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## A487 New Dyfi Bridge

Environmental Statement –  
Volume 1: Chapter 13 Effects on  
Travellers

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## 13 Effects on Travellers

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### 13.1 Introduction

- 13.1.1** This Chapter provides assessment of the potential effects of the Scheme on vehicle travellers, as stipulated within Design Manual for Roads and Bridges (DMRB), Volume 11, Section 3, Part 9, Vehicle Travellers (Highways Agency, 1993b); and for Non-Motorised Users (NMUs), as required by DMRB, Volume 11, Section 3, Part 8, Pedestrians, Cyclists, Equestrians and Community Effects (Highways Agency, 1993b). The assessment topic of ‘Effects on All Travellers’ was introduced into standard highway environmental assessment guidance through IAN 125/09(W).
- 13.1.2** The assessment of effects on all travellers also considers effects on community severance in terms of the separation of residents from facilities and services they use within their community caused by new or improved roads or by changes in traffic flows.
- 13.1.3** This assessment also considers whether vehicle drivers could be significantly affected in relation to driver stress and their views of the road. Views from the road are assessed in relation to general driving conditions rather than visual amenity. Driver stress is defined as the adverse mental and physiological effects experienced by a driver travelling the road network.
- 13.1.4** This assessment assesses the likely effects on all vehicle travellers and NMUs likely to use the new section of A487 single carriageway trunk road north of Machynlleth which incorporates a new crossing of the Afon Dyfi upstream of the existing road bridge Pont-ar-Ddyfi. The assessment also assesses the likely effects on NMUs likely to use the existing Pont-ar-Ddyfi post scheme.
- 13.1.5** The Scheme consists of a new viaduct structure across the floodplain and a river bridge to cross the Afon Dyfi approximately 480m upstream of the existing Pont-ar-Ddyfi. The length of the Scheme is approximately 1200m with approximately 720m on a viaduct.
- 13.1.6** The typical carriageway width would be the same on the viaduct across the floodplain and river, although with a reduced verge width on the eastern side of the carriageway from 2.5 m to 0.6 m on the viaduct and bridge. The viaduct would accommodate a shared footway/cycleway and associated 1.4m high parapet.
- 13.1.7** The majority of the Scheme would have a National speed limit (60mph). A 30mph speed limit would be provided on the A487 at the southern end of the Scheme, for approximately the first

200m, reflecting the existing speed limit. A further 200m long 'buffer section' of 40mph speed limit would be introduced as a transition between the 30mph and 60mph. A 300m long section of 30mph speed limit would be introduced on the A493 along with traffic calming in the form of build-outs into the carriageway immediately north of Pont-ar-Ddyfi near Pen-y-Bont Cottages. Give Way lines would create a priority single lane requiring westbound traffic to give priority to opposing eastbound traffic. The build-outs would provide a raised footway along the front of existing Pen-y-Bont Cottages, with a safe Non-Motorised User crossing point on the Wales Coast Path and National Cycle Route No.82.

**13.1.8** The existing A487 south of Pont-ar-Ddyfi would be de-trunked and a no-through route formed by installing a line of bollards on both the north and south side of Pont-ar-Ddyfi. Access to the section of de-trunked A487 south of the river would be provided from the new southern T-junction located opposite to the Dyfi Eco Park.

**13.1.9** Two new pumped drainage systems would be installed at the Cambrian Line Railway Bridge and the Pen-y-Bont cottages which combined with upgraded drainage systems, where appropriate, will address flooding issues in both these areas. At the Cambrian Line Railway Bridge the western flood bund would prevent overland flow from river flooding, and the pumped drainage system would discharge to the west of the bund via the normal highway drainage outfalls. At Pen-y-Bont cottages, the existing surface water drainage would be upgraded and a pumped system will discharge to the Afon Dyfi during storm events.

## **13.2 Legislation, Policy Context and Guidance**

**13.2.1** Chapter 5 of this ES provides an overarching and strategic legislative context for the Scheme from an environmental perspective. The following sections outline the legislation and planning policies that are relevant to this assessment.

### **Legislation**

#### **Active Travel (Wales) Act (2013) and Active Travel Action Plan (2016)**

**13.2.2** The Active Travel (Wales) Act 2013 requires '*...Welsh Ministers and local authorities to take reasonable steps to enhance the provision made for, and to have regard to the needs of, walkers and cyclists; for requiring functions under the Act to be exercised so as to promote active travel journeys and secure new and*

*improved active travel routes and related facilities; and for connected purposes*'. This is supported by the Active Travel Action Plan (2016). The Act, produced by the Welsh Government, places a legal requirement on local authorities to map and plan suitable routes for walking and cycling. It creates duties for highways authorities to consider the needs of walkers and cyclists, and provides better provision for them. Importantly, it requires new road schemes to consider the needs of pedestrians and cyclists at design stage and to take reasonable steps to enhance the provision made for walkers and cyclists.

**13.2.3** The Act requires local authorities in Wales to produce active travel maps and deliver year on year improvements in active travel routes and facilities. The first stage requires local authorities to produce an Existing Routes Map (ERM) for each 'designated area' and submit these to Welsh Government by 22 January 2016.

**13.2.4** The Active Travel Action Plan aims to implement the Act. The following active travel objectives underpin the Action Plan:

- Improve the health and well-being of Wales through increased physical activity;
- Improve the local environment for walkers and cyclists;
- Encourage sustainable travel to combat climate change;
- Increase levels of walking and cycling through promotion; and
- Ensure that walking and cycling are prioritised in policies, guidance and funding.

**13.2.5** The Design Guidance (Welsh Government, 2014) relating to the Active Travel (Wales) Act 2013 sets out guidance for those involved in the planning, design, approval, construction and maintenance of Active Travel routes and associated facilities in Wales. This aims to inform the development of a network of walking and cycling routes that serve a variety of purposes and connect key locations such as workplaces, hospitals, schools and shopping areas.

**13.2.6** The Design Guidance document is intended to ensure that the requirements of the Active Travel Act are applied consistently and appropriately. Advice in the guidance must be considered when designing active travel routes on trunk roads.

### **Countryside and Rights of Way Act (2000)**

**13.2.7** This legislation provides for public access on foot to areas of open land comprising mountain, moor, heath, down, and registered common land; amends the law relating to Public Rights of Way (PRoW); increases protection for Sites of Special Scientific Interest (SSSIs) and strengthens wildlife enforcement

legislation; and also provides for better management of Areas of Outstanding Natural Beauty (AONB).

## Policy Context

### National and Regional Planning Policy

#### Planning Policy Wales (PPW) Edition 8 (2016)

**13.2.8** Planning Policy Wales (PPW) Edition 8 (2016) sets out the land use planning policies of the Welsh Government. PPW provides advice on a wide range of issues and is supported by a number of Technical Advice Notes (TANs). PPW guides local planning authorities to promote development that is easily accessible by public transport, cycling and walking, although in rural areas required development might not be able to achieve all accessibility criteria in all circumstances. Objectives for transport (including walking and cycling) are set out in Chapter 11 Tourism, Sport and Recreation.

**13.2.9** A key PPW objective relating to Community Facilities states that local development plans (LDP's) should promote access to employment, shopping, education, health, community, leisure and sports facilities and open and green space, maximising opportunities for community development and social welfare (PPW, para. 4.4.3). It should be noted that the assessment of the Scheme on Community and Private Assets is outlined in Chapter 14 of this ES.

#### Draft Mid Wales Regional Transport Plan (2015)

**13.2.10** The Mid Wales Regional Transport Plan (RTP) is a statutory plan covering the area which sets out an integrated and sustainable transport strategy for Mid Wales. The RTP aims to provide a modern, accessible, integrated and sustainable transport system for Mid Wales and protects the environment where walking, cycling and public transport provide real travel alternatives.

#### Road Safety Framework for Wales (2013)

**13.2.11** This supersedes the Road Safety Strategy, which successfully achieved and exceeded the targeted reductions in casualties for all road users in Wales in 2010.

**13.2.12** The 2013 framework sets out the Welsh Government's priorities for road safety and focuses on casualty reduction targets. Compared to the averages for 2004-2008 its targets are:

- 40% reduction in the total number of people killed and seriously injured on Welsh roads by 2020;

- 25% reduction in the number of motorcyclists killed and seriously injured on Welsh roads by 2020; and
- 40% reduction in the number of young people (aged 16-24) killed and seriously injured on Welsh roads by 2020.

### Walking and Cycling Strategy for Mid-Wales (2012)

**13.2.13** Transport Research and Analysis Computing Center (TRACC) published the Walking and Cycling Strategy for Mid-Wales in 2012. The overarching aim is to invest in walking and cycling projects and initiatives in order to achieve the following:

- Improve the health and wellbeing of Mid Wales residents;
- Reduce car use and carbon and other environmental impacts of travel;
- Improve accessibility to and between key settlements, public transport interchanges, employment, education, services and facilities;
- Encourage economic development through enhancing tourism, leisure and recreation infrastructure; and
- Influence travel decisions of present and future transport users through land use planning and travel behaviour initiatives.

### TAN 16 ‘Sport, Recreation and Open Space’ (2009)

**13.2.14** TAN 16 provides technical guidance in relation to sport, recreation and open space to supplement policy set out in PPW. In relation to PRow, the contribution of safe footpaths and cycle routes is highlighted, as is the need to protect and maintain these recreational and tourist resources.

### TAN 18 ‘Transport’ (2007)

**13.2.15** TAN 18 (Welsh Assembly Government, 2007) encourages an efficient and sustainable transport system as a requirement for modern society. It states that to achieve a more sustainable pattern of development it is necessary to understand the interactions and linkages between land use and transport and devise integrated strategies, objectives and policies at the national, regional and local levels.

**13.2.16** In terms of ‘active travel’ TAN 18 aims to:

- ensure new development is located where there is, or will be, good access by public transport, walking and cycling thereby minimising the need for travel and fostering social inclusion; and

- promote cycling and walking.

### People, Places, Futures – The Wales Spatial Plan (2008)

**13.2.17** The Wales Spatial Plan (WSP) was originally adopted in 2004 as the 20 year plan for sustainable development in Wales. It was updated in 2008 and provides the ‘overarching framework and integration tool for Wales’. It underpins the future improvement of regional and national strategic planning for transport.

**13.2.18** There are five guiding themes which set out the National Framework. The key themes are based on:

- Building sustainable communities;
- Promoting a sustainable economy;
- Valuing our environment; and
- Respecting distinctiveness.

**13.2.19** Among the key challenges identified within the WSP is to integrate sustainable transport solutions with community and development planning to improve accessibility.

### Wales Transport Strategy – One Wales: Connecting the Nation (2008)

**13.2.20** The Wales Transport Strategy (WTS), One Wales: Connecting the Nation, was published in 2008. The document outlines how the transport policy approach is more responsive than previous strategies in its delivery of the Welsh Government’s wider policy agenda, and has attempted to be flexible to reflect different regional circumstances.

