

Welsh Government

M4 Corridor around Newport

Environmental Statement Volume 1

Chapter 14: All Travellers

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14 All Travellers

14.1 Introduction

14.1.1 This chapter of the Environmental Statement (ES) describes the assessment of effects for all travellers resulting from the proposed new section of motorway between Junction 23A at Magor and Junction 29 at Castleton, together with the proposed Complementary Measures. The Complementary Measures include the reclassification of the existing M4 (between the same two junctions) and the provision of improved facilities for pedestrians, cyclists and equestrians.

14.2 Legislation and Policy Context

Relevant Legislation

14.2.1 Chapter 6 of this ES provides an overarching and strategic legislative context for the Scheme from an environmental perspective. In addition, relevant legislation to the All Travellers assessment includes the Active Travel (Wales) Act, 2013. This legislation 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 proposed Active Travel Action Plan (Welsh Government, 2014a). In addition, the Transport Act 2000 (as amended by the Transport (Wales) Act 2006) is relevant.

Planning Policy Context

14.2.2 Chapter 6 of this ES provides an overarching policy context for the Scheme from an environmental perspective. In addition, the assessment has had regard to the following local policy documents. It should be noted that whilst these documents provide context, they are not determinative.

National Policy

14.2.3 The following national (Welsh) policy is relevant to the All Travellers assessment.

- Planning Policy Wales (Welsh Government, 2016). Planning Policy Wales sets out the objectives for 'Transport' (including walking and cycling) in Chapter 8 and 'Tourism, Sport and Recreation' in Chapter 11.
- Technical Advice Note (TAN) 16 (Welsh Assembly Government, 2009): Sport, Recreation and Open Space.
- Technical Advice Note (TAN) 18 (Welsh Assembly Government, 2007): Transport.
- One Wales: Connecting the Nation (Welsh Assembly Government, 2008) 'The Wales Transport Strategy' and the 'National Transport Plan 2010'.

Local Policy

14.2.4 The following local planning policies are relevant to the All Travellers assessment.

Monmouthshire County Council

14.2.5 The Monmouthshire Local Development Plan (Monmouthshire County Council, 2014) was adopted on 27 February 2014 and covers the period from 2011-2021. The following policies are relevant to All Travellers.

- Policy MV2: Sustainable Transport Access, which requires development projects to include provision for appropriate sustainable transport links, including public transport, walking and cycling and links into the existing or proposed public rights of way, walking, cycleway and green infrastructure networks.
- Policy MV3: Public Rights of Way, which requires satisfactory provision to be made where a development project obstructs or adversely affects a public right of way.
- Policy MV4: Cycleways, which supports the provision of new cycleways where they improve opportunities for sustainable travel or recreational cycling, together with the needs of walkers, horse riders and those with limited mobility where appropriate.

14.2.6 The Transport Act 2000, as amended by the Transport (Wales) Act 2006, requires Monmouthshire County Council to produce a Local Transport Plan (LTP) every five years and to keep it under review. The 2015 Monmouthshire LTP (Monmouthshire County Council, 2015) sets out the long term strategy for the county and includes a programme for projects over a five year period. This programme includes the development and implementation of an active travel plan for Magor and Undy.

Newport City Council

14.2.7 The Newport Local Development Plan (Newport City Council, 2015a) was adopted on 27 January 2015 and sets out the development framework for Newport until 2026. The following policies are relevant to the All Travellers assessment.

- Policy T5: Walking and Cycling, which states that a network of safe walking and cycling routes will continue to be developed and protected, including National Cycle Route 4 which runs through Newport.
- Policy T6: Public Rights of Way Improvement, which states that proposals to improve or extend the public rights of way network will be encouraged with an emphasis on sustainability and access for all.
- Policy T7: Public Rights of Way and New Development, which requires development projects to retain public footpaths, bridleways or cycleways or make provision for suitable alternatives.
- Policy T8: All Wales Coast Path, which states that development proposals should protect and enhance this route with provision of additional routes encouraged.

- Policy CF4 ‘Riverfront Access’, which states that access to the riverfront in the form of managed footpaths and cycle routes will be encouraged, where practicable.
- Policy CF5 ‘Usk and Sirhowy Valley Walks’, which states that development that would affect or significantly reduce the recreational value of these routes would not be permitted.

14.2.8 The Transport Act 2000, as amended by the Transport (Wales) Act 2006, requires Newport City Council to produce an LTP every five years and to keep it under review. The 2015 Newport LTP (Newport City Council, 2015f) supports the ‘*National Transport Plan priorities in delivering the Cardiff Capital Region complementary measures to achieve the full value of transport investment to support:*

- *Economic growth: Support economic growth and safeguard jobs across Wales, but with a particular focus on the Cardiff Capital Region*
- *Access to employment: Reduce economic inactivity by delivering safe and affordable access to employment sites*
- *Tackling poverty: Maximise the contribution that effective and affordable transport services can make to tackling poverty and target investment to support improvements in accessibility for the most disadvantaged communities in the region*
- *Sustainable travel and safety: Encourage safer, healthier and sustainable travel*
- *Access to services: Connect communities and enable access to key services.’*

14.3 Assessment Methodology

Scope of the Assessment

14.3.1 The All Travellers topic includes an assessment of the effects on the following resources.

- Public rights of way (footpaths, bridleways and restricted byways).
- Cycle routes.
- Permissive non-motorised user (NMU) routes.
- Public highways.
- Public transport.
- Overbridge and underpass crossings.

14.3.2 The assessment of effects on all travellers considers the following.

- Permanent land take required for the Scheme.
- Construction of the proposed new section of motorway to the south of Newport.
- Operation of the proposed new section of motorway.
- Complementary Measures, both during construction and operation.

