficial	Potential to be used by residents of Caeathro and at its terminus at PRow Waunfawr Rhif 31. The operational diversion for PRow Waunfawr Rhif 31 and PRow Bontnewydd Rhif 26 runs alongside this route over the Scheme at S112E (Waunfawr Road A4085 Underbridge)
14 - Un-named road/Pontrug Way (Caeathro to Pont-rug)	Relief from existing severance - 67 % decrease in traffic (2018 AADT 12 hour) from 'Do	Medium	Substantial	Major - Moderate Beneficial	

Receptor	Description of impact	Magnitude of impact prior to mitigation	Magnitude of impact following mitigation	Significance of impact following mitigation	Comments / notes
	Minimum' to 'Yellow' (the Scheme)				
15 - St Helen's Road (Caernarfon)	Relief from existing severance - 25 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Slight	Moderate - Minor Beneficial	Potential to be used by residents of Caernarfon and users of NCN 8
16 - A4085 (Pont Peblig to A487)	Relief from existing severance - 15 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Slight	Moderate - Minor Beneficial	Potential to be used by residents of Caernarfon
17 - Castle Hill (Caernarfon)	Relief from existing severance - 3 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Slight	Moderate - Minor Beneficial	Potential to be used by residents of Caernarfon and users of NCN 8
18 - A487 (A4086 Roundabout to Ty Coch Farm/PROW Caernarfon Rhif 2)	Relief from existing severance - 42 % decrease in traffic (2018 AADT 12 hour) from 'Do	High	Moderate	Major - Moderate Beneficial	Potential to be used by residents of Caernarfon

Receptor	Description of impact	Magnitude of impact prior to mitigation	Magnitude of impact following mitigation	Significance of impact following mitigation	Comments / notes
	Minimum' to 'Yellow' (the Scheme)				
19 - Pool Side (Caernarfon)	Increase to existing severance - 1 % increase in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Neutral	Negligible	Potential to be used by residents of Caernarfon
20 - A4086 (A4086 Roundabout to Llanberis Road Roundabout)	Relief from existing severance - 18 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Slight	Moderate - Minor Beneficial	Potential to be used by residents of Caernarfon
21 - Castle Ditch/Castle Square (Caernarfon)	Relief from existing severance - 2 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Slight	Moderate - Minor Beneficial	Potential to be used by residents of Caernarfon
22 - B4366 (X Roundabout to PROW Caernarfon Rhif 2)	Relief from existing severance - 16 % decrease in traffic (2018 AADT 12 hour) from 'Do	High	Slight	Moderate - Minor Beneficial	Potential to be used by residents of Caernarfon and users of the proposed shared use path next to the B4366

Receptor	Description of impact	Magnitude of impact prior to mitigation	Magnitude of impact following mitigation	Significance of impact following mitigation	Comments / notes
	Minimum' to 'Yellow' (the Scheme)				(draft Joint LDP for Anglesey and Gwynedd)
23 - A4086 (Cibyn Industrial Estate to Llanberis Road Roundabout)	Relief from existing severance - 15 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Slight	Moderate - Minor Beneficial	Potential to be used by residents of Caernarfon, especially around the Cibyn Industrial estate
24 - A4086 (Pont-rug to Cibyn Industrial Estate)	Increase to existing severance - 19 % increase in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Neutral	Negligible	Potential to be used by residents of Caernarfon, especially around the Cibyn Industrial estate
25 - Balaclava Road (Caernarfon)	Increase to existing severance - 6 % increase in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Neutral	Negligible	Potential to be used by residents of Caernarfon and users of NCN 8
26 - Bangor Street (Caernarfon)	Increase to existing severance - 1 % increase in traffic (2018 AADT 12	High	Neutral	Negligible	Potential to be used by residents of Caernarfon

Receptor	Description of impact	Magnitude of impact prior to mitigation	Magnitude of impact following mitigation	Significance of impact following mitigation	Comments / notes
	hour) from 'Do Minimum' to 'Yellow' (the Scheme)				
27 - Campbell Road/Priestley Road (Caernarfon)	Increase to existing severance - 10 % increase in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Neutral	Negligible	Potential to be used by residents of Caernarfon
28 - B4366 (PROW Caernarfon Rhif 2 to Bethel Road Roundabout)	Relief from existing severance - 21 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	Medium	Slight	Minor Beneficial	Potential to be used by NMU along the proposed shared use path next to the B4366 (draft Joint LDP for Anglesey and Gwynedd)
29 - A487 (Ty Coch Farm/PROW Caernarfon Rhif 2 to Plas Menai Roundabout)	Relief from existing severance - 44 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	Medium	Moderate	Moderate - Minor Beneficial	
30 - Un-named road (Bethel Road Roundabout to junction with un-	Relief from existing severance - 75 % decrease in traffic (2018 AADT 12	Medium	Substantial	Major - Moderate Beneficial	

Receptor	Description of impact	Magnitude of impact prior to mitigation	Magnitude of impact following mitigation	Significance of impact following mitigation	Comments / notes
named road at Crûg House)	hour) from 'Do Minimum' to 'Yellow' (the Scheme)				
31 - Un-named road (A4086 to Bethel Road Roundabout)	Relief from existing severance - 55 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	Medium	Moderate	Moderate - Minor Beneficial	
32 - B4366 (Bethel Road Roundabout to West Bethel)	Relief from existing severance - 26 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	Medium	Slight	Minor Beneficial	Potential to be used by NMU along the proposed shared use path next to the B4366 (draft Joint LDP for Anglesey and Gwynedd)
33 - Un-named road (between Crûg House and Y Felinheli to B4366 near Bethel)	No change to existing severance - No Change in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	Medium	Neutral	Negligible	
Un-named road (west Bethel to Ganol Street)	Relief from existing severance - 2 % decrease in traffic (2018 AADT 12	High	Slight	Moderate - Minor Beneficial	Potential to be used by residents of Bethel

Receptor	Description of impact	Magnitude of impact prior to mitigation	Magnitude of impact following mitigation	Significance of impact following mitigation	Comments / notes
	hour) from 'Do Minimum' to 'Yellow' (the Scheme)				
B4366 (West Bethel to East Bethel)	Relief from existing severance - 36 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Moderate	Major - Moderate Beneficial	Potential to be used by residents of Bethel
Ganol Street (un-named road to East Bethel)	No change to existing severance - No Change in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	High	Neutral	Negligible	Potential to be used by residents of Bethel
Un-named road (Plas Menai Roundabout to junction with un-named road between Crûg House and Y Felinheli)	Relief from existing severance - 73 % decrease in traffic (2018 AADT 12 hour) from 'Do Minimum' to 'Yellow' (the Scheme)	Medium	Substantial	Major - Moderate Beneficial	Potential to be used by residents of Bethel accessing NCN 8 at Plas Menai Roundabout
Cycleway - NCN 8 (Goat Roundabout)	The existing cycleway would be severed by the Scheme at Ch0000	Severe	Slight	Minor Adverse	During operation, change in amenity value would be negligible due to NCN

Receptor	Description of impact	Magnitude of impact prior to mitigation	Magnitude of impact following mitigation	Significance of impact following mitigation	Comments / notes
	(Goat Roundabout). The cycleway would be stopped up either side of the Scheme.				8's existing proximity to existing roads (including the A487)
Footpath - PRow Llanwnda Rhif 19 (300 m north-north-east of Goat Roundabout)	The existing footpath would be severed by the Scheme at Ch0250. The footpath would be stopped up either side of the Scheme.	Severe	Slight	Minor Adverse	During operation amenity would be reduced due to exposure to noise, increased air pollution and visual impact from the Scheme.
Footpath - PRow Llanwnda Rhif 10 (500 m east-north-east of Dinas)	The existing footpath would be severed by the Scheme at Ch1025. The footpath would be stopped up either side of the Scheme.	Severe	Moderate	Moderate - Minor Adverse	During operation amenity would be reduced due to exposure to noise, increased air pollution and visual impact from the Scheme. A reduction in traffic along Ty'n Llan Road of ~45 % (AADT 12 hour 2018) is anticipated which will result in an increase in amenity value. On balance, the impact on amenity value is considered to be neutral.

Receptor	Description of impact	Magnitude of impact prior to mitigation	Magnitude of impact following mitigation	Significance of impact following mitigation	Comments / notes
Cycleway - NCN 8 (350 m north-west of Bontnewydd WHR Station)	The existing cycleway would be severed by the Scheme at Ch2700. The cycleway would be stopped up either side of the Scheme.	Severe	Slight	Minor Adverse	During operation amenity would be reduced due to exposure to noise, increased air pollution and visual impact.
Footpath - PRow Bontnewydd Rhif 27 and PRow Caernarfon Rhif 19 (350 m north of Bontnewydd WHR Station)	The existing footpaths are not severed by the Scheme directly. However, the road both join is severed by the Scheme at Ch2900. Therefore, due to the close proximity of these footpaths, a break in the NMU network would be caused.	Severe	Slight Beneficial	Minor Beneficial	
Cycleway - Regional Cycleway 61 (1.35 km north-east of Bontnewydd WHR Station)	The existing cycleway would be severed by the Scheme at Ch4050. The cycleway would be stopped up either side of the Scheme.	Severe	Moderate	Moderate - Minor Adverse	During operation amenity would be reduced due to exposure to noise, increased air pollution and visual impact.