**13.2.21** The four main regions in Wales are each represented by a regional transport consortium, which has been created through partnerships between neighbouring Local Authorities.

**13.2.22** The stated goal of the strategy is for Wales to promote sustainable transport networks that safeguard the environment, while strengthening Wales’ economic and social life. The transport strategy identifies a series of high-level sustainable transport themes and sets out the steps to their delivery, including:

- Achieving a more effective and efficient transport system;
- Achieving greater use of the more sustainable and healthy forms of travel; and
- Minimising demands on the transport system.

## Local Planning Policy

### Powys County Council Rights of Way Improvement Plan (2007)

**13.2.23** Powys County Council (PCC) published its first Public Rights of Way Improvement Plan (PROWIP) in 2007.

**13.2.24** Under Section 60 of the Countryside and Rights of Way Act 2000 (the 'CROW' Act), every local authority is required to prepare and publish a Rights of Way Improvement Plan for the management, provision and promotion of the PRoW in their areas. The aims of each plan are to extend the network and improve the connectivity of the routes, to improve accessibility for all users and to improve local awareness of the PRoW Network within each area.

**13.2.25** Powys County Council's PROWIP states a series of 10-year objectives based on the following aims:

- Condition of the PRoW Network;
  - To have an open, easy to use and well-signed PRoW network;
  - Effectively manage, monitor and maintain opened paths in a satisfactory condition;
- Management and Enforcement of PRoW and Access Land
  - Take all reasonable steps to improve access for all;
  - Identify and develop local circular routes around settlements;
  - Improve and increase access onto and across Access Land;
  - Ensure the long-term success of the recreational trails in Powys;
- Definitive Map and Statement;
  - Achieve an accurate and up-to-date Definitive Map and Statement;
  - Make the Definitive Map and Statement widely available in appropriate formats;
- Publicity and Promotion;
  - Increase the range and quality of public information in a variety of formats.

### **Powys Unitary Development Plan (2001 – 2016)**

**13.2.26** The Unitary Development Plan (UDP) sets out the principles for development in Powys until 2016. It provides a basis for making decisions on planning applications and where certain types of development should or should not be allowed. The UDP contains policies of relevance, addressing traffic management, walking, cycling and rights of way.

### **Eryri Local Development Plan 2007 – 2022 (adopted in July 2011)**

**13.2.27** The Local Development Plan (LDP) for Snowdonia National Park Authority was formally adopted on 13th July 2011. The Local Development Plan contains strategic policies and development policies which will deliver the long term spatial vision for the future of Snowdonia National Park.

**13.2.28** Strategic Policy L: Accessibility and Transport details the National Park Authority's commitment to improving access to local facilities and reduce the need to travel, especially by private car.

**13.2.29** Development will be supported where:

- a) The provision of services are located so as to minimise the need to travel;
- b) There is convenient access via footpaths, cycle paths and public transport, thereby encouraging the use of these modes of travel for local journeys, thus reducing the need to travel by private car and improving the accessibility of services to those with poor availability of transport;
- c) There is an improvement in accessibility for all, in particular disabled people;
- d) Changes to the road network do not damage or cause detrimental effects to PRow, listed buildings, historic monuments or cause adverse effects to environmental designations. The highest priority will be given to the conservation and enhancement of the characteristic biodiversity of Snowdonia, particularly habitats and species designated under national and European legislation. Where possible, these improvements to the road network will feature provision for segregated pedestrian and cycling uses;
- e) It will reduce or remove vehicle traffic from within town centres and where possible from rural areas;
- f) The natural environment of the park is not adversely affected; and

- g) Secure cycle parking facilities are provided where appropriate.

## Relevant Guidance

- 13.2.30** The assessment has taken into consideration the following guidance:
- Interim Advice Note 125/09(W) Supplementary guidance for users of DMRB Volume 11 ‘Environmental Assessment’;
  - DMRB Volume 11, Section 3, Part 8 – Pedestrians, Cyclists, Equestrians and Community Effects; and
  - DMRB Volume 11, Section 3, Part 9 - Vehicle Travellers.
- 13.2.31** The assessment topic of ‘Effects on All Travellers’ was introduced into standard highway environmental assessment guidance in Wales through IAN 125/09(W). The new topic combines some guidance from DMRB Volume 11, Section 3, Part 8, Pedestrians, Cyclists, Equestrians, and Community Effects with guidance in DMRB Volume 11, Section 3, Part 9, Vehicle Travellers. Due to guidance changes resulting from IAN 125/09(W) the recreational facilities assessment now form part of the ‘Community and Private Assets’ (Chapter 14) assessment.

## 13.3 Study Area

- 13.3.1** DMRB guidance does not specify a standard study area for the assessment of effects on all travellers. However, the guidance references the requirement to identify existing and proposed PRoW which may be affected by the Scheme, particularly those associated with access to key community facilities.
- 13.3.2** The study area includes all PRoW and local roads which meet or cross the scheme, including the existing Pont-ar-Ddyfi. In addition, any other key routes, such as cycleways and bridleways, to trip generators has been included in the study area if there is potential for such routes to be affected. There is one survey location to the south of Pont-ar-Ddyfi in order to note travellers who do not use the riverside path and continue along the A487 or turn onto the A493. Refer to Volume 2 Figure 13.1 Non-Motorised Users Routes which outlines the study area within a 1km and 500m buffer.
- 13.3.3** DMRB guidance does not specify a standard study area for assessment of the effects on community severance. However, the guidance references the requirement to establish local travel patterns and identification of key community facilities and their catchment areas. It is also important to note that Chapter 16 outlines the assessment of the Scheme on Community and

Private Assets. Community facilities have been considered within approximately 1km of the scheme in order to capture the likely effects of the Scheme from severance to access. The assessment has focused on communities which would be directly affected by the scheme and Machynlleth is the nearest town within 1km of the Scheme, refer to Volume 2 Figure 13.2 Community Facilities.

**13.3.4** The local study area includes all residences and businesses along the existing A487 and the proposed route and also communities in the immediate surrounding area that contain facilities which are assumed to be used by local residents.

**13.3.5** The study area for vehicle travellers consist of the main routes in and out of Machynlleth which includes the A487 to Aberystwyth, existing A487/A493 and A487 to Porthmadog and the new Pont-ar-Ddyfi route within a 1km buffer of the Scheme.

## **13.4 Methodology**

**13.4.1** 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 125/09(W) therefore advises that existing methodologies in relation to Pedestrians, Cyclists, Equestrians and Vehicle Travellers are used.

### **Identification of Baseline**

**13.4.2** The following data sources have been used to identify community facilities and routes used by NMUs and motorists:

- A487 Fishguard to Bangor Trunk Road Pont-ar-Ddyfi Stage II Environmental Assessment (2002) Volumes I, II and III;
- Ordnance Survey (OS) mapping;
- Definitive Maps of PRow;
- Ordnance Survey (OS) MasterMap Address Layer data<sup>1</sup>;
- OS Points of Interest data;
- Sustrans web based data at [www.sustrans.org.uk](http://www.sustrans.org.uk);
- Powys Unitary Development Plan 2001 – 2016;
- Consultation with the local authorities on cycleways, PRow and footpaths within the Scheme area; and
- Review of Non-Motorised Users Surveys undertaken by Arup between September and October 2015. The full NMU report is included within Appendix 13.1. The findings of the

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<sup>1</sup> It should be noted that OS data was one package that was examined for three different types of information.

NMU report contribute to the assessment of impacts on NMUs in this Chapter; and

- Establishing the existing view from the road and identifying existing factors which contribute to driver stress when travelling along the road.

## Methodology for Construction and Operation Effects

**13.4.3** A qualitative and quantitative assessment of effects due to construction and operation upon all travellers was undertaken following the guidance of DMRB Volume 11, Section 3, Parts 8 and 9. The assessment of effects for both scenarios is based upon the same qualitative and quantitative methodology.

**13.4.4** The assessment of the Effects on All Travellers includes the assessment on the following effects:

- construction/operation effects upon driver's 'View from the Road';
- construction/operation effects upon 'Driver Stress';
- construction/operation effects on community severance; and
- construction/ operation effects on non-motorised users.

## Vehicle Travellers

**13.4.5** The assessment of effects upon vehicle travellers considered the following factors:

- Effect of construction/operation upon driver's 'View from the Road'; and
- Effect of construction/operation upon 'Driver Stress'.

**13.4.6** Both the assessment of effects due to construction and operation have considered the potential for the creation of new severance as a result of the Scheme.

**13.4.7** Bus travellers, as receptors, are not covered in detail in the DMRB guidance. However, these receptors are considered in terms of their physical access to bus services and how the Scheme may affect access to these services. It is recognised that people who travel by bus usually undertake part of their journeys by other modes such as by foot, bicycle or car. There is no standard guidance of applying a value to the receptors for this topic. Reference has been made to Section 13.2.4 for the general DMRB Volume 11 approach applied in this assessment.

## View from the road

**13.4.8** Traveller views are defined as the extent to which travellers, including drivers, are exposed to different types of scenery which the route passes through. The assessment considers landscape character and potential views, good or bad, along the route.

## Driver Stress

**13.4.9** Driver stress is defined in DMRB Volume 11, Section 3, Part 9 as *“the adverse mental and physiological effects experienced by drivers traversing a road network”*. Driver stress is affected by a number of factors, including: road layout and geometry, surface riding characteristics, junction frequency, traffic speed and flow per lane characteristics. Collectively these factors can induce feelings of discomfort, annoyance, frustration and fear, in drivers, resulting in physical and emotional tension which detracts from the value and safety of the journey. Driver stress has the following components:

- Frustration, associated with a driver’s inability to drive at a consistent speed, such as the speed limit (due to congestion), with frustration increasing as traffic speeds fall, or at junctions and road works. This could also apply to the journey time reliability mentioned above, and the experience of drivers being caught in severe congestion;
- Fear of potential accidents, which may be associated with the presence and proximity of other vehicles, inadequate sight and stopping distances, poor lighting, road works and poor surfacing, with feelings compounded during adverse weather; and
- Route uncertainty, primarily associated with inadequate signing and information.

**13.4.10** The extent of stress induced in individual drivers differs greatly due to their level of skill, experience, temperament, knowledge of the route and state of health.

## Non-Motorised Users

**13.4.11** Pedestrians, cyclists and equestrians are sometimes referred to collectively as non-motorised users (NMUs). These travellers may make their journeys for utility (e.g. commuting to work) or recreational purposes. NMUs also include people with mobility problems who may have needs that differ from those of other pedestrians.