14.3.3 In addition, changes in amenity and effects on community severance and driver stress are described.

14.3.4 The assessment of effects on 'Views from the Road' is set out in Chapter 9 of this ES.

Relevant Guidance

14.3.5 The following guidance documents are relevant to this assessment:

- Design Manual for Roads and Bridges (DMRB) Volume 11, Section 2, Part 5, HA 205/08 (Highways Agency *et al.*, 2008);
- DMRB Volume 11, Section 3, Part 8 'Pedestrians, Cyclists, Equestrians and Community Effects' (Highways Agency, 1993a) in respect of the potential effects on pedestrians, cyclists and equestrians;
- DMRB Volume 11, Section 3, Part 9 'Vehicle Travellers' (Highways Agency, 1993b) in respect of the potential effects on driver stress; and
- DMRB Interim Advice Note 125/09(W) Supplementary guidance for users of DMRB Volume 11 'Environmental Assessment' (Wales Only) (Welsh Assembly Government, 2009).

14.3.6 With respect to non-motorised users (pedestrians, cyclists and equestrians), the requirements of the DMRB Volume 11, Section 3, Part 8 (Highways Agency, 1993a) are as follows.

- Provide a qualitative assessment of the existing provision of, and proposals for, pedestrian, cyclists and equestrian facilities, which may be affected by the Scheme, including the existing usage of these facilities.
- Provide a qualitative assessment of the potential changes in the type and level of provision of pedestrian, cyclists and equestrian facilities as a result of the Scheme.
- Provide a qualitative assessment of the effects on non-vehicular movements resulting from the Scheme, including any changes to journey lengths, amenity or safety, and any likely changes to community severance.

14.3.7 For the purposes of this assessment, amenity is defined as the relative pleasantness of the environment or journey. Various criteria are employed to assess the effect on amenity including levels of visual intrusion and noise, which are assessed in detail in Chapters 9 and 13 respectively of this ES. In accordance with DMRB methodology in relation to changes in amenity, a commentary of the relevant sections of those assessments is set out in relation to changes in amenity for All Travellers during construction and operation of the Scheme.

14.3.8 Community severance is defined as *'the separation of residents from the facilities and services they use within their community'* (DMRB Volume 11, Section 3, Part 8 (Highways Agency, 1993a, paragraph 5.2)).

Study Area

14.3.9 DMRB Volume 11, Section 3, Parts 8 and 9 (Highways Agency 1993a, 1993b) do not specify a study area for the assessment of effects on pedestrians, cyclists, equestrians and vehicle travellers, although Part 8 references the need

to identify existing and proposed public rights of way that may be affected by the route corridor, particularly those used for visiting important community facilities (paragraph 9.4(i)). The All Travellers study area for the Scheme therefore includes those routes connecting the settlements between Junctions 23A and 29 (Castleton, Newport, Magor and smaller settlements to the south), with account taken of the nearest available route where these are not available within these settlements.

Approach to Identification of Baseline Conditions

14.3.10 A desk based study to identify baseline conditions has been undertaken to establish the existing provision of pedestrian, cyclist and equestrian facilities, vehicle routes and the existing travel patterns and use of these resources. This has utilised the following data sources.

- M4 Corridor around Newport – Design Manual for Roads and Bridges Stage 2 Environmental Assessment (Welsh Government, 2014c).
- Non-Motorised User Context Report (Extract provided at Appendix 14.2).
- Ordnance Survey (OS) mapping.
- OS MasterMap Address Layer data.
- Definitive map of public rights of way (PRoW).
- OS Points of Interest data.
- Newport City Council at www.newport.gov.uk.
- Monmouthshire County Council at www.monmouthshire.gov.uk.
- Sustrans web based data at www.sustrans.org.uk.
- Data from public transport operators.
- Recreational data available from local authority and web resources.
- A Cardiff Capital Region Metro: Impact Study (Welsh Government, 2013) and Update Report (Welsh Government, 2014d).

14.3.11 The pedestrian, cyclist and equestrian baseline conditions have also been established by undertaking site visits and public rights of way condition and user surveys. The user surveys provided data on Non-Motorised User (NMU) flows and the nature of NMUs, which is set out in the Public Rights of Way User Survey Report at Appendix 14.1. These surveys complement the counts that were undertaken for the NMU Context Report for the Scheme (Appendix 14.2).

14.3.12 A number of site surveys were undertaken in 2015 and 2016 to ascertain the nature and condition of the routes crossing or proximate to the Scheme and to check for obstructions and indications of evidence and level of use. Discrepancies regarding the alignment of routes or incidences where there is no evidence of the route on the ground were also noted and subsequently discussed with Newport City Council and Monmouthshire County Council.

14.3.13 The public rights of way user survey was undertaken during 2015 to ascertain the level of pedestrian, equestrian and cycle use of the public rights of way and other linear resources within the study area. This survey was undertaken on three separate occasions that included weekdays and weekends both within

and outside school holidays, so that a fair estimation of public use could be made.

14.3.14 The following survey locations were selected taking account of popular walking, equestrian and cycling routes.

- Location 1: Berryhill Farm (National grid reference (NGR) 326943, 184012).
- Location 2: Percoed Lane/Green Lane junction (NGR 328481, 183527).
- Location 3: Pye Corner, at junction of Wales Coast Path and National Cycle Route 4 (NGR 334233, 185072).
- Location 4: Magor, at the junction of public footpath 372/13/1 running north from Dancing Hill to the M4 underpass to the east of St Bride's Road with public footpaths 372/87/1 and 372/9/1 (NGR 342514, 187683).