Receptor	Description of impact	Magnitude of impact prior to mitigation	Magnitude of impact following mitigation	Significance of impact following mitigation	Comments / notes
Footpath - PRoW Bontnewydd Rhif 26 and PRoW Waunfawr Rhif 32 (625 m west of Caeathro)	The existing footpath would be severed by the Scheme at Ch4900. The footpath would be stopped up either side of the Scheme.	Severe	Slight	Minor Adverse	During operation amenity would be reduced due to exposure to noise, increased air pollution and visual impact from both the Scheme and its route alongside the A4085. It is anticipated that there will be ~2300 vehicles using the A4085 per day (AADT 12 hour 2018).
Footpath - PRoW Waunfawr Rhif 31 (625 m west of Caeathro)	The existing footpath would be severed by the Scheme at Ch5000. The footpath would be stopped up either side of the Scheme.	Severe	Slight	Minor Adverse	During operation amenity would be reduced due to exposure to noise, increased air pollution and visual impact from both the Scheme and its route alongside the A4085. It is anticipated that there will be ~2300 vehicles using the A4085 per day (AADT 12 hour 2018).
Footpath - PRoW Llanrug Rhif 36 (1 km north-east of the	The existing footpath would be severed by the	Severe	Slight	Minor Adverse	During operation amenity would be reduced due to

Receptor	Description of impact	Magnitude of impact prior to mitigation	Magnitude of impact following mitigation	Significance of impact following mitigation	Comments / notes
Cibyn Industrial Estate)	Scheme at Ch7050. The footpath would be stopped up either side of the Scheme.				exposure to noise, increased air pollution and visual impact.
Shared use path - Proposed in the draft Joint LDP for Anglesey and Gwynedd (100 m west of existing B4366 Roundabout)	The proposed shared use path would be severed by the Scheme at Ch8400.	Moderate	Neutral	Negligible	Magnitude considered 'Neutral' due to current status of this NMU route. During operation amenity would be reduced due to exposure to noise, increased air pollution and visual impact from the Scheme. A reduction in traffic on the road approaching the new B4366 Roundabout from the North is anticipated to be ~76 %, whereas from the South, the reduction is anticipated to be ~58 % (AADT 12 hour 2018). On balance, the impact on amenity value is considered to be neutral.

Receptor	Description of impact	Magnitude of impact prior to mitigation	Magnitude of impact following mitigation	Significance of impact following mitigation	Comments / notes
Cycleway - NCN 8 (Plas Menai Roundabout)	The existing cycleway would be severed by the Scheme at Plas Menai Roundabout. The cycleway would be stopped up either side of the Scheme.	Severe	Slight	Minor Adverse	During operation amenity would be impacted very little due to NCN 8's existing proximity to existing roads (including the A487)
Vehicle travellers at Goat Roundabout (Chainage 0) - Chainage 600	Drivers' views of surrounding landscape	Intermittent View			
Vehicle travellers at Chainage 600 - Chainage 1100	Drivers' views of surrounding landscape	No View			
Vehicle travellers at Chainage 1100 - Chainage 1800	Drivers' views of surrounding landscape	Intermittent View			
Vehicle travellers at Chainage 1800 - Chainage 2050 (Gwyrfai Viaduct)	Drivers' views of surrounding landscape	Open View			
Vehicle travellers at Chainage 2050 - Chainage 3000	Drivers' views of surrounding landscape	Restricted View			

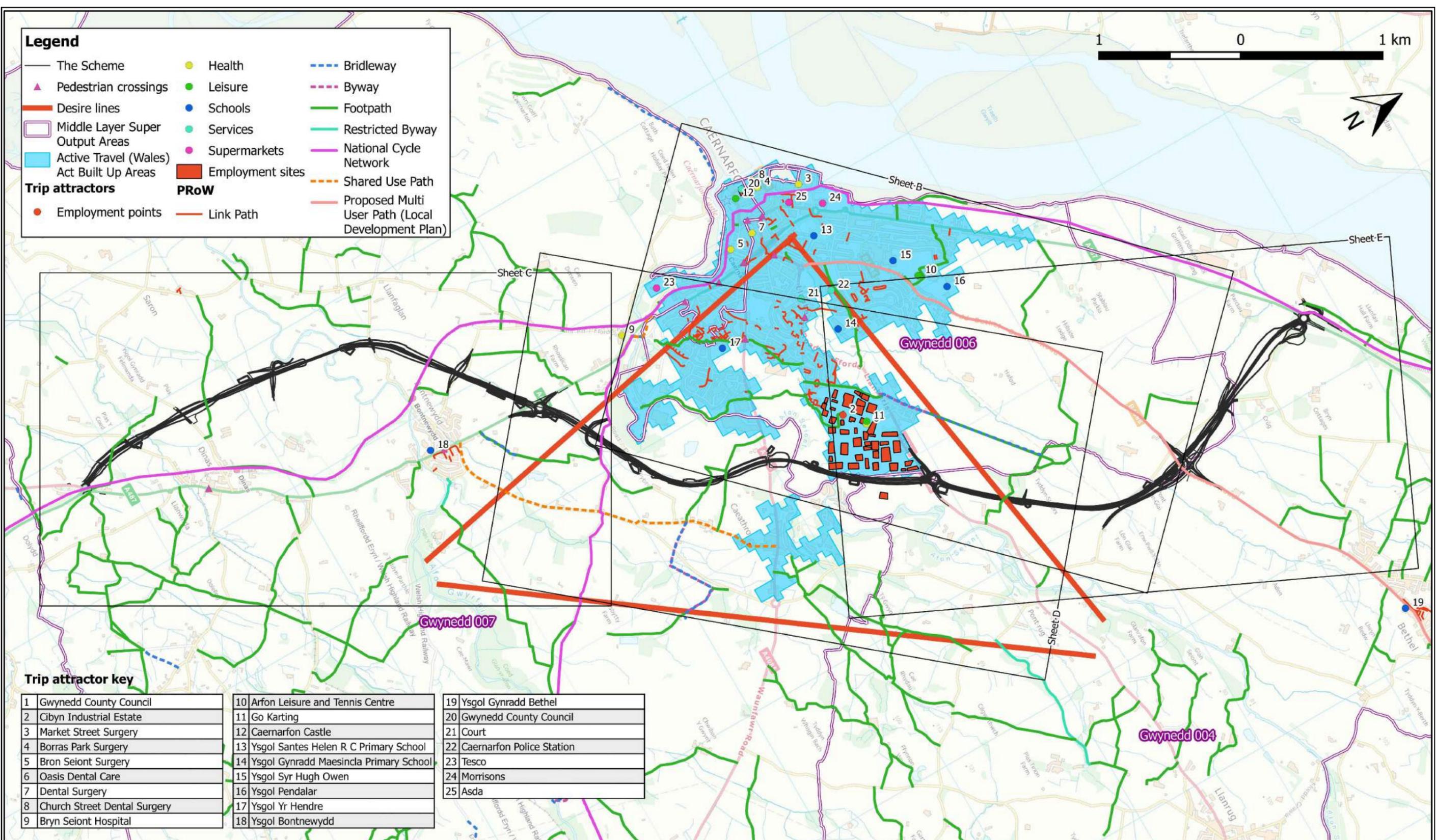
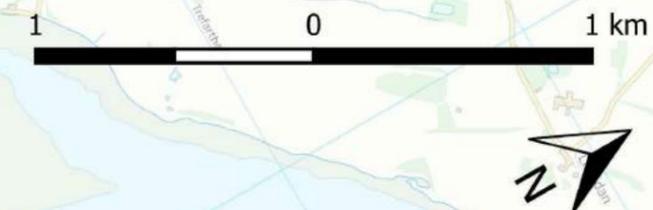
Receptor	Description of impact	Magnitude of impact prior to mitigation	Magnitude of impact following mitigation	Significance of impact following mitigation	Comments / notes
Vehicle travellers at Chainage 3000 - Meifod Roundabout (Chainage 3550)	Drivers' views of surrounding landscape	Intermittent View			
Vehicle travellers at Chainage 3550 - Chainage 4000	Drivers' views of surrounding landscape	Restricted View			
Vehicle travellers at Chainage 4000 - Chainage 4800	Drivers' views of surrounding landscape	Intermittent View			
Vehicle travellers at Chainage 4800 - Chainage 5000	Drivers' views of surrounding landscape	No View			
Vehicle travellers at Chainage 5000 - Chainage 5450	Drivers' views of surrounding landscape	Restricted View			
Vehicle travellers at Chainage 5450 - Chainage 5600 (Seiont Viaduct)	Drivers' views of surrounding landscape	Open View			
Vehicle travellers at Chainage 5600 – Cibyn Roundabout (Chainage 6500)	Drivers' views of surrounding landscape	Restricted View			

Receptor	Description of impact	Magnitude of impact prior to mitigation	Magnitude of impact following mitigation	Significance of impact following mitigation	Comments / notes
Vehicle travellers at Chainage 6500 – Chainage 8100	Drivers' views of surrounding landscape	Intermittent View			
Vehicle travellers at Chainage 8100 – Chainage 8900 (main line)	Drivers' views of surrounding landscape	Restricted View			
Vehicle travellers at Realigned Crug Lane unclassified road and Bethel Road Roundabout	Drivers' views of surrounding landscape	Intermittent View			
Vehicle travellers at Chainage 8900 – Chainage 9600	Drivers' views of surrounding landscape	No View			
Vehicle travellers at Chainage 9600 – Plas Menai Roundabout (Chainage 9750)	Drivers' views of surrounding landscape	Open view			
Vehicle travellers across the whole Scheme	Driver stress levels are predicted to be reduced to 'Medium Beneficial' due to reduced congestion, enhanced surface quality, reduced	Medium Beneficial	Medium Beneficial	Medium Beneficial	

Receptor	Description of impact	Magnitude of impact prior to mitigation	Magnitude of impact following mitigation	Significance of impact following mitigation	Comments / notes
	frustration and fear of accidents.				