**13.4.12** Amenity is defined in DMRB Volume 11, Section 3, Part 8 as ‘the relative pleasantness of a journey’ (paragraph 4.1) and changes to the amenity of journeys undertaken by pedestrians, equestrians and cyclists may include exposure to and distance

from traffic, visual and noise intrusion, together with the quality of NMU routes including street furniture, planting and signage.

## Community Severance

**13.4.13** Community severance is defined in DMRB Volume 11, Section 3, Part 8 as *‘the separation of residents from facilities and services they use within their community caused by new or improved roads or by changes in traffic flows’* (paragraph 5.2). The methodology adopted for the assessment of community severance follows the guidance set out in this section of the DMRB. The DMRB Volume 11, Section 3, Part 8 states that the assessment of community severance should be undertaken for the opening year of the Scheme and should take into account the following:

- The direct effects of the Scheme and any increases in traffic levels on other roads;
- The number of people whose journey would be affected, their location and the community facilities from which they would be severed;
- The presence of particularly vulnerable groups such as children, the aged and the disabled;
- The type of road involved; and
- The provision of mitigation.

**13.4.14** These guidelines apply specifically to any increases in the length of journeys of pedestrians. The DMRB states that *‘cyclists and equestrians are less susceptible to severance because they can travel more quickly than people on foot, although they may still be deterred from making journeys which require them to negotiate additional roads and especially junctions’*.

**13.4.15** The guidance states that new severance should be described using a three point scale of Slight, Moderate or Severe severance as follows:

- **Slight:** In general the current journey pattern is likely to be maintained, but there will probably be some hindrance to movement;
- **Moderate:** Some residents, particularly children and elderly people, are likely to be dissuaded from making trips. Other trips will be made longer or less attractive; and
- **Severe:** 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.

## Significance Criteria for Vehicle Travellers

### Driver Stress

**13.4.16** 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.

**13.4.17** The DMRB guidance in relation to Vehicle Travellers (Volume 11, Section 3, Part 9, Chapter 4) 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 13.1). The guidance states that the assessment should be made for the worst year in the first fifteen after opening.

Table 13.1: Single-carriageway roads

Average peak hourly flow per lane, in flow Units/1 hour	Average Journey Speed Km/hr		
	Under 50	50 - 70	Over 70
Under 600	High <sup>2</sup>	Moderate	Low
600 – 800	High	Moderate	Moderate
Over 800	High	High	High

**13.4.18** Please refer to Table 13.8 within Section 13.5 which outlines the seven-day 85 percentile of the 24h directional vehicle speeds. The results show that the seven day average speeds are similar for both directions and these results were used support the Driver Stress analysis.

### Views from the Road

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

- 'no view' (the road is deep in a cutting);
- 'restricted view' (frequent cutting or structures cutting the view);

<sup>2</sup> Moderate in 'urban' areas

- 'intermittent view' (road at ground level but with shallow cuttings or barriers at intervals); and
- 'open view' (the view extending over many miles).

**13.4.20** These categories have been determined to provide an assessment of the surrounding landscape (the view beyond the confines of the highway), not the road or roadside infrastructure itself (gantries, bridges, signage), which only temporarily affects views.

**13.4.21** 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 been effective in visual mitigation, for further details on visual mitigation refer to Section 8.7 of Chapter 8 Landscape and Visual. 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 the southern end of the Scheme within the 30mph speed limit. 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.

### Significance Criteria for Severance

**13.4.22** The tables below describe the magnitudes of impact for severance (Table 13.1). This is based on the criteria in DMRB Volume 11, Section 3 Part 8 (June 1993). Table 13.2 describes the magnitudes of impact for the beneficial effects for the improvements to PRow as a result of the Scheme. This is based on the criteria used in a number of WelTAG (Welsh Government, 2008c) appraisals for transport studied in relation to Physical Fitness.

**13.4.23** The definitions of magnitude of impacts are described in Table 13.2 and Table 13.3 below.

Table 13.2: Impact Magnitude for Severance

<b>Magnitude of Impact</b>	<b>Description</b>
Major	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.
Moderate	Some residents, particularly children and elderly people, are likely to be dissuaded from making trips. Other trips will be longer or less attractive.
Minor	In general the current journey pattern is likely to be maintained, but there will probably be some hindrance to movement.
Negligible	Low importance - Receptors with low sensitivity to traffic flows and those sufficiently distant from affected roads and junctions
No change	No loss or alteration of characteristics, features or elements; no observable impact in either direction.

Table 13.3: Impact magnitude for beneficial effects from improvements to PRow

Magnitude of Impact	Description
Major	Scheme is expected to substantially increase travel by active modes
Moderate	Scheme is expected to moderately increase travel by active modes
Minor	Scheme is expected to slightly increase travel by active modes
Negligible	Very minor increases to travel by active modes
No change	No increase in travel by active modes

**13.4.24** Table 13.4 below describes the NMU Receptor sensitivity used within this assessment.

Table 13.4: NMU Receptor sensitivity

Receptor sensitivity	Description
Very High	Very high importance and rarity, international scale and very limited potential for substitution
High	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)
Medium	Pedestrian, cyclist or equestrian routes that are used as a registered Public Right of Way or as part of popular recreational trail
Low	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
Negligible	Very low importance and rarity, local scale

**13.4.25** Table 13.5 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.

Table 13.5: Significance of Impact

Value / Sensitivity	Magnitude of Impact				
	No change	Negligible	Minor	Moderate	Major
Negligible	Neutral	Neutral	Neutral or slight	Neutral or slight	Slight
Low	Neutral	Neutral or slight	Neutral or slight	Slight	Slight or Moderate
Medium	Neutral	Neutral or slight	Slight	Moderate	Moderate or Large
High	Neutral	Slight	Slight or moderate	Moderate or Large	Large or Very Large
Very High	Neutral	Slight	Moderate or large	Large or Very Large	Very Large

## Consultation

**13.4.26** Table 13.6 below summarises all the consultation to date with stakeholders or consultees.

Table 13.6: Consultation Responses Relevant to Effects on All Travellers

Date	Consultees and Issue Raised	How/Where Addressed
26 November 2014 - Environmental Liaison Group Meeting 1	<p>Sustrans raised a concern over the long term maintenance of the existing Pont-ar-Ddyfi as this is used as a pedestrian and cycle route</p> <p>Sustrans noted that the Active Travel Act places a duty on LA's and WG to enhance provision for pedestrians and cyclists. Therefore the Active Travel Act needs to be an essential part of the scheme with the cross-section of the road designed to accommodate cyclists and pedestrians.</p> <p>NCN Route No. 8 which runs along the south side of the Dyfi, an existing right of way, is not fenced off to allow cattle access to the river. There are also a number of gates across the right of way because of this. Regular cyclists (mainly to the Centre of Alternative Technology) use the A487 as it is more direct route and with no gates.</p> <p>Walking and cycling on the new road would be more direct, have an even gradient, be more comfortable with no gates and more convenient for regular use. The existing walking and cycling route involves 5 gates over approximately 600m – landowner will not permit removal, also animal waste on path.</p>	<p>Part of the existing A487 would be closed to traffic and its trunk road status removed during the operation stage. This along the Pont-ar-Ddyfi would provide safe pedestrian access along the Wales Coast Path and cyclist access along the NCN Route 8.</p> <p>The Active Travel Act 2013 has been addressed in Section 13.2.2, Section 13.2.32 and Section 13.10.9.</p> <p>This assessment has considered the effect of the Scheme on the NCN Route No.8 along south bank of Afon Dyfi and along the A487 at the northern and southern sections of the Scheme.</p> <p>A new walking and cycling path along the viaduct has been considered within this assessment.</p>
16 September 2015 – Environmental	Sustrans noted that DMRB guidance is outdated for pedestrian and cycle users	See Section 13.2.2

Date	Consultees and Issue Raised	How/Where Addressed
Liaison Group meeting 2	and to look to use a different set of guidance e.g. Active Travel Design Guidance, Active Travel (Wales) Act 2013	See Section 13.2.32  See Section 13.10.9
19 January 2016 – Environmental Liaison Group Meeting 3	Sustrans noted that the creation of a shared use cycle and pedestrian path is currently outside the scope of this Scheme.	The existing signposted formal NMU routes (i.e. over Pont-ar-Ddyfi, along the southern river bank, and over Millennium footbridge) will be largely unchanged by the scheme. The Scheme will accommodate a shared footway/cycleway on the new viaduct.
9th August 2016 - Environmental Liaison Group Meeting 4	Welsh Government asked where the new request bus stop will be located as the existing bus request stop is south of the existing Pont-ar-Ddyfi. WG suggested discussions should take place with bus companies. WG asked how often is this existing bus request stop used.	Section 13.5.41 states that bus stops in the vicinity of Pont-ar-Ddyfi operate as request stops, with no signage or carriageway demarcations. Consultation with Lloyds Coaches revealed that outside of town centres, many of the buses operate on a hail and ride type service, with few bus stops demarcated with timetables or shelter provision. However, there are some locations that are recognised as bus stops, due to frequency of use and/or layby formation.  Section 13.5.39 states Table 13.9 summarises the bus services and their routes that serve the bus stops in the immediate vicinity of Pont-ar-Ddyfi. The frequency of most services is approximately 1-2 per

Date	Consultees and Issue Raised	How/Where Addressed
		hour during the weekday daytime.
2 December 2016	Lloyds Coaches	<p>Alun Griffiths held a meeting with Lloyds Coaches to discuss the impacts on the bus request stops within the vicinity of the Scheme.</p> <p>It was confirmed that there are no bus stops affected by the scheme and there are no request stops near the existing bridge and the scheme will not affect the current bus services. These services run west to Tywyn and various services going north to Aberllefenni, Dolgellau and Bangor.</p> <p>Lloyd's also do the school runs and there is a collection/pick up located at a lay bye on the B4404 just off the A487 and the same children are dropped off on the A487 at the A487/B44044 junction.</p>

## Limitations and Assumptions

- 13.4.27** During the baseline research and consultation activities, it was established that there is limited equestrian activity along the A487, Pont-ar-Ddyfi and no bridleways within the vicinity of the Scheme. Therefore the effects on equestrians are considered to be negligible and have been scoped out of this assessment.
- 13.4.28** The assessment of the 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. Where subjective assessments are presented below, attempts to reconcile against evidence have been made throughout.
- 13.4.29** The DMRB Volume 11, Section 3, Part 8 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 set out 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, have not altered.

- 13.4.30** Relief from existing road severance has not been assessed as it is not significant where traffic flows are already relatively low as stated in the DMRB guidance. The guidelines do not apply to roads with an existing Annual Average Daily Traffic (AADT) flow of less than 8,000 vehicles (two way flow). Therefore only severance of cycleways and pedestrian paths are assessed in this Chapter.
- 13.4.31** The assessment relies, in part, on data provided by third parties (e.g. local authorities, NRW) which are the most up to date, available at the time of the assessment. No significant changes or limitations in these datasets have been identified that would affect the robustness of the assessment for EIA purposes.
- 13.4.32** It should be noted that the NMu counts were undertaken during October half term school holidays from Sunday 25<sup>th</sup> October to Tuesday 27<sup>th</sup> October 2015 (inclusive), between 8am and 4pm. Therefore potentially no children travelling to school and fewer people may commute to work during half term holidays due to child care. In addition, as the NMu counts were taken in autumn more people may be inclined to travel by car.