Consultation

14.3.15 A summary of consultation with stakeholders or consultees is provided in the table below.

Table 14.1: Consultation Responses Relevant to this Chapter

Date	Consultee and Issue Raised	How/Where Addressed
2014	Responses to Welsh Government Draft Plan as follows.	
	Public response: - Effects on footpaths and cycleways on the Gwent levels, noting increasing popularity of cycling and walking. Support for providing new or improving existing infrastructure that promotes cycling or walking. - Concern regarding Scheme acting as a barrier severing communities from each other or from services and amenities.	Effects on public rights of way provided in the Land Take Effects, Construction Effects and Operational Effects sections of this chapter. New infrastructure is covered under Operational Effects as are issues associated with severance.
	Monmouthshire County Council response: Design should retain and enhance convenience and amenity for users.	Maintenance of the public rights of way network arising from the Land Take, Construction and Operation of the Scheme are covered in those sections of this chapter. Issues associated with amenity are covered under Construction and Operational Effects sections of this chapter.
	SWWITCH response: Supportive of opportunity to provide strategic walking and cycling infrastructure as part of Scheme (in support of Active Travel Bill).	Maintenance of the existing public rights of way network and provision of new infrastructure is covered under the Operational Effects section of this chapter.
	Newport Friends of the Earth response: Reducing congestion can only be attained by a modal shift away from cars to public transport, cycling and walking.	Issues associated with a reduction in congestion and modal shifts are covered in the Traffic Forecasting Report for the Scheme. Existing and proposed NMU resources are described in the Land Take and Operational Effects sections of this chapter.

Date	Consultee and Issue Raised	How/Where Addressed
2015	<p>Responses to Scoping Report</p> <p>Newport City Council deal with the following matters:</p> <ul style="list-style-type: none"> - Impacts on highways and PRoW at the Castleton Junction and Pound Hill. - Proposed bridge at Percoed Lane to maintain the connectivity of the Cardiff Newport Cycleway. - Stopping up of Green Lane or Pont Ystyll. - Compliance with duties under the Active Travel Act 2013. - Impact on the Wales Coast Path. - Impact on generation of tourism and access and recreation during the construction phase. - Use of grass verges as community links. - Impacts of construction corridors and compounds etc. - Impact on Bareland Street, Rush Wall and NCN routes. 	<p>These matters are dealt with in the Land Take, Construction and Operational Effects section of this chapter.</p> <p>Wider economic aspects are covered in the Wider Economic Impact Report for the Scheme.</p>
	<p>Natural Resources Wales (NRW) stated in relation to the All Travellers topic that <i>"We refer you to Newport City Council and Monmouthshire County Council for their advice and requirements in this area"</i>.</p> <p>NRW has previously provided a detailed response with respect to potential impacts on the Wales Coast Path, and this has been followed up by further consultation on the temporary effects on the route to the west of the River Ebbw and the east of the River Usk and the associated mitigation measures that have been incorporated into the Scheme design.</p>	<p>Matters relating to the Wales Coast Path are dealt with in the Land Take, Construction and Operational Effects section of this chapter.</p>
2015	<p>Newport City Council Meetings were held with the Council to explain the proposals for the new section of motorway relating to All Travellers and to discuss measures to be incorporated into the Scheme to maintain the connectivity of the highway network (including public rights of way, other NMU routes and sections of the Wales Coast Path and Newport Coast Path) during construction and operation. The provision of new NMU routes was also developed in consultation with the Council.</p>	<p>These matters are dealt with in the Land Take, Construction and Operational Effects section of this chapter.</p>
2015	<p>Monmouthshire County Council Meetings were held also held with Monmouthshire CC to consider the Scheme proposals and to discuss measures to be incorporated into the</p>	<p>These matters are dealt with in the Land Take, Construction and Operational Effects section of this chapter.</p>

Date	Consultee and Issue Raised	How/Where Addressed
	Scheme to ensure that connectivity of the highway network (including public rights of way and other NMU routes) was maintained during construction and operation. The provision of new NMU routes was also developed in consultation with the Council.	
2015	Sustrans Meetings were held with Sustrans to consider the potential impacts on cycle routes arising from the construction and operation of the new section of motorway and to discuss measures to be incorporated into the Scheme to ensure that cycle routes remained open during construction and operation. The provision of new routes available to cyclists was also developed in consultation with Sustrans.	These matters are dealt with under 'Cycle Routes' in the Land Take, Construction and Operational Effects section of this chapter.

Assessment Criteria and Assignment of Significance

- 14.3.16** A qualitative assessment of impacts on All Travellers based on professional judgement has been undertaken to indicate the significance of effects on identified receptors, based on the value or sensitivity of the receptor and the magnitude of the predicted impact.
- 14.3.17** The significance of a potential effect is a function of the value or sensitivity of the resource or receptor and the magnitude of the impact (including the timescale involved - permanent or temporary). The criteria for assessing the significance of environmental effects on all travellers take account of the guidance that is provided on this topic in the DMRB Volume 11, Section 2, Part 5 (HA 205/08) (Highways Agency *et al.*, 2008) as set out in Chapter 5 of this ES.

Receptor Sensitivity

- 14.3.18** The receptors relevant to the All Travellers assessment comprise the pedestrian, cyclist and equestrian facilities that may be affected by the Scheme, the users of those facilities and vehicle travellers along the existing M4, the proposed new section of motorway and other roads within the area.
- 14.3.19** The value or sensitivity of these receptors relates to the importance of the resource, facility or receptor together with its sensitivity to change, and the All Travellers assessment uses the categories of sensitivity/value (i.e. high, medium, low or negligible) in Table 14.2 below and as set out in Chapter 5 'Approach to Environmental Assessment'.

Table 14.2: Definitions of Sensitivity or Value for All Travellers

Value (sensitivity)	Typical Descriptors
Very high	Very high importance and rarity, international scale and very limited potential for substitution.
High	High importance and rarity, national scale, and limited potential for substitution.
Medium	High or medium importance and rarity, regional scale, limited potential for substitution.
Low (or Lower)	Low or medium importance and rarity, local scale.
Negligible	Very low importance and rarity, local scale.