Legend

- The Scheme
- ▲ Pedestrian crossings
- Desire lines
- Middle Layer Super Output Areas
- Active Travel (Wales) Act Built Up Areas
- Trip attractors
- Employment points
- Health
- Leisure
- Schools
- Services
- Supermarkets
- Employment sites
- Bridleway
- Byway
- Footpath
- Restricted Byway
- National Cycle Network
- Shared Use Path
- Proposed Multi User Path (Local Development Plan)
- PRoW
- Link Path



Trip attractor key

1 Gwynedd County Council	10 Arfon Leisure and Tennis Centre	19 Ysgol Gynradd Bethel
2 Cibyn Industrial Estate	11 Go Karting	20 Gwynedd County Council
3 Market Street Surgery	12 Caernarfon Castle	21 Court
4 Borras Park Surgery	13 Ysgol Santes Helen R C Primary School	22 Caernarfon Police Station
5 Bron Seiont Surgery	14 Ysgol Gynradd Maesincla Primary School	23 Tesco
6 Oasis Dental Care	15 Ysgol Syr Hugh Owen	24 Morrisons
7 Dental Surgery	16 Ysgol Pendalar	25 Asda
8 Church Street Dental Surgery	17 Ysgol Yr Hendre	
9 Bryn Seiont Hospital	18 Ysgol Bontnewydd	

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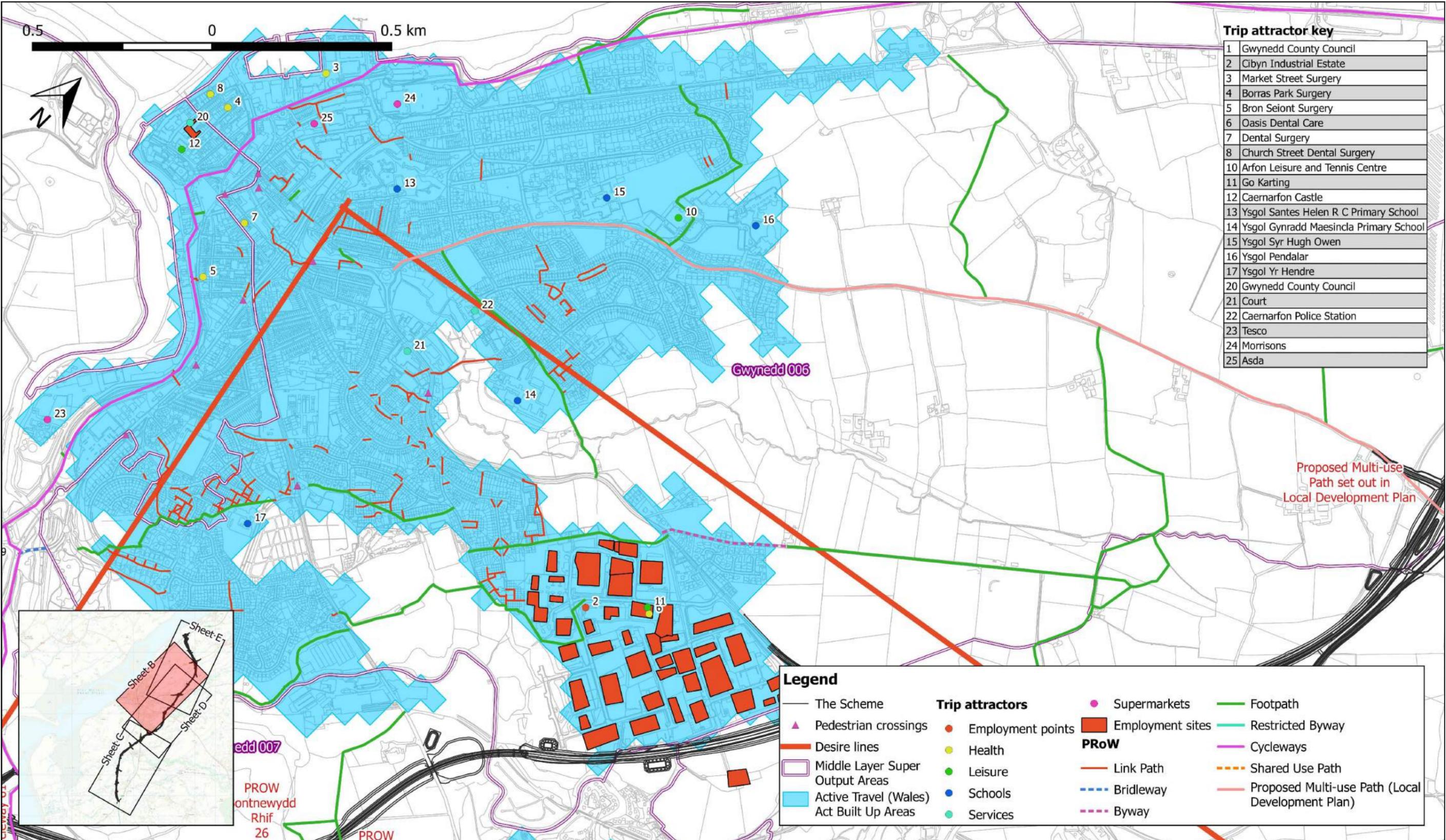
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 Effects On All Travellers
 NMU Contextual Information (a-e)
 Sheet 1 of 5

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Trip attractor key

1	Gwynedd County Council
2	Gibyn Industrial Estate
3	Market Street Surgery
4	Borras Park Surgery
5	Bron Seiont Surgery
6	Oasis Dental Care
7	Dental Surgery
8	Church Street Dental Surgery
10	Arfon Leisure and Tennis Centre
11	Go Karting
12	Caernarfon Castle
13	Ysgol Santes Helen R C Primary School
14	Ysgol Gynradd Maesindla Primary School
15	Ysgol Syr Hugh Owen
16	Ysgol Pendalar
17	Ysgol Yr Hendre
20	Gwynedd County Council
21	Court
22	Caernarfon Police Station
23	Tesco
24	Morrisons
25	Asda

Legend

— The Scheme	Trip attractors	● Supermarkets	— Footpath
▲ Pedestrian crossings	● Employment points	■ Employment sites	— Restricted Byway
— Desire lines	● Health	PRoW	— Cycleways
□ Middle Layer Super Output Areas	● Leisure	— Link Path	— Shared Use Path
■ Active Travel (Wales) Act Built Up Areas	● Schools	— Bridleway	— Proposed Multi-use Path (Local Development Plan)
	● Services	— Byway	