## **13.5 Baseline Environment**

- 13.5.1** The following baseline conditions have been identified.

### **Non-Motorised User (Nmu) Survey**

- 13.5.2** NMu counts were undertaken during October half term school holidays from Sunday 25<sup>th</sup> October to Tuesday 27<sup>th</sup> October 2015 (inclusive), between 8am and 4pm. This recorded NMu type (pedestrian, cyclist, equestrian) and the direction of movement.
- 13.5.3** Two locations were surveyed, as shown on Volume 2 Figure 13.1 NMu Routes. Counts were broken down into 15 minute periods within the overall daily count, allowing for a profile of NMu movements over a daily period. Full results of the NMu counts are included as Volume 3 Appendix 13.1. This includes plans showing the location of the counts.
- 13.5.4** Table 13.7 shows the daily totals for each of the surveyed days.

Table 13.7: 2015 Surveyed NMU Flows

Description		Sunday			Monday			Tuesday		
		Ped.	Cycl.	Total	Ped.	Cycl.	Total	Ped.	Cycl.	Total
Count location 1 – NCN Route 8 crossing A487 south of Pont ar Ddyfi	WB	33	19	52	20	6	26	16	4	20
	EB	24	16	40	15	8	23	8	7	15
	2-way	<b>57</b>	<b>35</b>	<b>92</b>	<b>35</b>	<b>14</b>	<b>49</b>	<b>24</b>	<b>11</b>	<b>35</b>
Count location 2 – NCN Route 8, north of Afon Dyfi Millennium Cycle Bridge	SWB	23	14	37	0	6	6	0	4	4
	NEB	16	14	30	0	8	8	0	7	7
	2-way	<b>39</b>	<b>28</b>	<b>67</b>	<b>0</b>	<b>14</b>	<b>14</b>	<b>0</b>	<b>11</b>	<b>11</b>

**13.5.5** In the Active Travel Act (2013), “*active travel journey*” means a journey made to or from a workplace or educational establishment or in order to access health, leisure or other services or facilities. The majority of these journeys would be made Monday to Friday when these facilities are available.

**13.5.6** It is notable that the surveys at count location 2 on Monday and Tuesday recorded no pedestrian activity, with only a low number of cycle movements observed.

**13.5.7** It would be assumed that the greater number of cyclists on Sunday would be for recreational purposes, not made to or from a workplace or to access health, leisure or other services or facilities. It was also considered that the route would be used more for recreational movements in the school holidays than in the school term.

**13.5.8** Table 13.8 shows the seven-day 85 percentile of the 24h directional vehicle speeds. The results show that the seven day average speeds are similar for both directions.

Table 13.8: Directional Vehicle Speeds

ATC location	Direction	24hr 85%ile speed	Speed limit
Site 1, A487, Machynlleth	Eastbound	32.8	30
	Westbound	32.8	
Site 2, A493, Machynlleth (Bridge Sign)	Eastbound	41.4	60
	Westbound	43.3	
Site 3, A487, Machynlleth (Road Narrows Sign)	Northbound	43.0	60
	Southbound	42.8	
Site 4, A489, Machynlleth	Northbound	44.1	60

**13.5.9** No equestrian activity was observed during the surveyed period.

**13.5.10** The results of the survey show Sunday to be the busiest day at both count locations, with pedestrians as the predominant NMU type. Across the three surveyed days, the NCN Route 8 crossing south of Pont-ar-Ddyfi saw more NMU activity than the NCN Route 8, north of Afon Dyfi Millennium Cycle Bridge.

**13.5.11** It is notable that the surveys on Monday and Tuesday recorded no pedestrian activity at the count location north of Afon Dyfi Millennium Cycle Bridge, with only a low number of cycle movements observed.

## Pedestrians

**13.5.12** A number of walking routes within the vicinity have been identified:

- The Wales Coast Path passes through Machynlleth. The Wales Coast Path is a long-distance footpath which follows, or runs close to, the majority of the coastline of Wales. Within the local area, the route takes a generally north-south direction, crossing the Pont-ar-Ddyfi;
- Glyndŵr's Way is a long distance footpath in mid Wales. It runs for 135 miles (217 km) in an extended loop through Powys between Knighton and Welshpool. The path passes Machynlleth to the southeast; and
- Other notable walking routes are promoted by Natural Resources Wales, which are predominately recreational and circular. Whilst there are numerous routes in the area surrounding Machynlleth, only Glyndŵr's Way passes through the town. No routes cross the Afon Dyfi at Pont-ar-Ddyfi.

**13.5.13** There is way finding provision in terms of signage in the town centre for pedestrians.

## Cyclists

**13.5.14** A number of cycling routes within the vicinity have been identified:

- National Cycle Network Route 8 (NCN 8) - Known as the Lôn Las Cymru, fully open and signed between Cardiff and Holyhead (Anglesey) via Brecon, Builth Wells, Machynlleth, Porthmadog and Bangor. NCN 8 runs along the A487 and across the Pont-ar-Ddyfi;
- National Cycle Network Route 82 (NCN 82) – NCN 82 will run from Bangor to Fishguard when complete. Within the

vicinity of the bridge, the route passes along the A493 and is characterised as an on-carriageway route;

- Eurovelo 2 (EV2) is a 5,500 km long-distance cycling route running from Galway, Ireland to Moscow, Russia. This east-west route passes successively through seven countries — Ireland, the UK, the Netherlands, Germany, Poland, Belarus and Russia and visits all their capital cities. Within the vicinity of Machynlleth, the EV2 follows the NCN Route 8. However, the EV2 route is not designated as either ‘not realised’ or ‘planned’ and thus EV2 is not yet a complete route; and
- Mach 1, 2 and 3 are mountain biking routes of varying length and riding skill levels, which cover the area south of Machynlleth. The routes have no waymarkers, but route maps are available from Dyfi Mountain Biking.

## Existing Travel Patterns

**13.5.15** Due to the rural nature of the study area, there is significantly low pedestrian and cyclist movement. There are several community facilities in Machynlleth as identified within Volume 2 Figure 14.2 Community Facilities, however villages and towns are generally too far apart to encourage walking and cycling. As part of the NMU survey, existing travel patterns were examined and desire lines identified within the study area.

**13.5.16** A desire line is a route created by the demand to connect locations or services such as retail facilities, and local services such as a post office or school.

**13.5.17** There are some desire lines in the Machynlleth area but relatively few that cross Pont-ar-Ddyfi. Desire lines that have been identified are within the town; and are predominantly a west-east movement into the town centre from surrounding residential areas. The rural nature of the area and the absence of towns and villages within walking distance limits number of desire lines beyond the boundary of the town.

**13.5.18** The NMU report has identified a number of ‘trip generators’. Machynlleth in itself is a trip generator, as a tourist attraction and a base from which many explore Snowdonia and the surrounding area. These are varied and include many of the following:

- Places of Worship;
  - St Peters Parish Church;
  - Capel Maengwyn;
  - Saint Mair Catholic Church.

- Supermarkets;
  - Heol Maengwyn Spar and Post Office;
  - The Co-operative.
- Public Houses;
- Bus Stops;
- Railway Station.
  - Machynlleth railway station.
- Schools;
  - Ysgol Bro Ddyfi;
  - Machynlleth Community Nursery;
  - Machynlleth Community Primary School.
- Community centres and facilities;
  - Bro Ddyfi Community Hospital;
  - Machynlleth Health Centre.
- Leisure Centres and Sports Facilities;
  - Machynlleth Bowling Club;
  - Bro Dyfi Leisure Centre.
- Offices and Industrial Employment Sites;
  - Parc Menter Treowain Enterprise Park.
- Long distance footpaths and cycle routes; and
- Forest walks and trails.

**13.5.19** The NMU Contextual Report (Appendix 13.1), shows the locations of all established trip generators.

**13.5.20** A traffic model has been created using a combination of traffic counts undertaken specifically for the project and count data from Welsh Government and Department for Transport. Annual average daily traffic (AADT) flows were calculated for key roads in the model area.

**13.5.21** Table 13.9 below shows baseline traffic figures (AADT 2015) compared with predicted traffic figures for the opening year (AADT 2019). This information is used when assessing impacts in relation to community severance.

Table 13.9: Baseline traffic data compared with predicted opening year traffic data.

Link		2015 AADT	2019 AADT
A493 (west of Pont ar Ddyfi)	Eastbound	1207	1300
	Westbound	1214	1307
	<b>2 way</b>	<b>2421</b>	<b>2607</b>
A487 (north of junction with B4404)	Northbound	1595	1719
	Southbound	1565	1686
	<b>2 way</b>	<b>3160</b>	<b>3405</b>
A487 (south of bridge)	Northbound	2384	2568
	Southbound	2454	2644
	<b>2 way</b>	<b>4838</b>	<b>5212</b>
A489 Heol Maengwyn	Eastbound	3263	2516
	Westbound	3316	3573
	<b>2 way</b>	<b>6579</b>	<b>6089</b>
B4404	Eastbound	199	214
	Westbound	230	248
	<b>2 way</b>	<b>429</b>	<b>462</b>
A487 (south of junction with B4404)	Eastbound	1602	1726
	Westbound	1651	1779
	<b>2 way</b>	<b>3253</b>	<b>3505</b>
A487 (south of junction with A489 Heol Maengwyn)	Eastbound	2529	2724
	Westbound	2632	2835
	<b>2 way</b>	<b>5161</b>	<b>5559</b>

## Vehicle Travellers

**13.5.22** The DMRB assessment of the impact on Vehicle Travellers considers views from the road, driver care and driver stress.

## View from the Road

**13.5.23** The view from the road assessment criteria considers the attractiveness of the road setting from the viewpoint of drivers and passengers. Highways constructed in tunnels or a cut score poorly while highways providing a good view of an attractive urban or rural environment score well. Given the rural nature of the landscape along the length of the Scheme, the new section is considered to be open and attractive.

**13.5.24** Currently, views of the valley from the road are restricted to the section between Pont-ar-Ddyfi and the Dyfi Eco Park. Views from the north of the bridge are severely curtailed by the bridge

parapets and the built environment. Further north as the road rises, roadside vegetation restricts available views.