14.3.20 The sensitivity/value of each resource, facility or receptor is set out in the assessment section of this chapter. For example, individual public rights of way would generally be of 'low' sensitivity/value as they would have a low or medium importance or rarity at a local scale. However, where such routes are promoted regionally or nationally, such as the Newport Coast Path/Wales Coast Path or a National Cycle Route, they would have an increased level of sensitivity/value.

Magnitude of Impact

14.3.21 The magnitude (or scale) of change (adverse or beneficial) on All Travellers resources or receptors is described using the levels of impact in Table 14.3 below and as set out in Chapter 5 'Approach to Environmental Assessment'.

Table 14.3: Definitions of Impact Magnitude for All Travellers

Magnitude of Impact	Typical Criteria Descriptors
Major	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements (Adverse).
	Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality (Beneficial).
Moderate	Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements (Adverse).
	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality (Beneficial).
Minor	Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements (Adverse).
	Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring (Beneficial).
Negligible	Very minor loss or detrimental alteration to one or more characteristics, features or elements (Adverse).
	Very minor benefit to or positive addition of one or more characteristics, features or elements (Beneficial).
No change	No loss or alteration of characteristics, features or elements; no observable impact in either direction.

Significance of Effect

14.3.22 The sensitivity of the receptor and the magnitude of impact have been identified separately and contribute to the evaluation of the likely significance of the effect. The evaluation of significance is based on the All Travellers objectives for the Scheme, outcomes of consultation to date and professional judgement, and has

been assessed in accordance with the approach recommended by the DMRB Volume 11, Section 2, Part 5 (HA 205/08) (Highways Agency *et al.*, 2008) and supplementary advice in Interim Advice Note 125/09(W) (Welsh Assembly Government, 2010) as presented in Chapter 5. This uses the following terminology: Very Large, Large, Moderate, Slight and Neutral, as set out in the significance matrix in Table 14.4.

Table 14.4: Significance of Effect for All Travellers

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

14.3.23 These levels of significance apply to both adverse and beneficial effects during the construction period and arising from the operation of the Scheme. For the All Travellers topic these take account of the guidance set out in Table 2.3 of the DMRB Volume 11, Section 2, Part 5 (HA 205/08) (Highways Agency *et al.*, 2008) as set out in Chapter 5 and Table 14.5 below.

Table 14.5: Significance of Effect Categories for All Travellers

Significance category	Typical Descriptors of Effect
Very large	Only adverse effects are normally assigned this level of significance. They represent key factors in the decision-making process. These effects are generally, but not exclusively, associated with sites or features of international, national or regional importance that are likely to suffer a most damaging impact and loss of resource integrity. However, a major change in a site or feature of local importance may also enter this category.
Large	These beneficial or adverse effects are considered to be very important considerations and are likely to be material in the decision-making process.
Moderate	These beneficial or adverse effects may be important, but are not likely to be key decision-making factors. The cumulative effects of such factors may influence decision-making if they lead to an increase in the overall adverse effect on a particular resource or receptor.
Slight	These beneficial or adverse effects may be raised as local factors. They are unlikely to be critical in the decision-making process, but are important in enhancing the subsequent design of the project.
Neutral	No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

14.3.24 For the purposes of this assessment those effects identified as being of 'Moderate' significance or greater are regarded as being significant in EIA terms. Effects of 'Slight' or lesser significance have been identified but are not considered significant in EIA terms.

Changes in Amenity

14.3.25 Amenity is defined in DMRB Volume 11, Section 3, Part 8 (Highways Agency, 1993a) 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. In accordance with the methodology set out in the DMRB, a description of the overall change in amenity for NMU journeys is provided taking account of the assessments set out in Chapter 9 'Landscape' and Chapter 13 'Noise'.

Community Severance Assessment

14.3.26 Community severance is defined in DMRB Volume 11, Section 3, Part 8 (Highways Agency, 1993a) 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.

14.3.27 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.
- The provision of mitigation.

14.3.28 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'*.

14.3.29 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.
- 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.

View from the Road Assessment

14.3.30 The assessment of 'View from the Road' which the DMRB defines as *'the extent to which travellers, including drivers, are exposed to different types of scenery through which a route passes'* is set out in Chapter 9 of this ES.

Driver Stress Assessment

14.3.31 The methodology adopted for the assessment of driver stress follows the guidance provided in the DMRB Volume 11, Section 3, Part 9 (Highways Agency, 1993b).

14.3.32 Driver stress is defined for the purposes of environmental assessment as *'the adverse mental and physiological effects experienced by a driver traversing a road network'* (Highways Agency, 1993b, paragraph 3.1). A variety of factors including traffic speed and flow, road layout, signage, and evenness of road surfacing can influence stress levels and induce *'feelings of discomfort, annoyance, frustration or fear culminating in physical and emotional tension that detracts from the value and safety of a journey'* (Highways Agency, 1993b, paragraph 3.1).

14.3.33 The DMRB states that driver stress has three main components.

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

14.3.34 The definitions of these terms and some of the criteria contributing to them, as stated in the DMRB (Highways Agency, 1993b), are as follows:

'Frustration is caused by a driver's inability to drive at a speed consistent with his or her own wishes in relation to the general standard of the road. It increases as speed falls in relation to expectations and may be due to high flow levels, intersections, roadworks or difficulties in overtaking slower traffic. Congestion can lead to frustration by creating a situation in which the driver does not feel in control.....'