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Effects On All Travellers
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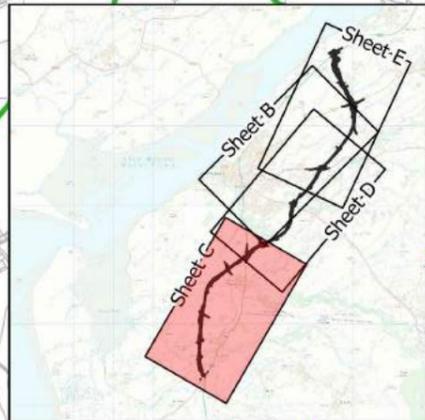
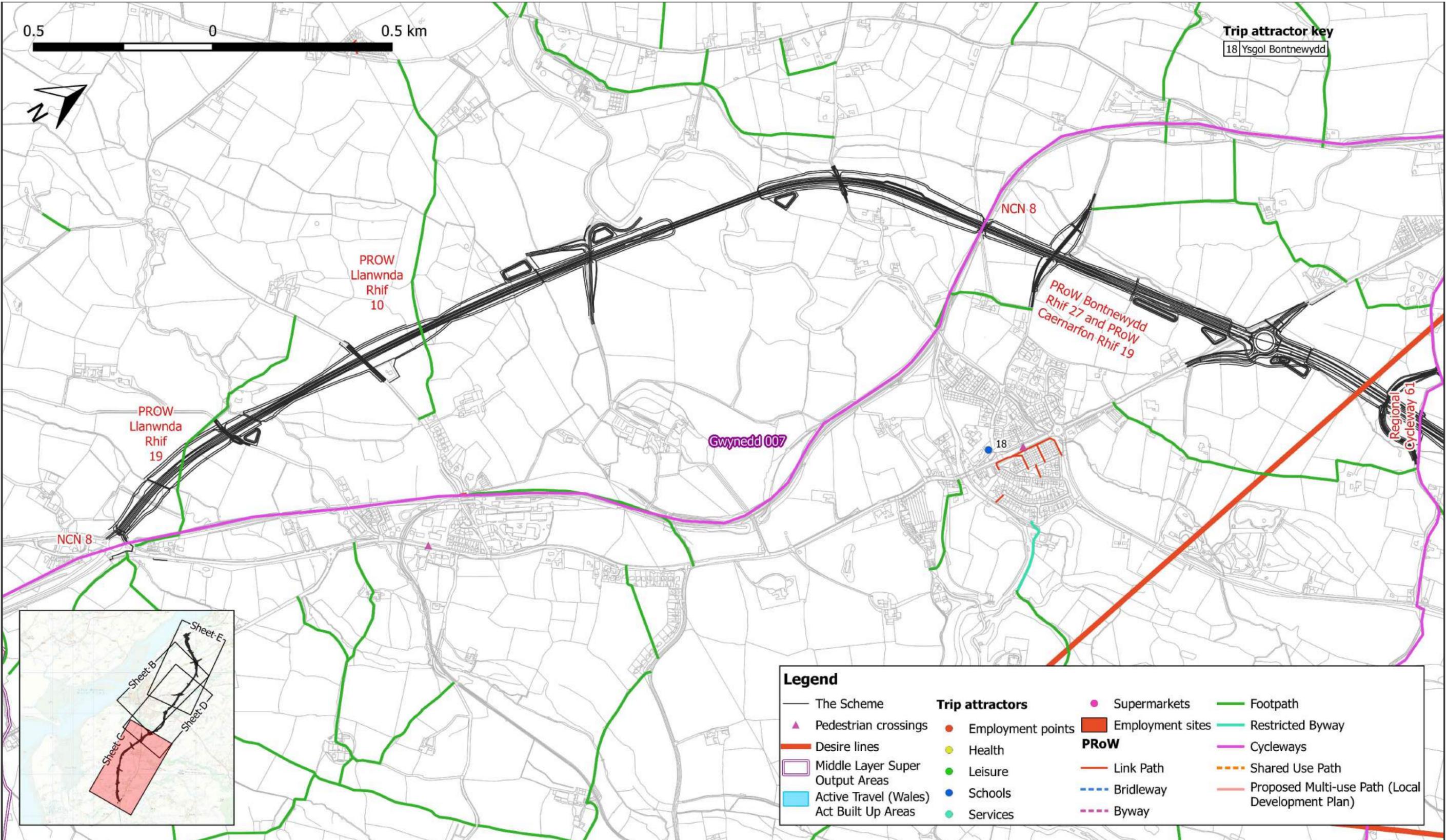
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Legend			
—	The Scheme	●	Supermarkets
▲	Pedestrian crossings	●	Employment points
—	Desire lines	■	Employment sites
□	Middle Layer Super Output Areas	●	Health
■	Active Travel (Wales) Act Built Up Areas	●	Leisure
—		●	Schools
—		●	Services
—		—	Link Path
—		—	Bridleway
—		—	Byway
—		—	Footpath
—		—	Restricted Byway
—		—	Cycleways
—		—	Shared Use Path
—		—	Proposed Multi-use Path (Local Development Plan)

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 Effects On All Travellers
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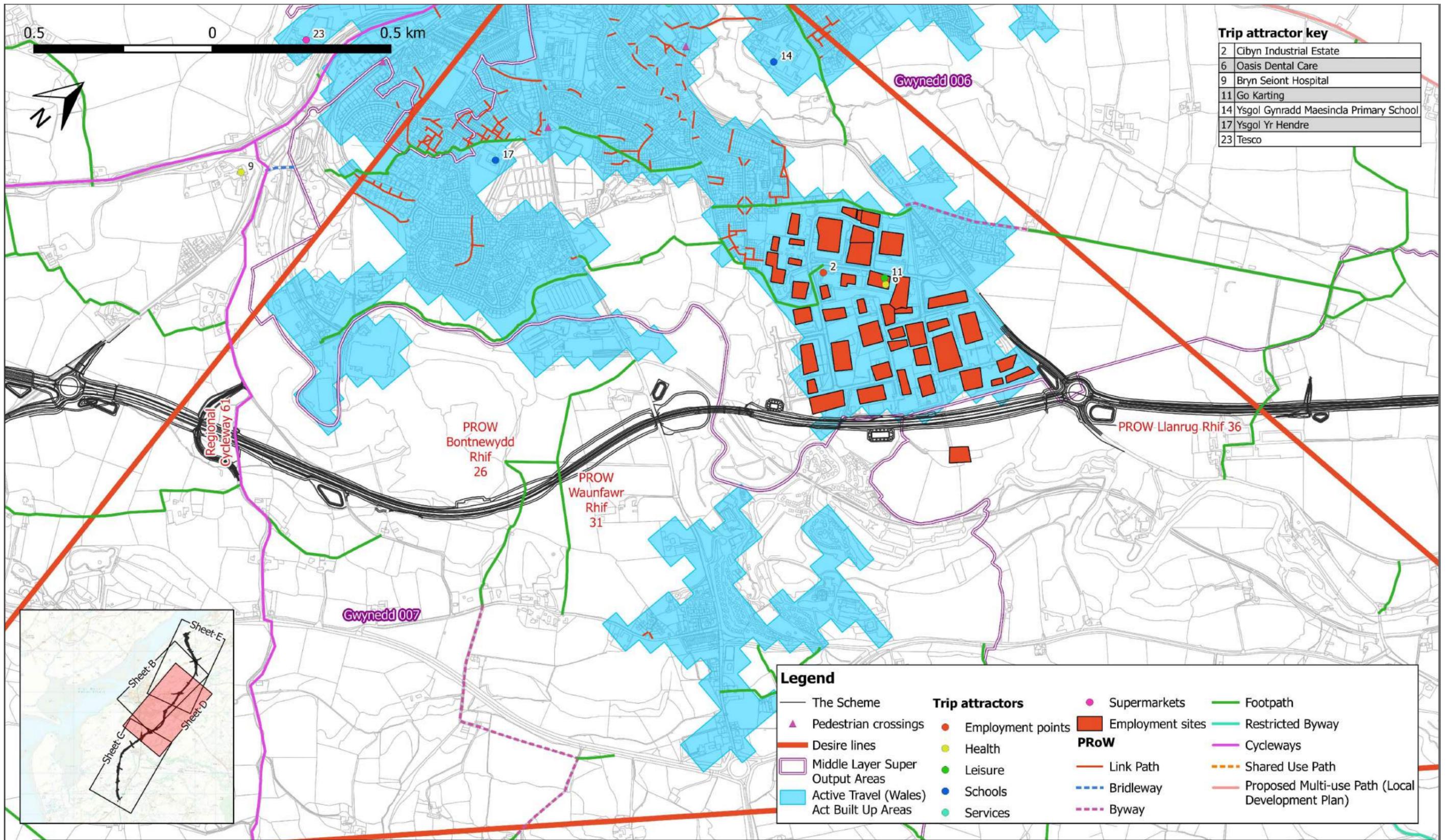
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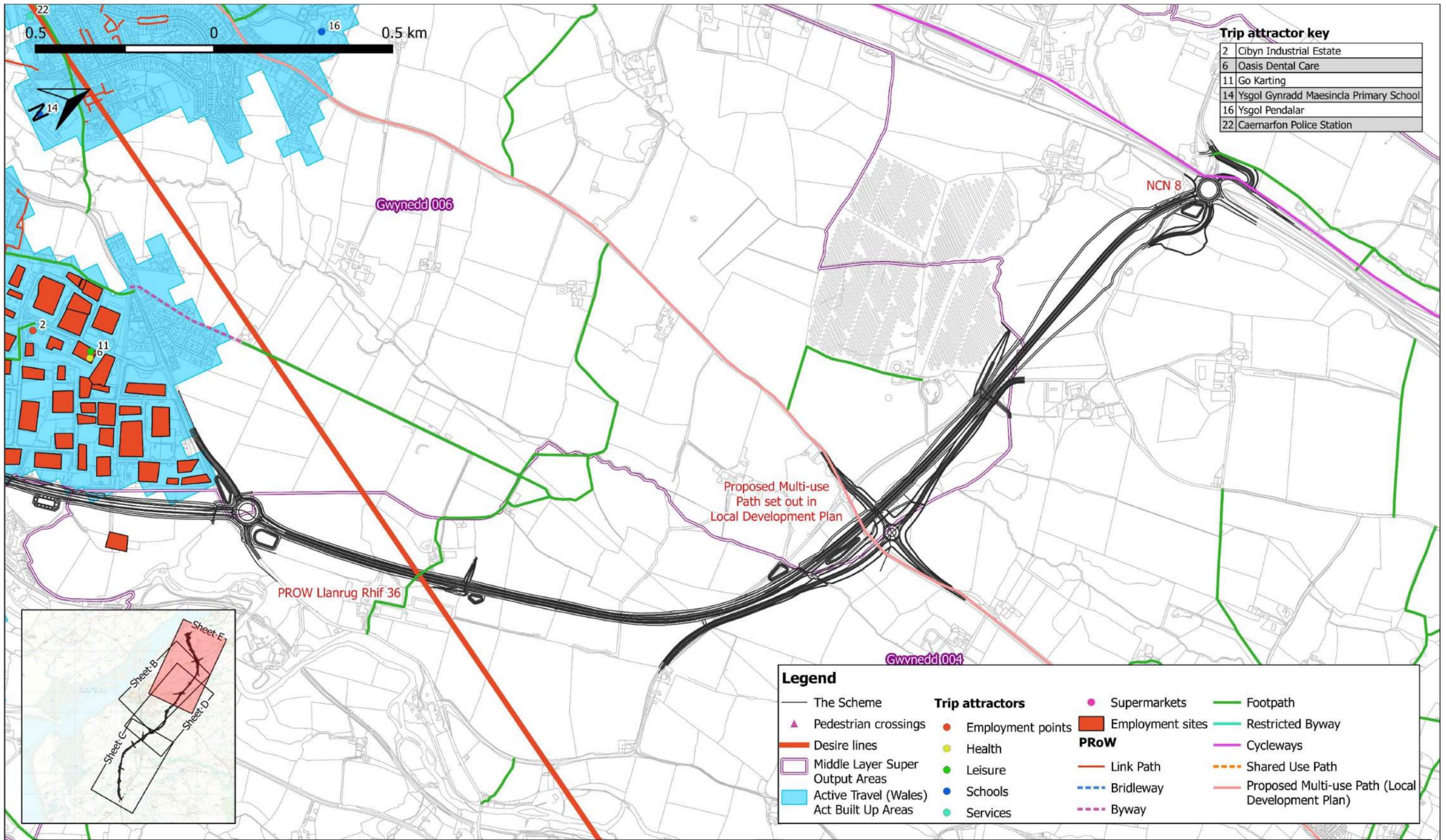
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Trip attractor key