### Topography

- 13.5.25** The study area is located to the north of Machynlleth within a U-shaped valley with an approximately northeast-southwest orientation. A steep sided rock outcrop rising to 70m AOD defines the southern valley side at Pen yr Allt. Part of the northern face of this hill is a sheer exposed rock face. The outcrop creates a visual separation from the town of Machynlleth, leading to a distinctly rural character within the valley.
- 13.5.26** The valley floor is effectively a flat floodplain and is locally defined on its northern side by the Afon Dyfi. To the east and west of the study area the river meanders across the valley floor. To the east and west, steep topography enclose the flat valley floor.
- 13.5.27** The northern valley side is very steep in its lower slopes (typically 1 in 3 to 5), initially rising to approximately 220m AOD and then beyond to the uplands of Snowdonia National Park (SNP).
- 13.5.28** To the northeast of the study area the steep sided hill of Bryn-coch forms a promontory on the southernmost extent of the uplands beyond.
- 13.5.29** The vegetation pattern within the study area falls into broad forms defined by the valley topography; the valley floor and the valley slopes.

### The Valley Floor

- 13.5.30** The valley floor is laid out in a series of grazed fields. The field pattern follows no particular orientation or form. Boundaries vary from simple wire fences, through fragmented scrubby hedges, to maintained dense hedgerows and significant individual trees. The fields are pasture grassland with isolated marshy areas of juncus grasses.
- 13.5.31** The banks of the Afon Dyfi are vegetated with young trees and scrub. The southern bank is less densely vegetated, although a large bank of gorse defines part of the river corridor.
- 13.5.32** For further information on the agricultural land and farm holdings within the study area, please refer to Section 14.5 of Chapter 14 Community and Private Assets.

### The Valley Slopes

- 13.5.33** The southern outcrop slopes that are not exposed rock comprise a mixture of broadleaf trees, scrub woodland and grazed fields.

The junction of the valley side and floor is marked by a linear pattern of thin trees and scrub.

- 13.5.34** The northern valley side is chiefly under broadleaf woodland, primarily oak with small areas of open grassland breaking up the woodland. Conifer plantations can be seen on the more distant and upper slopes. A character of dense enclosing woodland defines the northern valley side.
- 13.5.35** The isolated hill of Bryn-coch to the east contrasts with the rest of the northern slopes where there are open grazed slopes with little boundary vegetation.

### Driver Stress

- 13.5.36** The DMRB guidance describes driver stress as *'the mental and physiological effects experienced by a driver traversing a road network'*.
- 13.5.37** There are sections on this route where driver frustration is easily induced. The narrowness of Pont-ar- Ddyfi often results in drivers being forced to stop and wait for oncoming traffic to clear the structure. By far the greatest driver frustration can occur during flood conditions when passage across the river is made impossible by severance due to flooding. Uncertainty on the existing route is considered to be low. Overall driver stress on this section of the existing A487 trunk road is considered to be high.

### Public Transport

- 13.5.38** Table 13.10 summarises the bus services and their routes that serve the bus stops in the immediate vicinity of Pont-ar-Ddyfi. The frequency of most services is approximately 1-2 per hour during the weekday daytime.

Table 13.10: Bus Service Summary

Route No.	Frequency (buses per day)			Route
	Monday – Friday	Saturday	Sunday	
34	9	9	-	Machynlleth - Corris - Aberllefenni
34A (extension to 34)	8	-	-	Machynlleth - Cae Crwn
T2	6	6	3	Bangor - Dolgellau - Machynlleth - Aberystwyth
X27	4	6	-	Machynlleth – Corris – Dolgellau

Route No.	Frequency (buses per day)			Route
	Monday – Friday	Saturday	Sunday	
X28/29	6	5	-	Llanegryn - Tywyn - Machynlleth - Aberystwyth
X26/X85	6	5	-	Machynlleth - Newtown

- 13.5.39** Consultation with Lloyds Coaches confirmed there are no request bus stops within the vicinity of the Scheme. Outside of local town centres, many of the buses operate on a hail and ride type service, with few bus stops demarcated with timetables or shelter provision. However, there are some locations that are recognised as bus stops, due to frequency of use and/or layby formation.
- 13.5.40** Consultation with Lloyds Coaches also revealed that the bus company undertake school runs and there is a collection/pick up located at a layby on the B4404 just off the A487 with drop-off on the A487 at the A487/B44044 junction.
- 13.5.41** The nearest bus stops with timetable information are located at Lloyds Coaches Bus Depot, at the northbound and southbound stops, approximately 700m south of Pont-ar-Ddyfi.
- 13.5.42** Machynlleth railway station, on the Cambrian Line, is located approximately 600m south of Pont-ar-Ddyfi and is managed by Arriva Trains Wales. Typical daytime frequencies and journey times to key nearby and long distance destinations are outlined in Table 13.11. These are listed in order of journey time duration.

Table 13.11: Services from Machynlleth railway station

Destination (direct trains from Machynlleth)	Service frequency (trains per day)			Journey time duration
	Monday – Friday	Saturday	Sunday	
Aberdovey	8	8	1	18 minutes
Aberystwyth	16	15	13	34 minutes
Newtown	12	12	8	36 minutes
Barmouth	8	8	1	63 minutes
Shrewsbury	12	12	8	73 minutes
Harlech	8	8	1	89 minutes

- 13.5.43** In addition, to the passenger services operating from Machynlleth railway station, a preserved railway line known as Corris Railway operates as a visitor attraction, some 6km north of Pont ar Ddyfi. The track totals 0.75 miles in length, so is not considered a form of passenger transport, but is recognised as a trip generator.

## **13.6 Assessment of Potential Construction Effects on All Travellers - Before Mitigation**

### **Non-Motorised Users**

- 13.6.1** During construction phase, the following NMU routes listed in Table 13.12 would be affected.

Table 13.12: Construction impacts on NMUs without mitigation

Receptor	Description of impact	Sensitivity	Magnitude	Significance	Comments
NMU route along National Cycle Network 8 / B4404 Receptor location 1 on Figure 13.1 in Volume 2	Noise, dust and visual impact from construction vehicles could impact the amenity of NMUs using the route	Medium	Minor	Slight adverse	NMU access along NCN8 / B4404 shall be maintained during the construction phase. Construction activity may generate noise and dust and visual impact from construction vehicles and activity which could impact on the amenity of PRow.
NMU route along NCN 80/82/A493 Receptor location 2 on Figure 13.1 in Volume 2	Construction activity may generate noise and dust and visual impact from moving construction vehicles could impact on the amenity of NMU route	Medium	Minor	Slight adverse	The NCN route 80/82 route is used for organised bike rides. The NCN Route does provide a frequently used access into Machynlleth, to the station and vice versa to Centre for Alternative Technology. NMU route along NCN 80/82/A493 shall be maintained during the construction phase. Construction activity may generate noise and dust and visual impact from moving construction vehicles could impact on the amenity of PRow.
NMU route along footpath along southern side of Afon Dyfi Receptor location 3 on Figure 13.1 in Volume 2	Construction activity may generate noise and dust and visual impact from moving construction vehicles could impact on the amenity of NMU route	Medium	Minor	Slight adverse	The NMU route is part of the NCN 8 and is a frequently used destination point and subsequently to Centre of Alternative Technology (CAT). NMU access along footpath along southern side of Afon Dyfi shall be maintained during the construction phase. Construction activity may generate noise and dust and visual impact from moving construction vehicles could impact on the amenity of PRow.
NMU route access along A487 south of Pont-ar-Ddyfi Receptor location 4 on Figure 13.1 in Volume 2	Construction activity may generate noise and dust and visual impact from moving construction vehicles	Medium	Minor	Slight adverse	The NMU route is a long-distance footpath used for organised walks. This route is infrequently used for commuting to Machynlleth. Access to the route along A487 south of Pont-ar-Ddyfi shall be maintained during the construction phase. Construction activity may generate noise and dust and visual impact from

Receptor	Description of impact	Sensitivity	Magnitude	Significance	Comments
	could impact on the amenity of NMU route				moving construction vehicles could impact on the amenity of PRoW.
A487 North of the Cambrian Railway Bridge where the A487 is moved to the west of the existing on to embankment (Ref 5 on Figure 13.1 Volume 2)	Severance of cycle route.	Medium	Minor	Slight adverse	North of the Cambrian Railway line the new A487 is to be constructed on embankment extending into the fields to the west of the existing road. There will be a link road to connect with the existing Pont ar Ddyfi where the NCN8 is to be realigned and maintained. There will be significant construction work within this area with services diversions, earthworks and roadworks operations.
South of the Millennium Cycle Bridge where the proposed new viaduct crosses the NCN 8 (Ref 6 on Figure 13.1 Volume 2)	Severance of cycle route.	Medium	Minor	Slight adverse	Where the proposed new viaduct crosses the existing footway/cycleway it will be necessary to construct a temporary diversion through and around the construction site. This would hinder pedestrian journeys and potentially increase journey lengths during the construction phase.
North of the Millennium Cycle Bridge where the NCN8 runs adjacent to the proposed north abutment and tie in with the A487 at Y Ffridd (Ref 7 on Figure 13.1 Volume 2)	Severance of cycle route.	Medium	Moderate	Moderate Adverse	North of the Millennium Cycle Bridge the NCN8 runs close to the area of the proposed new northern abutment. Construction work is likely to interfere with the footway/cycleway local diversions will be constructed or there will be manual control installed so as to maintain safe travel. This would potentially hinder pedestrian journeys and potentially increase journey lengths during the construction phase.

## Vehicle Travellers - Views from the Road

- 13.6.2** Construction activities including vegetation clearance, earthworks and roadworks to the Scheme, will be partially visible for vehicle road travellers. However there will be a large temporary works platform (approx. 20m x 80m) for construction at the push launched sections of viaduct. This would be very visible from the existing road during construction, refer to Appendix 8.3 Visual Assessment in Volume 3 for further detail.
- 13.6.3** As part of the construction of the Southern end of the viaduct section of the development, piling rigs and cranes are likely to be noticeable and dynamic features in this view. These changes will be seen in the context of the existing road and the adjacent built form of the Dyfi Eco Park. Changes arising from these aspects of the construction phase will occupy a small and middle distant proportion of these views, and will contrast slightly with their character.
- 13.6.4** Construction activities associated with the de-trunking of the Pont-ar-Dyfi will include minor works to the road surface and kerb lines to reconfigure the junction at its northern end. These works will be seen at close quarters and will potentially dominate views but only for a short period of time towards the end of the construction phase, refer to Appendix 8.3 Visual Assessment in Volume 3 for further detail.
- 13.6.5** All of the above changes will be **temporary, short term minor adverse and reversible**.

## Vehicle Travellers - Driver Stress

- 13.6.6** In sections where the Scheme would tie into the existing A487 at the northern and southern ends of the Scheme, construction impacts would have a moderate impact on driver stress due to increased frustration from increased congestion due to construction traffic. In addition, the construction of the raised build-outs as part of the traffic calming measure along the A493 at Pen-y-Bont cottages would have a moderate impact on driver stress due to increased frustration from increased congestion due to construction traffic.
- 13.6.7** Assuming no mitigation, the construction works would cause moderate disruption to drivers and road safety from construction traffic. The construction impacts on driver stress would be **moderate adverse**.