14.3.35 Fear of potential accidents results from the *'presence of other vehicles, inadequate sight distances and the likelihood of pedestrians stepping out into the road'*. Additional factors such as *'inadequate lighting, roadworks, narrow roads and poorly maintained surfaces'* are also contributing factors. According to the DMRB fear is highest where traffic speeds, flows and the percentage of HGVs are all high and these factors are of more importance during adverse weather conditions. A new scheme may increase driver stress because of increased traffic speeds and flows, although the superior driving standards of a new scheme often offset this.

14.3.36 Uncertainty is defined by DMRB as being primarily caused by signing *'that is inadequate for the individual's purposes'*.

14.3.37 The DMRB maintains that *'available research evidence does not permit the use of finely graded assessments of driver stress'*. Consequently, as an indicator of

driver stress, the DMRB tabulates the relationship between average peak hourly vehicle flow per lane and average journey speed in kilometres per hour to describe levels of driver stress on a three point descriptive scale: Low, Moderate or High.

- 14.3.38** The DMRB (Highways Agency, 1993b) provides separate guidance depending on the design standard of the road being assessed. Guidance relevant to single carriageway roads, dual carriageway roads and motorways is set out in Tables 14.6, 14.7 and 14.8 below.

Table 14.6: Single Carriageway Roads

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

Source: DMRB Volume 11, Section 3, Part 9, Chapter 4, Table 3

* A car or light van equals one flow unit. A commercial vehicle over 1½ tons unladen weight or a public service vehicle equals 3 flow units.

** Moderate in urban areas

Table 14.7: Dual Carriageway Roads

Average peak hourly flow per lane in flow Units*/ 1 hour	Average Journey Speed Km/hr		
	Under 60	60 to 80	Over 80
Under 1200	High**	Moderate	Low
1200 to 1600	High	Moderate	Moderate
Over 1600	High	High	High

Source: DMRB Volume 11, Section 3, Part 9, Chapter 4, Table 2.

* A car or light van equals one flow unit. A commercial vehicle over 1½ tons unladen weight or a public service vehicle equals 3 flow units.

** Moderate in urban areas

Table 14.8: Motorways

Average peak hourly flow per lane in flow Units*/ 1 hour	Average Journey Speed Km/hr		
	Under 75	75 to 95	Over 95
Under 1200	High	Moderate	Low
1200 to 1600	High	Moderate	Moderate
Over 1600	High	High	High

Source: DMRB Volume 11, Section 3, Part 9, Chapter 4, Table 1.

* A car or light van equals one flow unit. A commercial vehicle over 1½ tons unladen weight or a public service vehicle equals 3 flow units.

- 14.3.39** The DMRB requires an assessment to be made for the existing situation and also for the worst case in the fifteen years after opening. Traffic data for the year 2015 has been used to assess the degree of driver stress in the existing situation between Junctions 23A and 29 of the existing M4. Predicted traffic flows and design speeds for 2037 have been used to assess the situation in the fifteenth year after the opening of the Scheme.

Limitations of the Assessment

- 14.3.40** 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.

14.4 Baseline Environment

14.4.1 The proposed new section of motorway is located within the administrative areas of Newport City Council and Monmouthshire County Council. The eastern part of the route around Junction 23A and the settlements of Magor and Undy lie in Monmouthshire. Outside the existing settlements, farmland and woodland lie to the north of the existing M4, with the sparsely populated eastern part of the Gwent Levels to the south of Magor.

14.4.2 The developed urban area of Newport predominantly lies to the north of the proposed new section of motorway, including the Tata Steel Works and the Glan Llyn development. The land to the south comprises the sparsely populated Gwent Levels with pockets of industrial development around the River Usk.

Public Rights of Way

14.4.3 In addition to the road network linking Newport, Magor and Castleton with the settlements to the north of the existing M4 and the outlying small settlements of the Gwent Levels to the south, pedestrians, cyclists and equestrians have access to a network of public rights of way. These predominantly comprise public footpaths, with fewer public bridleways and restricted byways as shown on Figure 14.1.

14.4.4 These public rights of way are predominantly used for informal recreation, providing NMU access within and between settlements and to the adjacent countryside. Some already cross the existing highway network, including the existing M4 at the eastern (Magor) and western (Castleton) ends of the proposed new section of motorway. Some of these allow for a variety of circular walks of varying distances, a number of which are promoted by the local planning authority.

Public Footpaths

14.4.5 The following public footpaths either cross the proposed new section of motorway or link with it, as shown on Figure 14.1.

Within Newport:

- 390/11; 390/12; 390/15; 390/17; 390/18; 390/21; 390/22 and 399/29.
- 400/2; 400/10; 400/11.
- 401/4 (Wales Coast Path/Newport Coast Path east of the River Usk).
- 412/11 (Wales Coast Path/Newport Coast Path west of the River Ebbw).

Within Monmouthshire:

- 372/9/1; 372/9/2; 372/12/1; 372/12/2; 372/12/3; 372/12/4; 372/13/1; 372/29/1; 372/69/2; 372/69/3; 372/69/5; 372/69/8; 372/69/10; 372/69/11; 372/69/13; 372/85/1; 372/86/1; 372/87/4; 372/92/1.
- 378/3/1 and 378/22/1 cross the proposed construction haul road to and from Ifton Quarry.

Public Bridleways

14.4.6 No public bridleways cross the proposed new section of motorway.

Restricted Byways

14.4.7 Restricted byway 372/30/1 and 372/30/2 runs along a track between public footpath 372/29/1 and The Elms road to the immediate north of the existing M4. Restricted byway 378/17/2, running through Thicket Wood to the north of the M48 at Llanfihangel, links to the unclassified county road along which the proposed construction haul route to/from Ifton Quarry runs.