2	Cibyn Industrial Estate
6	Oasis Dental Care
11	Go Karting
14	Ysgol Gynradd Maesinda Primary School
16	Ysgol Pendalar
22	Caernarfon Police Station

Legend

— The Scheme	Trip attractors	● Supermarkets	— Footpath
▲ Pedestrian crossings	● Employment points	■ Employment sites	— Restricted Byway
— Desire lines	● Health	PRoW	— Cycleways
□ Middle Layer Super Output Areas	● Leisure	— Link Path	— Shared Use Path
■ Active Travel (Wales) Act Built Up Areas	● Schools	--- Bridleway	— Proposed Multi-use Path (Local Development Plan)
	● Services	--- Byway	

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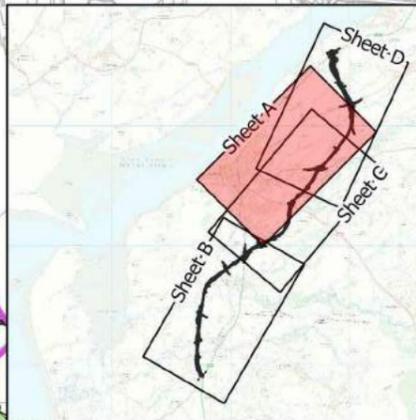
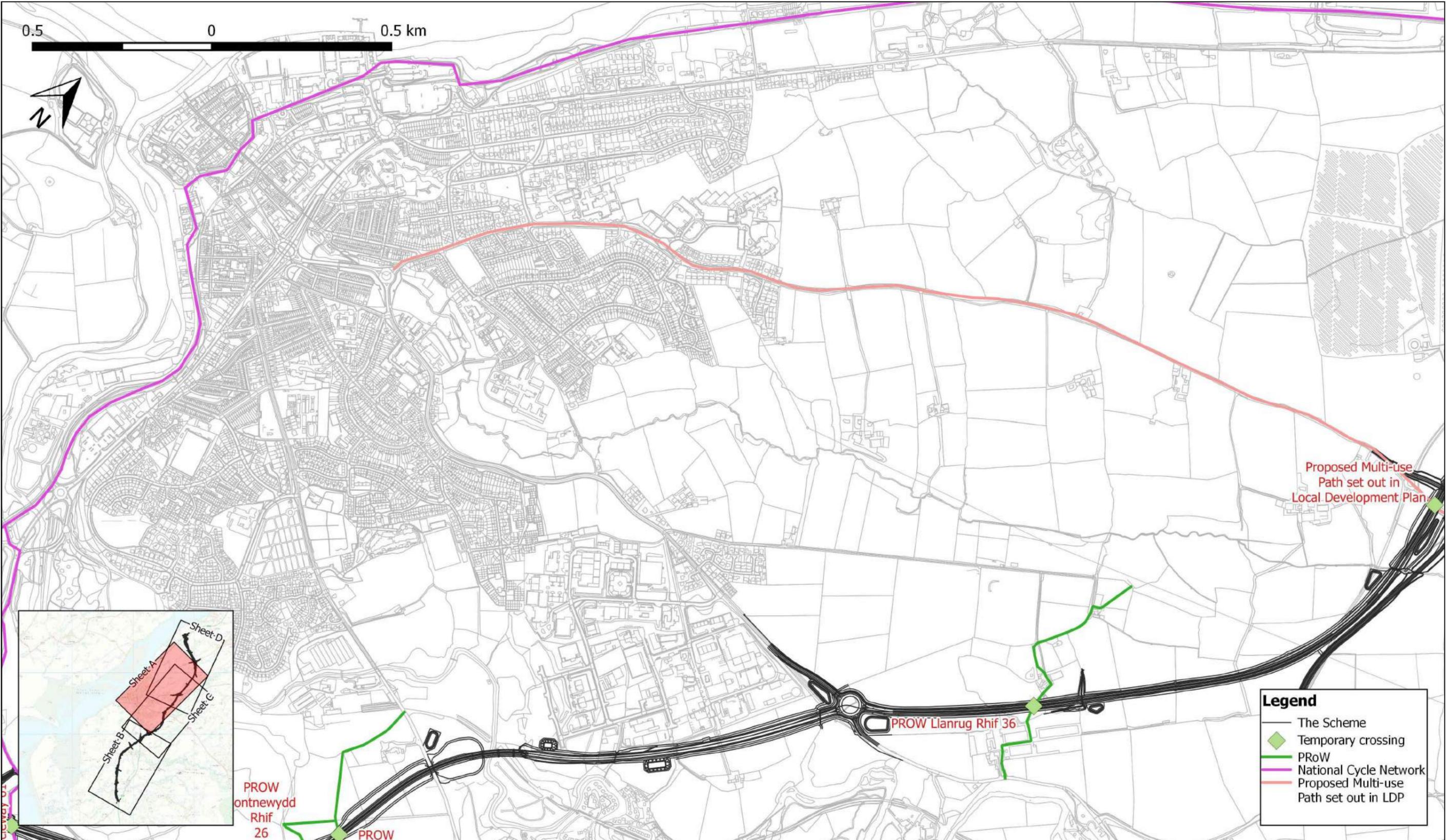
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Legend	
	The Scheme
	Temporary crossing
	PRoW
	National Cycle Network
	Proposed Multi-use Path set out in LDP

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A487 CAERNARFON AND BONTNEWYDD BYPASS

Effects On All Travellers
 NMU Construction Impact and Mitigation (a-d)
 Sheet 1 of 4

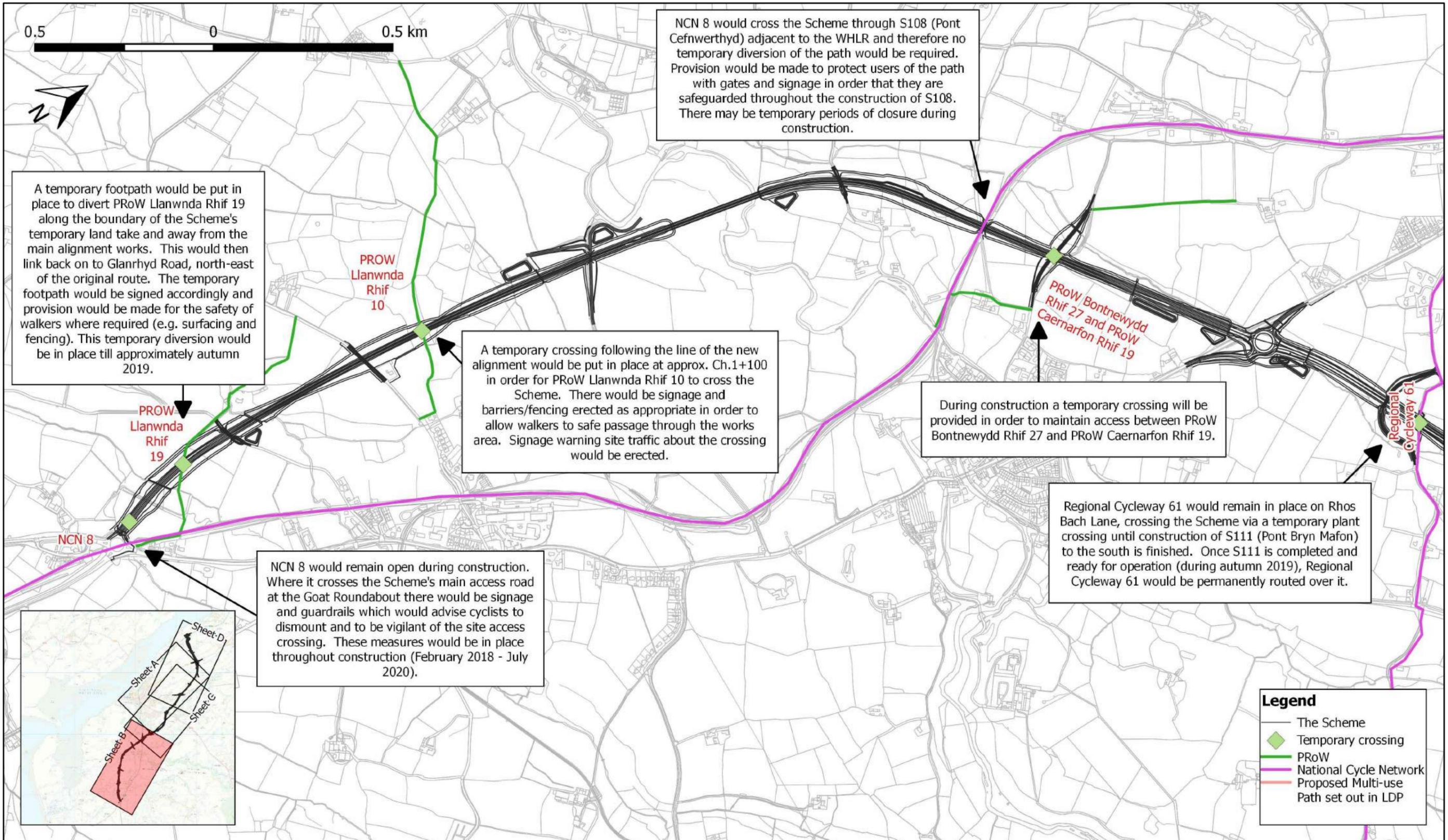
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NCN 8 would cross the Scheme through S108 (Pont Cefnwerthyd) adjacent to the WHLR and therefore no temporary diversion of the path would be required. Provision would be made to protect users of the path with gates and signage in order that they are safeguarded throughout the construction of S108. There may be temporary periods of closure during construction.