## Bus Travellers

- 13.6.8** Journey times for bus services within the vicinity of Pont-ar-Ddyfi will likely be temporarily unreliable as a result of road works and associated traffic delays. These impacts could potentially be **moderate adverse** if people are unable to get to important destinations on time, for example for hospital appointments, school, college or work.

## Community Severance

- 13.6.9** During construction, the majority of NMU routes will be maintained. However, there would be temporary impacts on public rights of way and cycle routes that would hinder pedestrian journeys and potentially increase journey lengths during the construction phase as set out in Table 13.12. Taking these factors into account, the predicted environmental construction effects on community severance are assessed, using the DMRB three point scale, as **moderate adverse** i.e. some residents may be dissuaded from making trips and some trips would be made longer or less attractive.

## 13.7 Assessment of Potential Operational Effects on All Travellers - Before Mitigation

### Non-Motorised Users

- 13.7.1** Table 13.13 below outlines the assessment of operational effects of the Scheme on non-motorised user routes without mitigation.

Table 13.13: Operational impacts on NMU Routes prior to mitigation

Receptor	Description of impact	Sensitivity	Magnitude	Significance	Comments
NMU route along National Cycle Network 8 / B4404 Receptor location 1 on Figure 13.1	No indirect/direct effect on this NMU route	Medium	No change	Neutral	This NMU route will be maintained throughout the operation stage. There will be no change to the amenity or length of the NMU route
NMU route along NCN 80/82/A493 Receptor location 2 on Figure 13.1	A single flow traffic calming measure would be provided along A493 at Pen-y-Bont cottages.	Medium	Moderate	Moderate Benefit	This NMU route will be maintained throughout the operation stage. A single flow traffic calming measure would be provided along the A493 which would also enable a raised footway to be provided along the front of the Pen-y-Bont cottages, and a safer NMU crossing point on the Wales Coast Path and National Cycle Route No.82. The traffic calming measure would have a moderate beneficial effect on the safety of NMUs.
NMU route along footpath along southern side of Afon Dyfi Receptor location 3 on Figure 13.1	Traffic noise from Scheme overhead	Medium	Minor	Slight adverse	The Scheme alignment would be elevated over the existing footpath along south bank of the Afon Dyfi. This might have a minor impact in terms of reducing journey amenity from traffic noise overhead. This impact would have a slight adverse effect on the footpath during the operation stage.
NMU route access along A487 south of Pont-ar-Ddyfi Receptor location 4 on Figure 13.1	Part of the existing A487 would be closed to traffic and its trunk road status removed.	Medium	Moderate	Moderate Benefit	NMU route access along A487 south of Pont-ar-Ddyfi shall be maintained during the operational phase. Part of the existing A487 would be closed to traffic and its trunk road status removed. This section would be along the Pont-ar-Ddyfi. The NCN Route 8

Receptor	Description of impact	Sensitivity	Magnitude	Significance	Comments
					would remain as a cyclepath for cyclists. The Wales Coast Path would remain a footpath for pedestrians. The reduction or complete removal of vehicular traffic from this section would clearly be of Moderate Benefit to cyclists/pedestrians.
A487 North of the Cambrian Railway Bridge where the A487 is moved to the west of the existing on to embankment Receptor location 5 on Figure 13.1	The new A487 north of the Cambrian Railway is to be constructed on an embankment extending into the fields to the west of the existing road.	Medium	Minor	Slight Adverse	Slightly longer journey length of the Wales Coast Path/NCN 8 route at the southern end of the Scheme along the existing A487.
South of the Millennium Cycle Bridge where the proposed new viaduct crosses the NCN 8 Receptor location 6 on Figure 13.1	Traffic noise from Scheme overhead	Medium	Minor	Slight adverse	The Scheme alignment would be elevated over the NCN 8 route. This might have a minor impact in terms of reducing journey amenity from traffic noise overhead. This impact would have a slight adverse effect on the footpath during the operation stage.
North of the Millennium Cycle Bridge where the NCN8 runs adjacent to the proposed north abutment and tie in with the A487 at Y Ffridd Receptor location 7 on Figure 13.1	Traffic noise from Scheme	Medium	Minor	Slight adverse	NCN 8 route would be adjacent to the proposed north abutment and tie in with the A487 at Y Ffridd. This might have a minor impact in terms of reducing journey amenity from traffic noise. This impact would have a slight adverse effect on the NMU route during the operation stage.
Shared footway/cycleway across the new viaduct Shown as the Scheme on Figure 13.1	The scheme would provide a shared footway/cycleway across the new viaduct for NMUs to use	Medium	Moderate	Moderate Benefit	This would have a moderate beneficial effect for pedestrians and cyclists by reducing severance caused by road traffic between residential areas and community facilities and places of employment. This

Receptor	Description of impact	Sensitivity	Magnitude	Significance	Comments
					reduction in severance may encourage increased travel by active modes within the area of Machynlleth.

### Vehicle Travellers - View from Road

- 13.7.2** The Scheme will be dominant in the foreground and middle of the view from the existing A487 south of Pont-ar-Ddyfi. The removal of nearby roadside vegetation will open views up to more of the Scheme in the fields beyond. These changes will be seen in the context of the existing road and the adjacent built form of the Dyfi Eco Park. The Scheme will occupy a large proportion of the lower half of this view with the hills beyond as a backdrop and will visually dominate or intrude upon the view from the road. These changes will be permanent and irreversible. The impact of the Scheme on views from the existing A487 south of Pont-ar-Ddyfi is **large adverse**.
- 13.7.3** At the northern end of the Scheme, drivers will have views of the southern edge of SNP. It is of national importance and visual amenity is of medium value, refer to Volume 3 Appendix 8.3b Visual Assessment for further detail.
- 13.7.4** The Scheme would result in a significant raising of the vertical profile allowing a much more open viewing opportunity to the valley floor landscape and to the wider scenes beyond. The form of the new river crossing and any junction features would serve to provide additional visual interest for vehicle travellers, the operational impact on views from the road would be **moderate beneficial**.
- 13.7.5** Raising of the road profile would open views of the Dyfi Eco Park this is considered to be **neutral**.
- 13.7.6** The existence of a new road will allow more people to see the landscape. Views out from the road provide interest, which may help to alleviate driver stress. These benefits are weighed against the need to mitigate the visual impact of the road itself.

### Vehicle Travellers - Driver's Stress

- 13.7.7** Based on the DMRB guidance for Single Carriageway Roads (refer to Table 13.1), the Scheme is predicted to have moderate driver stress levels as the average speeds would be in excess of 70Kph.
- 13.7.8** The Scheme would reduce driver stress as a result of:
- Reduced frustration, with fewer delays and reduced congestion, due to avoiding repeated flooding from Afon Dyfi of the A487 just south of the bridge, with dangerously high flood water at the Pont-ar-Ddyfi itself;
  - Reduced frustration, with fewer delays and reduced congestion, along A487 and A493 due to reduced flood risk

at Pen-y-Bont cottages from the proposed pumped drainage system;

- Increased driver safety as a result of the single flow traffic calming measure along A493 at Pen-y-Bont Cottages;
- Reduced frustration as a result of the increase in the width of the new carriage in contrast to the existing Pont-ar-Ddyfi, therefore reduced delays from oncoming traffic; and
- Reduced frustration as a result of the improved road surfacing which would reduced spray and noise generation.

**13.7.9** It is assessed that on balance the Scheme would provide a **moderate beneficial** effect on drivers' stress levels.

### Bus Travellers

**13.7.10** There are no bus request stops in the vicinity of the Scheme and current bus services would not be affected by the Scheme therefore there would be a **neutral** effect on bus travellers.

### Community Severance

**13.7.11** During the operational phase, all existing NMU routes would be maintained providing safe access for pedestrians and cyclists. The Scheme would provide a shared footway/cycleway across the new viaduct for NMUs to use. This would ensure that local journeys would be largely unaffected by the operation of the Scheme and that people would not be severed from community facilities. This would have a **moderate beneficial** effect for pedestrians and cyclists by reducing severance caused by road traffic between residential areas and community facilities and places of employment. This reduction in severance may even encourage increased travel by active modes within the area of Machynlleth.

**13.7.12** North of the Cambrian Railway line, the new A487 is to be constructed on an embankment extending into the fields to the west of the existing A487. There will be a link road to connect with the existing Pont ar Ddyfi where the NCN8/Wales Coast Path is to be realigned and maintained. This would slightly increase the journey length of the NMU route. This would have a **slight adverse** effect on pedestrians/cyclists to their journey time travelling to community facilities.

**13.7.13** During the operation stage, part of the existing A487 would be closed to traffic and its trunk road status removed. This section would be along the Pont-ar-Ddyfi. The NCN Route 8 would remain as a cyclepath for cyclists. The Wales Coast Path would remain a footpath for pedestrians. The reduction or complete

removal of vehicular traffic from this section would result in a **moderate beneficial** effect to cyclists/pedestrians travelling to community facilities.

## 13.8 Mitigation

### Construction Mitigation

#### Non-Motorised Users

- 13.8.1** North of the Cambrian Railway line, the new A487 is to be constructed on an embankment extending into the fields to the west of the existing A487 road. There will be a link road to connect with the existing Pont ar Ddyfi where the NCN8 is to be realigned and maintained. The A487 will be restricted to single-way working and the works all carried out in accordance with Chapter 8 of the Traffic Signs Manual (Department for Transport, 2009). These traffic management measures will all be planned and approved and will include provision of both pedestrians and cyclists to travel safely through the construction works.
- 13.8.2** During the construction of the single flow traffic calming measure along A493 at Pen-y-Bont cottages, convoy working or other temporary Traffic Management works would be introduced to avoid complete closure of A493. These traffic management measures will all be planned and approved and will include provision of both pedestrians and cyclists to travel safely through the construction works. However there may be some possible closures required to complete the works.
- 13.8.3** The NCN8 route runs north from the A487 from a point just south of Pont-ar-Ddyfi following the south bank of the Afon Dyfi to join the Millennium Cycle Bridge crossing the river and joining the A487 at Y Ffridd. Where the proposed new viaduct crosses the existing footway/cycleway on the south bank of the Afon Dyfi it will be necessary to construct a temporary diversion through and around the construction site. This diversion route will be constructed to the same specification as the existing route, have a smooth and regular surface, and will be clearly signed and securely fenced off to prevent access to the construction works. Where the footway/cycleway crosses the construction site/haul roads there will be a controlled crossing point to prevent any conflict with construction traffic. This crossing will be manned and have gates to control crossing traffic.
- 13.8.4** North of the Millennium Cycle Bridge the NCN8 route runs close to the area of the proposed new northern abutment. This area of the existing footway/cycleway will be secured with Hera fencing or similar and maintained as far as practicable on the same alignment. Whenever construction works is likely to interfere with

the footway/cycleway local diversions will be constructed or there will be manual control installed so as to maintain safe travel.