Long Distance Paths

14.4.8 The proposed new section of motorway crosses the Wales Coast Path to the west of the River Ebbw and the east of the River Usk. Around Newport, this route is also known as the Newport Coast Path, which totals 32 km between Redwick in the east and Peterstone Church in the west. The section alongside both river corridors runs northwards from the West Usk Lighthouse, over the City Bridge or the Newport Transporter Bridge and then south past the docks to Great Traston Meadows Reserve. Between Lighthouse Road and the Transporter Bridge, the Coast Path is an on-road route. South of here, it follows the eastern bank of the River Usk before running through and adjacent to industrial areas to the east and west of the railway. Past the Solutia industrial site it winds through grassland on a track to Pye Corner and the Newport Wetlands National Nature Reserve.

14.4.9 Visitor numbers on the Wales Coast Path within Newport and Monmouthshire are continuously recorded by a series of counters positioned at regular intervals along the route. These provide a monthly breakdown of usage, for which the latest data covers the period January to December 2014.

14.4.10 Visitor numbers along the Newport Coast Path in the area where it is crossed by the new section of motorway are shown for the following locations (see Figure 14.1) in Table 14.9 below.

- **NO5 Transporter:** The Transporter Bridge, which crosses the River Usk between the A48 and Stephenson Street to the north of the new section of motorway.
- **NO6 Burnt House:** Located along the coast path towards the Newport Wetlands National Nature Reserve, to the south of the Solutia Nature Reserve and to the north of Nash village and south of the new section of motorway.
- **N13 Solutia:** On the coast path past the Solutia works immediately adjacent to the new section of motorway at the Usk Bridge.

Table 14.9: Newport Coast Path Visitor Numbers

	Transporter	Burnt House	Solutia
Date	NO5	NO6	N13
January 2014	394	90	1052
February 2014	383	87	920
March 2014	588	160	1520
April 2014	512	263	1914
May 2014	575	309	2466
June 2014	587	517	1686
July 2014	575	442	1492
August 2014	1057	421	1174
September 2014	697	344	1221
October 2014	609	181	715
November 2014	357	118	614
December 2014	547	129	576
2014 Total	6,881	3,061	15,350
2013 Total	5,538	2,731	20,929
% Change (2013 to 2014)	24%	12%	-27%

Source: Natural Resources Wales

- 14.4.11** The data set out in Table 14.9 highlight that there were markedly higher visitor flows at the Solutia count location, with the highest monthly figure of around 2,500 even though this is 27% down on the 2013 figures. This may, in part, be a result of National Cycle Network Route 4 (NR4) running along this section of the Wales Coast Path. By contrast, fewer people accessed the coast path at the Transporter Bridge and Burnt House locations, although both locations have seen double figure increases on the previous year. At the Transporter Bridge this may be due in part to the industrial nature of the Newport Docks environment south of the bridge and is also likely to reflect the fact that the bridge is only open from Wednesday to Sunday (plus Bank Holidays) between the beginning of April and the end of September. For Burnt House the figures illustrate that a high number of visitors following the coast path past Solutia do not go on towards the Newport Wetlands National Nature Reserve on that route.
- 14.4.12** The Usk Valley Walk is a 77 km route that runs eastwards and then north along the Usk Valley between Caerleon and Brecon. It does not currently cross the route of the proposed new section of motorway but there are plans to extend the route through Newport, over the A48 to join the Newport Coast Path at the City Bridge and then run southwards to the Wetlands Centre.
- 14.4.13** The Sirhowy Valley Walk is a 42 km route between Sirhowy (near Tredegar) and Tredegar House in Newport. It crosses the existing M4 to the north/east of Junction 27 and runs south through the western part of Newport to Duffryn and Tredegar House Country Park. It does not currently cross the route of the proposed new section of motorway but there are plans to extend the route from Tredegar House to link to the Newport Coast Path at Lighthouse Road and onwards to Peterstone Church.
- 14.4.14** Newport City Council has published a series of four brochures on walks in the Newport area. Their publication 'Lets Walk Newport - Countryside Walks' (Newport City Council, 2015b) includes ten walks. Only one of these, Walk 2 'Castleton Circular Walk', is located within the study area. This crosses the

route of the new section of motorway to the south of Berryhill Farm along public footpaths 390/17 and 390/18.

14.4.15 The publication 'Lets Walk Newport - Healthy Challenge Walks' (Newport City Council, 2015c) also includes ten walks. Of these, none cross the route of the new section of motorway, but Walk 2 'Solutia Circular Trail' follows a section of the national cycle network (National Cycle Route 4) and the Wales Coast Path to the south of the proposed new section of motorway corridor at Pye Corner.

14.4.16 Additional walks are described in two brochures 'Lets Walk Newport - Healthy Start Walks' (Newport City Council, 2015d) or 'Lets Walk Newport - Small Walks for Small Feet' (Newport City Council, 2015e). None of these routes cross the proposed new section of motorway.

Cycle Routes

14.4.17 National Cycle Network Route 4 (NR4) is part of the national cycle network (see Figure 14.1). It is a long distance route between London and Fishguard via Reading, Bath, Bristol, Newport, Swansea, Carmarthen, Tenby, Haverfordwest and St. Davids. In Wales, NR4 forms the main option of the Celtic Trail East cycle route passing through Newport, parts of which are traffic-free.

14.4.18 NR4 crosses the existing M4 near Junction 28 and runs in a generally eastern direction along Pencarn Way, Duffryn Way and Docks Way, crossing the River Usk over the City Bridge. On the eastern side of the river, NR4 runs along Corporation Road and crosses the route of the proposed new section of motorway between Traston Road and Pye Corner. From Pye Corner NR4 runs east along Broad Street Common and North Row to the south of the proposed new section of motorway before turning south to Redwick and then north eastwards to Undy and Caldicot.

14.4.19 NR4 links to the following on-road and traffic-free local routes within the All Travellers study area, none of which are crossed by the route of the new section of motorway. None of these form part of the national cycle network.