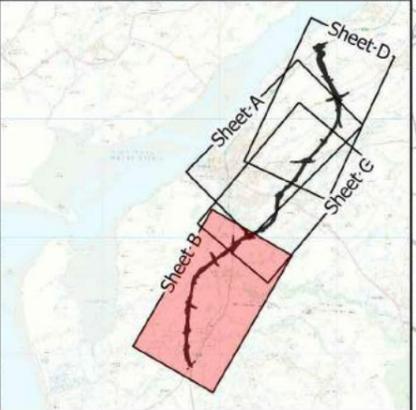
A temporary footpath would be put in place to divert PRoW Llanwnda Rhif 19 along the boundary of the Scheme's temporary land take and away from the main alignment works. This would then link back on to Glanrhyd Road, north-east of the original route. The temporary footpath would be signed accordingly and provision would be made for the safety of walkers where required (e.g. surfacing and fencing). This temporary diversion would be in place till approximately autumn 2019.

A temporary crossing following the line of the new alignment would be put in place at approx. Ch.1+100 in order for PRoW Llanwnda Rhif 10 to cross the Scheme. There would be signage and barriers/fencing erected as appropriate in order to allow walkers to safe passage through the works area. Signage warning site traffic about the crossing would be erected.

During construction a temporary crossing will be provided in order to maintain access between PRoW Bontnewydd Rhif 27 and PRoW Caernarfon Rhif 19.

Regional Cycleway 61 would remain in place on Rhos Bach Lane, crossing the Scheme via a temporary plant crossing until construction of S111 (Pont Bryn Mafon) to the south is finished. Once S111 is completed and ready for operation (during autumn 2019), Regional Cycleway 61 would be permanently routed over it.

NCN 8 would remain open during construction. Where it crosses the Scheme's main access road at the Goat Roundabout there would be signage and guardrails which would advise cyclists to dismount and to be vigilant of the site access crossing. These measures would be in place throughout construction (February 2018 - July 2020).



Legend

- The Scheme
- Temporary crossing
- PRoW
- National Cycle Network
- Proposed Multi-use Path set out in LDP

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 Effects On All Travellers
 NMU Construction Impact and Mitigation (a-d)
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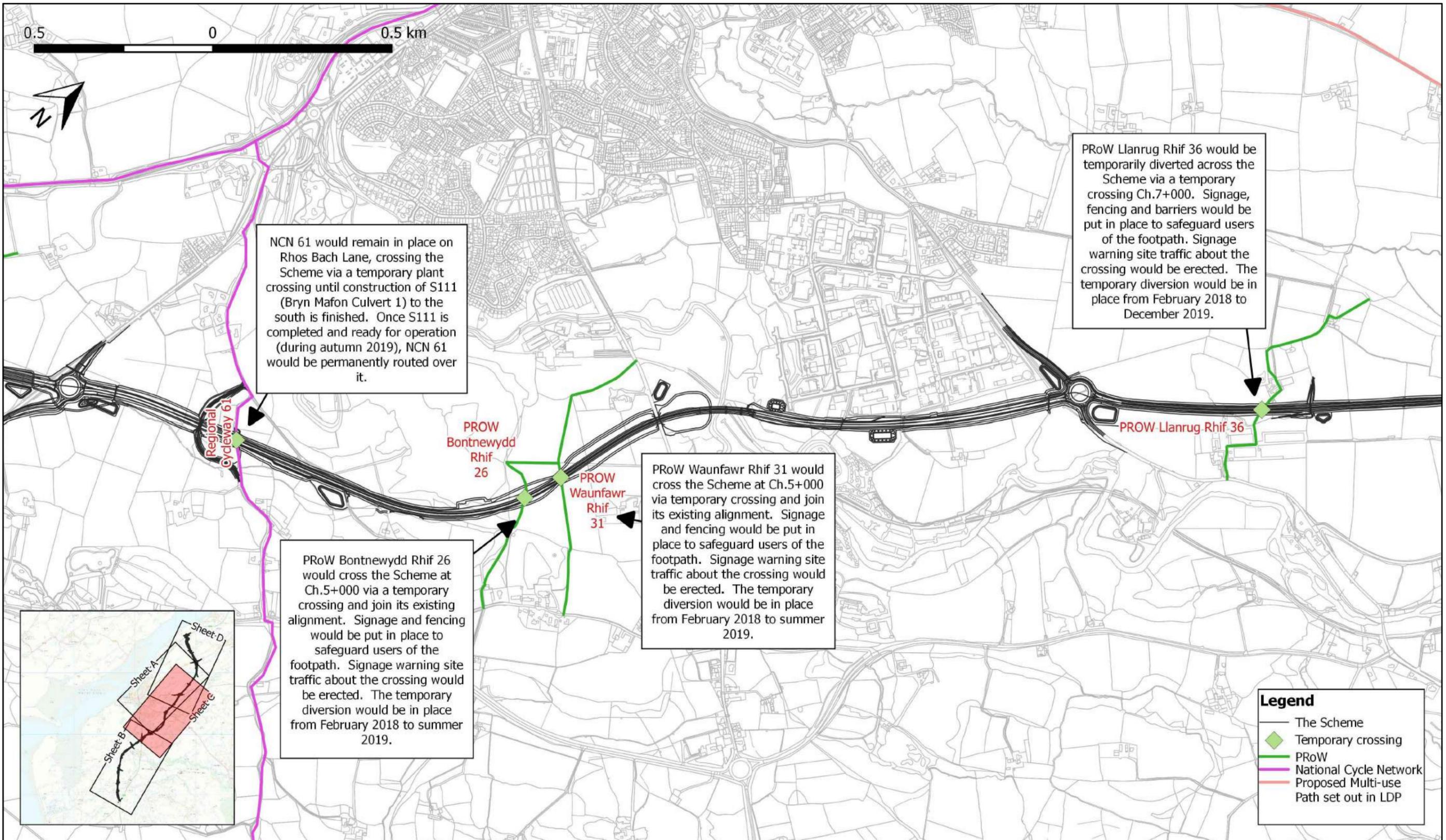
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NCN 61 would remain in place on Rhos Bach Lane, crossing the Scheme via a temporary plant crossing until construction of S111 (Bryn Mafon Culvert 1) to the south is finished. Once S111 is completed and ready for operation (during autumn 2019), NCN 61 would be permanently routed over it.

PRow Llanrug Rhif 36 would be temporarily diverted across the Scheme via a temporary crossing Ch.7+000. Signage, fencing and barriers would be put in place to safeguard users of the footpath. Signage warning site traffic about the crossing would be erected. The temporary diversion would be in place from February 2018 to December 2019.

PRow Waunfawr Rhif 31 would cross the Scheme at Ch.5+000 via temporary crossing and join its existing alignment. Signage and fencing would be put in place to safeguard users of the footpath. Signage warning site traffic about the crossing would be erected. The temporary diversion would be in place from February 2018 to summer 2019.

PRow Bontnewydd Rhif 26 would cross the Scheme at Ch.5+000 via a temporary crossing. Signage and fencing would be put in place to safeguard users of the footpath. Signage warning site traffic about the crossing would be erected. The temporary diversion would be in place from February 2018 to summer 2019.