- 13.8.5** Nuisance due to noise, dust and visual impacts due to movement of construction vehicles could be partially mitigated through considerate construction management including the use of visual screening (temporary or permanent) and appropriate routing of haul routes. Construction work would be undertaken to specified noise limits and within agreed operational hours, refer to Volume 3 Appendix 17.1 Pre-CEMP.

### Vehicle Travellers - Views from the Road

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

### Vehicle Travellers - Driver's Stress

- 13.8.7** During the construction phase the sections of the Scheme which tie into the existing A487 south of the Pont-ar-Ddyfi and into the existing A487 north of the Afon Dyfi would be subject to construction mitigation in the form of traffic management. The existing A487 road carries significant volumes of vehicles throughout the day and night, however because the majority of the Scheme is being constructed offline conflict will be limited. When work is required online a series of traffic management measures will be implemented including:

- Early construction of realigned A487 at southern and northern ends to move traffic away from construction works and facilitate construction of bridge;
- Single way working of traffic in each direction maintained at all times; and
- Speed restriction in work areas for the safety of road users and the construction workforce. These restrictions will only be introduced when the works commence and will remain until a specific section was complete.

- 13.8.8** A mandatory 40mph (approx.65 kph) speed limit would be imposed where construction occurs in the vicinity of the existing A487. There is likely to be some increase in congestion and queue lengths when construction works take place directly on the existing A487.

- 13.8.9** There could be short term temporary closures that would be imposed, especially when bridge beams are being lifted into place or due to temporary construction works for the single flow traffic calming measure along A493. Diversion routes would be clearly marked and signed during these periods and adequate

notices would be given to road users and local residents via press notices and local newsletter distributions.

### Bus Travellers

- 13.8.10** To mitigate the impact on bus services, early consultation with bus operators, provision of advance travel information for passengers and effective traffic management would be required.

### Community Severance

- 13.8.11** The mitigation measures for public rights of way and cycle routes during the construction phase are set out above.

## Operational Mitigation

### Non-Mortised Users

- 13.8.12** Part of the existing A487 would be closed to traffic and its trunk road status removed during the operation stage. This section would be along the Pont-ar-Ddyfi and would provide safe pedestrian access along the Wales Coast Path and cyclist access along the NCN Route 8.

- 13.8.13** Landscape mitigation measures as outlined in Chapter 8 would consist of the following:

- New hedgerow along the southern edge of the footpath and National Cycle Route 8 at the north eastern end of the Scheme to provide visual screening;
- The addition of trees along existing field boundary hedgerows immediately north and south of the new structure. Once established these will enhance the character of the local landscape and provide visual screening;
- New clusters of woodland at the north eastern edge of the Afon Dyfi, adjacent to the proposed abutment and surrounding the new north eastern junction. Once established this will enhance the character of the local landscape, provide visual screening to pedestrians and cyclists;
- Following the construction works, all embankments will be seeded with a lowland wildflower meadow mix to reinstate the ground cover whilst benefiting wildlife and reducing the maintenance burden; and
- Gravel reinforced earth seeded with grass will be used along the maintenance track running along the south/east side of the viaduct and partly on the north/west side of the viaduct.

This will maintain the character and be visually more attractive than a strip of hard material.

### Vehicle Travellers - Views from the Road

- 13.8.14** The proposed operational mitigation measures are concentrated around the junctions at the northern and southern ends of the Scheme. These include landscape planting and seeding in the form of native scattered trees, hedgerows, small areas of woodland planting, scrub and planting and seeding on embankments and cuttings. Principally designed with the intention of mitigating negative effects and benefiting nature conservation and biodiversity, landscape integration and visual amenity.

### Vehicle Travellers - Driver's Stress

- 13.8.15** Two new pumped drainage systems would be installed at the Cambrian Line Railway Bridge and the Pen-y-Bont cottages which combined with upgraded drainage systems, where appropriate, will address flooding issues in both these areas resulting in reduced delays therefore reducing driver's frustration.
- 13.8.16** Measures such as road layout, signage, and junction arrangements have been designed to minimise driver stress. A single flow traffic calming measure would be provided along A493 which would increase driver safety and reduce driver's stress.
- 13.8.17** There will be street lighting within the 30mph zone south of the viaduct. There will also be some low level parapet lighting along the bridge.
- 13.8.18** The majority of the Scheme would have a national speed limit, although a 30mph speed limit would be provided at the southern end of the Scheme, for approximately the first 200m, reflecting the existing speed limit.

### Bus Travellers

- 13.8.19** No mitigation measures required during the operation stage.

### Community Severance

- 13.8.20** Part of the existing A487 would be closed to traffic and its trunk road status removed during the operation stage. This section would be along the Pont-ar-Ddyfi and would provide safe pedestrian access along the Wales Coast Path and cyclist access along the NCN Route 8.

**13.8.21** Two new pumped drainage systems would be installed at the Cambrian Line Railway Bridge and the Pen-y-Bont cottages which combined with upgraded drainage systems, where appropriate, will address flooding issues in both these areas. This enhancement would allow reliable and safe passage on the A487 for pedestrians and cyclists.

## **13.9 Residual Construction Effects on All Travellers**

### **Non-Motorised Users**

**13.9.1** Table 13.14 below outlines an assessment of construction effects of the Scheme on non-motorised user routes following mitigation.

Table 13.14: Construction impacts on NMU routes following mitigation

Receptor	Description of impact	Sensitivity	Magnitude	Significance	Mitigation	Magnitude (following mitigation)	Significance (following mitigation)	Comments
NMU route along National Cycle Network 8 / B4404  Receptor location 1 on Figure 13.1, Volume 2	Construction activity may generate noise and dust and visual impact from moving construction vehicles could impact on the amenity of NMU route	Medium	Minor	Slight adverse	The use of Best Practicable Means mitigation.	Minor	Slight adverse	Amenity of NMU route reduced due to temporary construction activity (from combination of noise, dust and visual impact).
NMU route along NCN 80/82/A493  Receptor location 2 on Figure 13.1, Volume 2	Construction activity may generate noise and dust and visual impact from moving construction vehicles could impact on the	Medium	Minor	Slight adverse	The use of Best Practicable Means mitigation.	Minor	Slight adverse	Amenity of NMU route reduced due to temporary construction activity (from combination of noise, dust and visual impact).

Receptor	Description of impact	Sensitivity	Magnitude	Significance	Mitigation	Magnitude (following mitigation)	Significance (following mitigation)	Comments
	amenity of NMU route							
NMU route along footpath along southern side of Afon Dyfi  Receptor location 3 on Figure 13.1, Volume 2	Construction activity may generate noise and dust and visual impact from moving construction vehicles could impact on the amenity of NMU route	Medium	Minor	Slight adverse	The use of Best Practicable Means mitigation.	Minor	Slight adverse	Amenity of NMU route reduced due to temporary construction activity (from combination of noise, dust and visual impact).
NMU route access along A487 south of Pont-ar-Ddyfi  Receptor location 4 on Figure 13.1, Volume 2	Construction activity may generate noise and dust and visual impact from moving construction vehicles could impact on the	Medium	Minor	Slight adverse	The use of Best Practicable Means mitigation.	Minor	Slight adverse	Amenity of NMU route reduced due to temporary construction activity (from combination of noise, dust and visual impact).

Receptor	Description of impact	Sensitivity	Magnitude	Significance	Mitigation	Magnitude (following mitigation)	Significance (following mitigation)	Comments
	amenity of NMU route							
A487 North of the Cambrian Railway Bridge where the A487 is moved to the west of the existing on to embankment  (Ref 5 on Figure 13.1, Volume 2)	Severance of cycle route.	Medium	Minor	Slight Adverse	The use of Best Practicable Means mitigation.  The A487 will be restricted to single-way working and the works all carried out in accordance with Chapter 8 of the Traffic Signs Manual (Department for Transport, 2009)	Minor	Slight adverse	There will be significant construction work within this area with services diversions, earthworks and roadworks operations. The A487 will be restricted to single-way working and the works all carried out in accordance with Chapter 8 of the Traffic Signs Manual (Department for Transport, 2009). These traffic management measures allow both pedestrians and cyclists to travel safely through the construction works. Amenity of route reduced because of diversion and construction activity (from combination of

Receptor	Description of impact	Sensitivity	Magnitude	Significance	Mitigation	Magnitude (following mitigation)	Significance (following mitigation)	Comments
								noise, dust and visual impact).
South of the Millennium Cycle Bridge where the proposed new viaduct crosses the NCN 8  (Ref 6 on Figure 13.1)	Severance of cycle route.	Medium	Minor	Slight Adverse	A diversion route would be provided and constructed to the same specification as the existing route, have a smooth and regular surface, will be clearly signed and securely fenced off to prevent access to the construction work.  Where the footway/cycleway crosses the new construction site/haul roads there will be a controlled crossing point to prevent any	Minor	Slight Adverse	Amenity of route reduced because of diversion and construction activity (from combination of noise, dust and visual impact). In addition, slight increase in journey length due to temporary diversion

Receptor	Description of impact	Sensitivity	Magnitude	Significance	Mitigation	Magnitude (following mitigation)	Significance (following mitigation)	Comments
					<p>conflict with construction traffic. This crossing will be manned and have gates to control crossing traffic.</p> <p>The use of Best Practicable Means mitigation</p>			
<p>North of the Millennium Cycle Bridge where the NCN8 runs adjacent to the proposed north abutment and tie in with the A487 at Y Ffridd</p> <p>(Ref 7 on Figure 13.1)</p>	<p>Severance of cycle route.</p>	<p>Medium</p>	<p>Moderate</p>	<p>Moderate Adverse</p>	<p>The use of Best Practicable Means mitigation.</p> <p>This area of the existing NMU route will be secured with Hera fencing or similar and maintained as far as practicable on the same alignment. Whenever construction work</p>	<p>Minor</p>	<p>Slight adverse</p>	<p>Amenity of route reduced because of diversion and construction activity (from combination of noise, dust and visual impact). In addition, slight increase in journey length due to temporary diversion</p>

Receptor	Description of impact	Sensitivity	Magnitude	Significance	Mitigation	Magnitude (following mitigation)	Significance (following mitigation)	Comments
					is likely to interfere with the footway/cycleway local diversions will be constructed or there will be manual control installed so as to maintain safe travel.			

### Vehicle Travellers - View from Road

- 13.9.2** As no construction mitigation is proposed in terms of views from the road the impacts are as described previously in Section 13.7.

### Vehicle Travellers - Driver's Stress

- 13.9.3** Construction impacts in relation to driver stress are the same as described previously in Section 13.7.