- On-road local routes along West Nash Road towards the Wetlands Centre; Stephenson Street to the Newport Transporter Bridge; and Traston Road which is traffic-free at its eastern end.
- Traffic-free local routes along the Southern Distributor Road (SDR); Meadows Road and the A4810.

14.4.20 Sustrans have advised that cyclists are discouraged from using some of the on-road links to NR4 (e.g. Lighthouse Road and Nash Road) due to the volume and speed of vehicular traffic. To address this, there is a Living Landscapes bid to construct an off-road route from Pye Corner to the Wetlands Centre, which would join NR4 to the south of the proposed new section of motorway and would be unaffected by it.

14.4.21 The local route along the A4810 runs around the roundabout at the northern end of the proposed Docks Link Road.

14.4.22 Traston Road, a section of which is stopped up to motor vehicles at its eastern end, is signed as a regional cycle route which was part of the South East Wales Transport Board and Welsh Assembly Government's regional cycling strategy.

14.4.23 The Cardiff to Newport Cycleway is a new route for cyclists and pedestrians through the countryside past Marshfield between the two cities avoiding the A48. The route, which utilises some existing local roads, unclassified 'green lanes' and new off-road sections, is a joint project by Newport City Council and Cardiff City Council and is part of the development of the Enfys cycle network in Cardiff.

14.4.24 From Marshfield, the cycleway runs along Ty Mawr Lane to its junction with Church Lane. It then runs alongside Percoed Reen and crosses the route of the proposed new section of motorway near to Green Lane. To the north east of Green Lane and north of Percoed Reen, a new off-road section is under construction. This will link to Pencarn Lane and the roundabout on Duffryn Way, with links into the housing development to the north. The Cardiff section of this cycleway is expected to come forward for construction in 2016.

Other Routes Used by NMUs

14.4.25 There are a number of unclassified county roads, sometimes referred to as 'green lanes', together with undesignated informal routes within the study area that are used by pedestrians, cyclists and equestrians as follows.

- The un-named lane north of the A48 to the east of Junction 29 which lies immediately to the south of the proposed new section of motorway.
- An informal path that runs broadly parallel to the Duffryn Link from the A48 to the Church Road/Church Lane junction, where it runs along the alignment of public footpath 390/22 and would be crossed by the proposed new section of motorway. South of Church Lane it leaves the alignment of public footpath 390/22 about half way along the unused section of the Duffryn Link where it would be crossed by the proposed new section of motorway before it joins Percoed Lane opposite the entrance to Maerdy Farm.
- The track between the Church Road/Hawse Lane junction and Green Lane utilised by the Cardiff to Newport cycleway, which would be crossed by the proposed new section of motorway to the north of Maerdy Farm as described above.
- Percoed Lane between Green Lane and Pencarn Lane, which lies to the north of the proposed new section of motorway.
- Pencarn Lane, which lies to the north of the proposed new section of motorway.
- The track between Hawse Lane and Green Lane, south of the railway and the track leading south from this route to St. Brides Wentlooge, which lies to the south of the proposed new section of motorway.
- Picked Lane at Pye Corner which lies to the south of the proposed new section of motorway.
- The track to Tatton Farm which would be crossed by the proposed new section of motorway.
- Rush Wall from its junction with North Row to the east of Greenmoor Farm, which lies to the south of the proposed new section of motorway.
- The track between Rush Wall and Longlands Lane, which lies to the south of the proposed new section of motorway.

- The track between Whitewall to the south of Magor and Green Street, Summerleaze, which lies to the east of the proposed new section of motorway.
- Green Moor Lane, which would be crossed by the proposed new section of motorway to the immediate west of the A4810.
- The lane running south west from Knollbury to The Beeches, the southern part of which would be crossed by the new section of motorway.
- Windmill Lane north of the M48 at Llanfihangel, which would not be crossed by the proposed new section of motorway.

Public Rights of Way Surveys

14.4.26 The public rights of way surveys identified that all the surveyed routes, except the footpaths at Berryhill Farm, were well used by local residents and dog walkers and that NR4 was particularly popular with both local cyclists/runners and visitors to the area. The results of the survey can be found in the Public Rights of Way User Survey Report at Appendix 14.1.

14.4.27 Further survey data on NMU flows is presented in the NMU Context Report for the Scheme (see Appendix 14.2). These surveys were undertaken in May 2015 to observe trends in NMU activity within the vicinity of the proposed new section of motorway for a variety of route types, including roads, overbridges and public rights of way. Each route was surveyed on a single weekday and a Sunday, between 07:00 and 19:00.

14.4.28 The NMU Context Report concludes that, based on the results of the surveys, it can be observed that there is minimal equestrian activity on all routes in comparison to the prevalence of walkers and cyclists. The predominant NMU mode emerging from the surveys is the pedal cycle, which reflects the presence of the National Cycle Network running to the south of Newport. In addition, NMU activity is noticeably higher for all types at the weekend, suggesting that these routes are mainly utilised for recreational activity rather than commuting.

Public Highways

14.4.29 The local highway network between Junctions 23A and 29, together with the existing M4 and M48, provide links for motorised travellers between Newport, Magor and the other settlements within the study area, as well as strategic routes to Cardiff and beyond. Vehicle access to the existing Magor Services is via the existing Junction 23A circulatory carriageway.

14.4.30 NMUs are restricted to non-motorway routes, some of which have designated facilities for pedestrians and cyclists. These local roads are described below.

- The A48, which would be crossed by the proposed new section of motorway to the west of Berryhill Farm. There is a pedestrian footway along the road at this location.
- Pound Hill, the southern part of which would be within the proposed new section of motorway footprint. This road only has footway provision on the existing overbridge
- Church Road, which lies to the immediate north of the proposed new section of motorway and has no facilities for NMUs.