Legend

- The Scheme
- ◆ Temporary crossing
- PRow
- National Cycle Network
- Proposed Multi-use Path set out in LDP

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A487 CAERNARFON AND BONTNEWYDD BYPASS

Effects On All Travellers
 NMU Construction Impact and Mitigation (a-d)
 Sheet 3 of 4

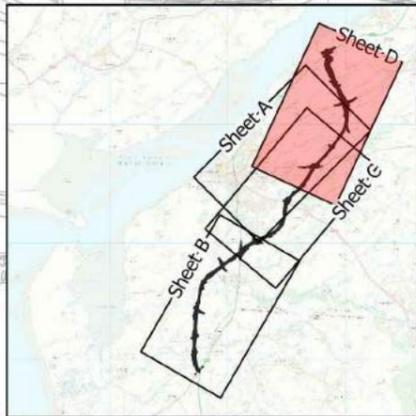
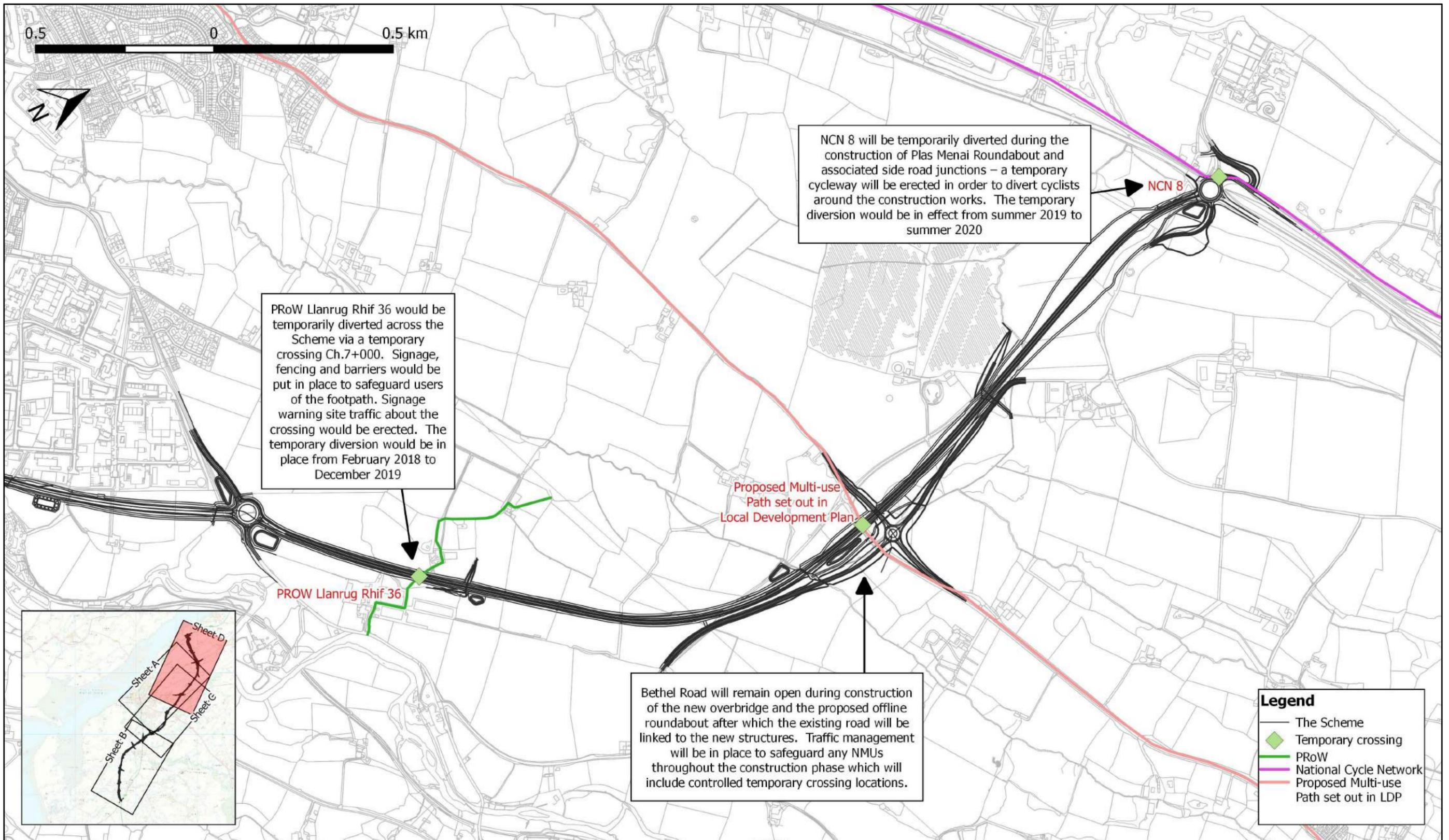
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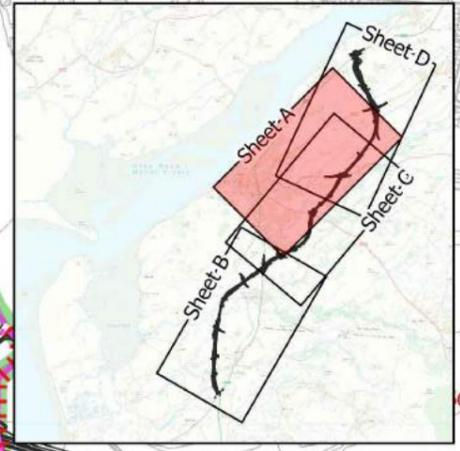
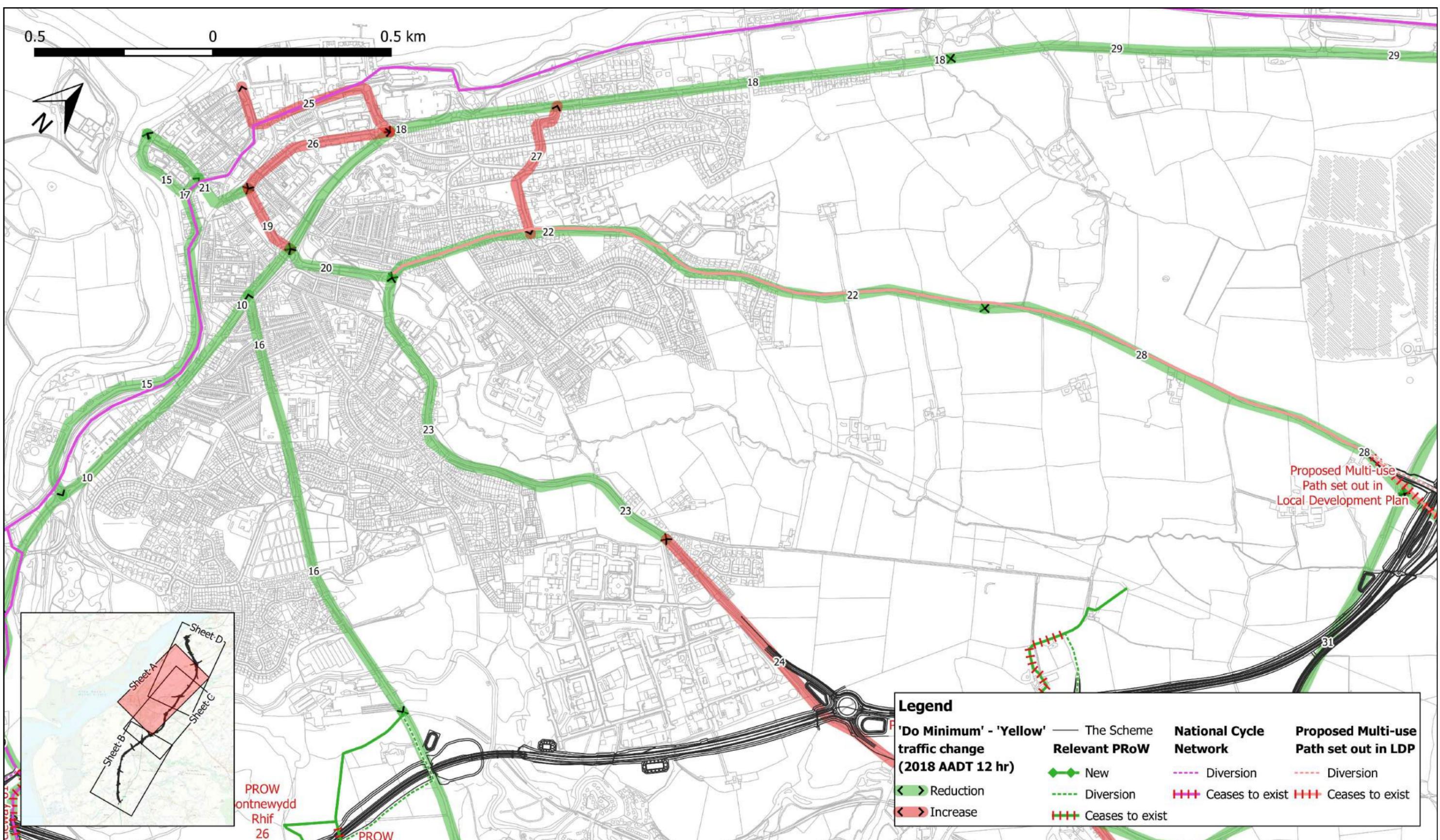
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0.5 0 0.5 km



Legend		National Cycle Network		Proposed Multi-use Path set out in LDP	
'Do Minimum' - 'Yellow' traffic change (2018 AADT 12 hr)		Relevant PRow		Proposed Multi-use Path set out in LDP	
Reduction	Increase	New	Diversion	Diversion	Ceases to exist
Reduction	Increase	Diversion	Ceases to exist	Ceases to exist	Ceases to exist
Increase		Ceases to exist			