### Bus Travellers

- 13.9.4** Impacts to bus travellers during the construction stage would reduce from **moderate to slight adverse** with early consultation with bus operators, provision of advance travel information for passengers and effective traffic management.

### Community Severance

- 13.9.5** The further mitigation measures for public rights of way and cycle routes during the construction phase as set out in Table 13.14 would help to mitigate for temporary impacts on pedestrian journeys, although there would still be some hindrance to movement due to diversions this may dissuade some residents, particularly children and elderly people from making trips. Taking these factors into account, the predicted residual effect on community severance during construction is assessed to be **slight adverse**.

## 13.10 Residual Operational Effects on All Travellers

### Non-Motorised Users

- 13.10.1** Table 13.15 below outlines the operational effects of the Scheme on non-motorised user routes following mitigation.

Table 13.15: Operational impacts on NMU routes following mitigation

Receptor	Description of impact	Sensitivity	Magnitude	Significance	Mitigation	Magnitude (following mitigation)	Significance (following mitigation)	Comments
NMU route along National Cycle Network 8 / B4404  Receptor location 1 on Figure 13.1, Volume 2	No indirect/direct effect on this NMU route	Medium	No change	Neutral	N/A	No change	Neutral	This NMU route will be maintained throughout the operation stage. There will be no change to the amenity or length of the NMU route
NMU route along NCN 80/82/A493  Receptor location 2 on Figure 13.1, Volume 2	A single flow traffic calming measure would be provided along A493 at Pen-y-Bont cottages.	Medium	Moderate	Moderate Benefit	N/A	Moderate	Moderate Beneficial	This NMU route will be maintained throughout the operation stage. A single flow traffic calming measure would be provided along A493 and would enable a raised footway to be provided along the front of the Pen-y-Bont cottages, and a safer NMU crossing point on the Wales Coast Path and National Cycle Route

Receptor	Description of impact	Sensitivity	Magnitude	Significance	Mitigation	Magnitude (following mitigation)	Significance (following mitigation)	Comments
								No.82. The traffic calming measure would have a moderate beneficial effect on the safety of NMUs.
NMU route along footpath along southern side of Afon Dyfi, Volume 2  Receptor location 3 on Figure 13.1, Volume 2	Traffic noise from Scheme overhead	Medium	Minor	Slight adverse	N/A – Refer to chapter 12 Noise and Vibration which identified that no significant operational effects were indicated from the assessment therefore no additional mitigation is proposed.	Minor	Slight adverse	The Scheme alignment would be elevated over the existing NMU route along south bank of the Afon Dyfi. This might have a minor impact in terms of reducing route amenity because of the proximity of the new road. This impact would have a slight adverse effect on the NMU route during the operation stage.
NMU route access along A487 south of Pont-ar-Ddyfi	Part of the existing A487 would be closed to traffic and its	Medium	Moderate	Moderate Benefit	Part of the existing A487 would be closed to traffic and its	Moderate	Moderate Benefit	Part of the existing A487 would be closed to traffic and its trunk road status removed. This

Receptor	Description of impact	Sensitivity	Magnitude	Significance	Mitigation	Magnitude (following mitigation)	Significance (following mitigation)	Comments
Receptor location 4 on Figure 13.1, Volume 2	trunk road status removed.				trunk road status removed during the operation stage.			section would be along the Pont-ar-Ddyfi. The reduction or complete removal of vehicular traffic from this section would clearly be of Moderate Beneficial to pedestrians.
A487 North of the Cambrian Railway Bridge where the A487 is moved to the west of the existing on to embankment  Receptor location 5 on Figure 13.1, Volume 2	North of the Cambrian Railway line the new A487 is to be constructed on embankment extending into the fields to the west of the existing road.	Medium	Minor	Slight Adverse	N/A	Minor	Slight adverse	There will be a link road to connect with the existing Pont-ar-Ddyfi where the NCN8 is to be realigned and maintained. However slightly longer journey length of the Wales Coast Path at the southern end of the Scheme along the existing A487.
South of the Millennium Cycle Bridge where the proposed new	Traffic noise from Scheme overhead	Medium	Minor	Slight adverse	N/A – Refer to chapter 12 Noise and Vibration which identified that	Minor	Slight adverse	The Scheme alignment would be elevated over the existing NMU route. This might have a minor impact in terms

Receptor	Description of impact	Sensitivity	Magnitude	Significance	Mitigation	Magnitude (following mitigation)	Significance (following mitigation)	Comments
viaduct crosses the NCN 8  Receptor location 6 on Figure 13.1, Volume 2					no significant operational effects were indicated from the assessment therefore no additional mitigation is proposed.			of reducing route amenity because of the proximity of the new road. This impact would have a slight adverse effect on the NMU route during the operation stage.
North of the Millennium Cycle Bridge where the NCN8 runs adjacent to the proposed north abutment and tie in with the A487 at Y Ffridd  Receptor location 7 on Figure 13.1, Volume 2	Traffic noise from Scheme	Medium	Minor	Slight adverse	N/A – Refer to chapter 12 Noise and Vibration which identified that no significant operational effects were indicated from the assessment therefore no additional mitigation is proposed.	Minor	Slight adverse	NCN 8 route would be adjacent to the proposed north abutment and tie in with the A487 at Y Ffridd. This might have a minor impact in terms of reducing journey amenity from traffic noise. This impact would have a slight adverse effect on the NMU route during the operation stage.

Receptor	Description of impact	Sensitivity	Magnitude	Significance	Mitigation	Magnitude (following mitigation)	Significance (following mitigation)	Comments
Shared footway/cycleway across the new viaduct  Shown as the Scheme on Figure 13.1, Volume 2	The scheme would provide a shared footway/cycleway across the new viaduct for NMUs to use	Medium	Moderate	Moderate Benefit	N/A	Moderate	Moderate Benefit	This would have a moderate beneficial effect for pedestrians and cyclists by reducing severance caused by road traffic between residential areas and community facilities and places of employment. This reduction in severance may encourage increased travel by active modes within the area of Machynlleth.

## 13.11 Residual Operational Effects on Vehicle Travellers

### View from Road

**13.11.1** The Scheme will be dominant in the foreground and middle of the view from the existing A487 south of Pont-ar-Ddyfi. Whilst mitigation measures have been included relating to the design and aesthetics of the structure it is considered that landscape mitigation measures are ineffective from this viewpoint due to the position and angle of the view. Therefore the operational impact on views from the existing A487 south of Pont-ar-Ddyfi remain **moderate to large adverse**.

**13.11.2** The Scheme would result in a significant raising of the vertical profile allowing a much more open viewing opportunity for the vehicle traveller to the valley floor landscape and to the wider scenes beyond. The form of the new river crossing and any junction features would serve to provide additional visual interest for vehicle travellers, the operational impact on views from the Scheme would be **moderate beneficial**.

### Driver's Stress

**13.11.3** Overall, once the Scheme is in operation driver stress levels are predicted to be moderate beneficial due to reduced frustration as there would be no road closures for the Scheme during flood events, reduced congestion, enhanced surface quality, reduced fear of accidents as part of the overall aim of the Scheme. The Scheme would result in a **moderate beneficial** effect on driver stress.

### Bus Travellers

**13.11.4** Operation impacts in relation to bus travellers are the same as described previously in Section 13.7.

### Community Severance

**13.11.5** Effects on community severance during the operation stage is the same as previously described in Section 13.7.

## 13.12 Assessment of Cumulative Effects

**13.12.1** There are no major developments identified within the following categories that would cause cumulative effects:

- Development under construction;

- Application(s) permitted but which are not yet implemented;
- Submitted applications not yet determined, and which, if permitted, would affect the proposed development in the scoping request; and
- Development identified in the adopted and emerging development plan (with appropriate weight being given as they move closer to adoption) recognising that much information on any relevant proposals will be limited.

**13.12.2** Therefore no cumulative effects are considered as part of this assessment.

## **13.13 Inter-relationships**

**13.13.1** Potential receptors of these inter-relationship effects are users of the PRow and cycle paths (medium sensitivity) in terms of dust, noise and visual effects during both the construction and operational stages. This has already been considered within the overall assessment in terms of the amenity of the PRow/cycle route during both the construction and operation stages.

## **13.14 Summary of Effects**

**13.14.1** The Scheme would affect PRows and cyclepaths along the south bank of the Afon Dyfi and along the A487 at the northern and southern end of the Scheme. However the NMU surveys have shown that the PRows and cyclepaths are low usage particularly during the week.

**13.14.2** During the construction phase, there would be reduced amenity for PRows and cyclists along the south bank of the Afon Dyfi and along the A487 at the northern and southern end of the Scheme in terms of dust, noise disturbance and visual impacts however this would be temporary and construction mitigation measures would help to mitigate this. In addition, there would be severance of PRows and cycle routes however this would only be temporary and possible diversions would be in place.

**13.14.3** Once operational, the Scheme would remove traffic from Pont-ar-Ddyfi. The Wales Coast Path and NCN Route 82 runs through this section. A shared footway/cycleway would also be provided across the new viaduct. This would have a beneficial effect for pedestrians and cyclists by reducing severance caused by road traffic between residential areas and community facilities and places of employment. This reduction in severance may encourage increased travel by active modes within the area of Machynlleth.

- 13.14.4** This improvement along the Wales Coast Path and NCN Route 82 support many of the national, regional and local policies and plans that relate to walking and cycling and travel by active modes. This included policies to promote walking and cycling within the National Transport Plan, National Transport Plan SEA Objectives and the Walking and Cycling Action Plan for Wales. It also supports the regard that Welsh Government highway schemes must have for enhancing the provision for walking and cycling as set out in the Active Travel (Wales) Act 2013.
- 13.14.5** With regard to vehicle travellers, in summary the landscape mitigation and Scheme earthworks would result in enhancing the local landscape. Woodland and hedge planting would primarily be native deciduous species and therefore in places seasonal changes would allow filtered views to the landscape beyond. At night the lit urban area of Machynlleth would also be apparent from certain sections. Following the construction works, all embankments would be seeded with a lowland wildflower meadow mix to reinstate the ground cover whilst benefiting wildlife and reducing the maintenance burden.
- 13.14.6** The Scheme would result in a significant raising of the vertical profile allowing a much more open viewing opportunity to the valley floor landscape and to the wider scenes beyond. Although the Scheme will be dominant in the foreground and middle of the view from the existing A487 south of Pont-ar-Ddyfi.
- 13.14.7** The Scheme once operational would result in a reduction in drivers' stress levels due to reduced congestion, enhanced surface quality, reduced frustration and fear of accidents.
- 13.14.8** When the Scheme is operational, part of the existing A487 along the Pont-ar-Ddyfi would be closed to traffic and a Traffic Regulation Order would restrict use to permitted land owners only.