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Effects On All Travellers
 NMU Operational (2018) Impact and Mitigation (a-d)
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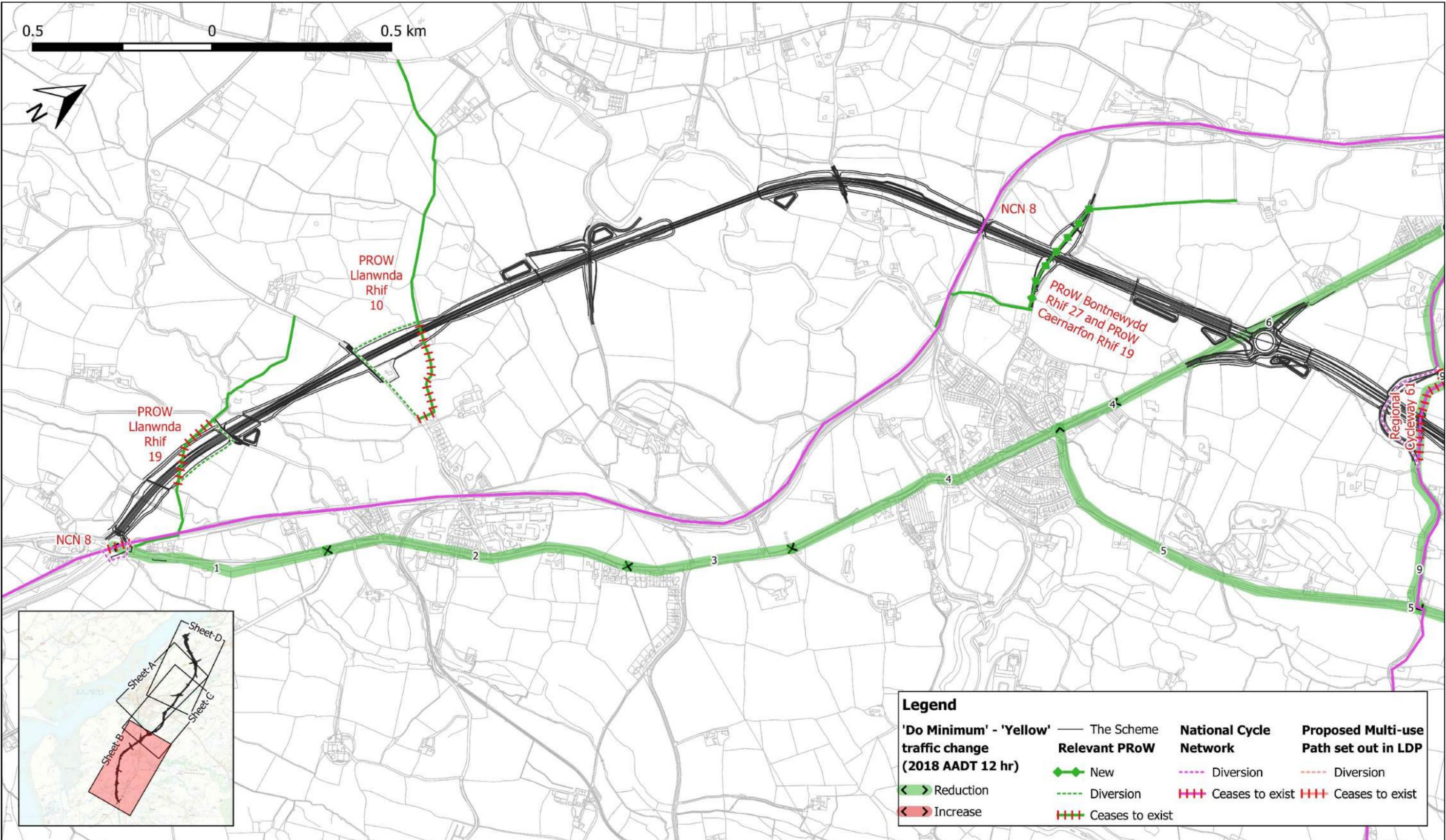
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Legend

'Do Minimum' - 'Yellow' traffic change (2018 AADT 12 hr)	— The Scheme	National Cycle Network	Proposed Multi-use Path set out in LDP
↔ Reduction	↔ New	--- Diversion	--- Diversion
↔ Increase	--- Diversion	+++ Ceases to exist	+++ Ceases to exist
	+++ Ceases to exist		

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Effects On All Travellers
 NMU Operational (2018) Impact and Mitigation (a-d)
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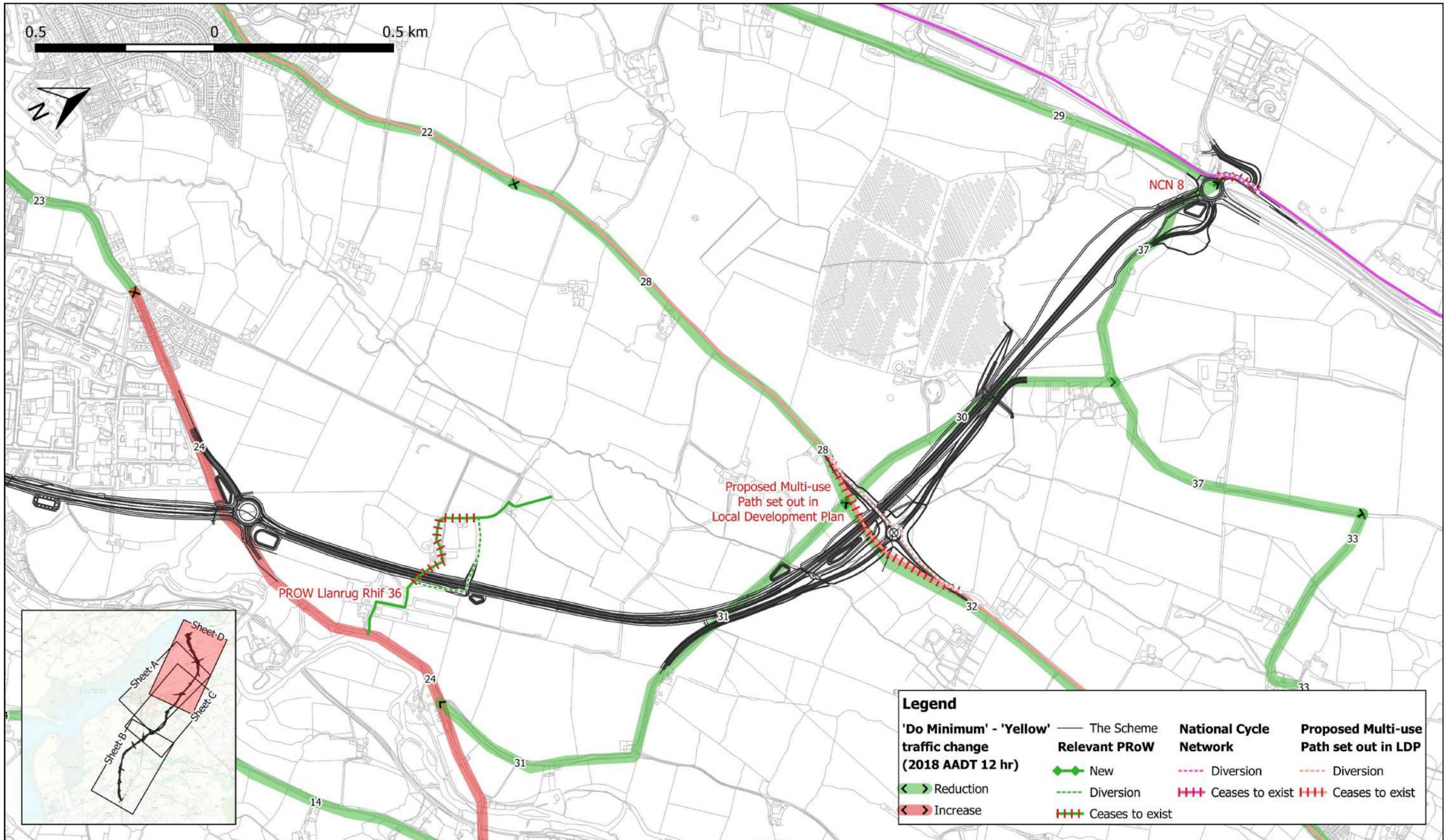
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FIGURE NUMBER	12.3b		



Legend		National Cycle Network		Proposed Multi-use Path set out in LDP	
'Do Minimum' - 'Yellow' traffic change (2018 AADT 12 hr)	— The Scheme	— Relevant PROW	— National Cycle Network	— Proposed Multi-use Path set out in LDP	— Proposed Multi-use Path set out in LDP
< > Reduction	◆ New	◆ New	◆ New	◆ New	◆ New
< > Increase	--- Diversion	--- Diversion	--- Diversion	--- Diversion	--- Diversion
	+++ Ceases to exist	+++ Ceases to exist	+++ Ceases to exist	+++ Ceases to exist	+++ Ceases to exist

REV	DATE	DESCRIPTION	BY	CHKD	APPD

A487 CAERNARFON AND BONTNEWYDD BYPASS

Effects On All Travellers
 NMU Operational (2018) Impact and Mitigation (a-d)
 Sheet 4 of 4

Llywodraeth Cymru / Welsh Government
Balfour Beatty JONES BROS CIVIL ENGINEERING UK
ARCADIS **RAMBOLL** **WSP** **PARSONS BRINCKERHOFF** **TACP**
 Ty Glyn, Canol Y Dre, Ruthin, Denbighshire Tel: 01824 703661

• DATE	29/06/16	DRAWN BY	RW
• SCALE	Not To Scale	DESIGNED	
		CHECKED	LJ
		APPROVED	PM
• FIGURE NUMBER			
12.3d			

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