- Church Lane, which would be crossed by the proposed new section of motorway immediately to the south of its junction with Church Road. This road has no facilities for NMUs.
- The section of the Duffryn Link between the roundabout and Church Lane, which is not available to vehicular traffic, except for gated access to Maerdy Farm. This route is popular with dog walkers and would be within the footprint of the proposed new section of motorway.
- Green Lane, which would be crossed by the new section of motorway in two locations to the north of Maerdy Farm. This is a no through route.
- Lighthouse Road, which would be crossed by the proposed new section of motorway to the north of Fair Orchard Farm. This road has no facilities for NMUs.
- Corporation Road, which would be crossed by the new section of motorway in the Bird Port area. This has a highway footway on one side.
- Nash Road/Meadows Road, which would be crossed by the new section of motorway to the north of Pye Corner. There is footway provision along part of Meadows Road.
- The road linking the A4810 and North Row, which would be crossed by the proposed new section of motorway to the north of Greenmoor Farm. This road forms a link to part of an on-road section of NR4 but has no facilities for NMUs.
- Barecroft Common, which would be crossed by the proposed new section of motorway to the immediate east of the A4810 at Llandevenny. There is no specific NMU provision but there are grass verges.
- The B4245 Magor/Newport Road, which would be crossed by the proposed new section of motorway to the south of Junction 23A on the existing M4. This road has existing pedestrian footway provision.
- St Bride's Road, which would be crossed by the proposed new section of motorway to the north and south of the existing M4. This road only has footway provision within the existing underpass.
- Vinegar Hill, which would be crossed by the proposed new section of motorway to the north of the existing M4. This road only has footway provision on the existing overbridge.
- The Elms, which would be crossed by the proposed new section of motorway to the north of the existing M4. This road only has footway provision within the existing underpass.
- Bencroft Lane, which would be crossed by the proposed new section of motorway between the existing M48 and M4. This road only has footway provision within the existing underpass.
- Minnett's Lane north of the M48 at Llanfihangel, which is partly used and would be crossed by the proposed construction haul road from Ifton Quarry.

Overbridge and Underbridge Crossings

14.4.31 Public highways and public rights of way cross the existing M4 between Junctions 23A and 29 via a number of overbridges and underpasses. Those

within the study area running from west to east are listed below, all of which would be affected by the proposed new section of motorway.

- Junction 29 Castleton Interchange Overbridge.
- New Park Farm Footbridge.
- Pound Hill Overbridge.
- St Bride's Road Underbridge.
- Vinegar Hill Overbridge.
- The Elms Underbridge.
- Bencroft Lane Underbridge.

Public Transport and Bus Stops

14.4.32 Public transport between Cardiff, Newport, Magor and other local settlements is provided by national and local bus companies. Stagecoach Wales runs a number of routes to and from the centre of Newport, predominantly to the north and west, none of which would be affected by the proposed new section of motorway. The Stagecoach Wales routes from Cardiff include the X16 to Risca that passes through Castleton and along the A48 to Cleppa Park.

14.4.33 National coach services are operated by Megabus and National Express, which provide services linking Newport with destinations to the west including Cardiff and Swansea and destinations to the east including Chepstow, Bristol and London.

14.4.34 Newport Bus is the main local bus provider for the city. Newport Bus runs the following services within the study area.

- 34 service between Newport Bus Station and Celtic Springs Business Park via the Pont Ebbw Roundabout, Lighthouse Road and Duffryn Way.
- 74 service between Newport and Chepstow via Langstone, Llanmartin, Magor and Caldicot.
- X30 Newport to Cardiff via the M4.
- 'Demand Responsive Transport' service (pre-booked by the customer) for the area around Llanwern, Bishton and Redwick.
- 'Demand Responsive Transport' service for the rural area around Pye Corner, Broadstreet Common, Nash, Goldcliff and Whitson.
- 'Demand Responsive Transport' service for the area around Castleton, Marshfield and St Brides Wentlooge.

14.4.35 New Adventure Travel operates local bus services to and from Newport and Magor, including services to Duffryn High School via Lighthouse Road.

14.4.36 Monmouthshire County Council also runs bus services and a Grass Routes transport scheme that offers a responsive flexible bus service serving all the main towns, including Magor/Undy and outlying areas in the county.

14.4.37 The NMU Context Report provides a list of roads in the vicinity of the proposed new section of motorway that currently function as bus routes with bus stops. These include the following routes.

- A48 (including the Southern Distributor Road).
- Marshfield Road.
- Pencarn Way/Duffryn Way.
- Tredegar House Drive.
- Morgan Way.
- Cardiff Road.
- Docks Way.
- Alexandra Road.
- Corporation Road.
- Lighthouse Road.
- Nash Road.
- Lee Way.
- Queensway Meadows / A4810.
- Newport Road/Magor Road.

14.4.38 The existing M4 motorway also functions as a route for buses and coaches, although it is not permitted to board or alight from services on the motorway.

14.4.39 Rail services are available from Newport High Street, Pye Corner (Bassaleg), Severn Tunnel Junction (Rogiet) and Caldicot, all of which offer direct rail services to Cardiff. In addition, Newport High Street offers direct trains to London, Cwmbran, Abergavenny, Hereford, Manchester and North Wales. Caldicot serves direct trains travelling to Chepstow, Gloucester and Birmingham and, in addition, Severn Tunnel Junction offers direct trains travelling to Bristol, South West England and Portsmouth. Pye Corner at Bassaleg currently only offers direct trains to Cardiff or Ebbw Vale.

14.4.40 Welsh Government is delivering a new metro for South East Wales. This would comprise an integrated public transport network of light rail, trams, improved train services and faster buses by 2020 in Cardiff and the valleys. The project includes the electrification of the valleys rail lines; new and enhanced bus and light rail services from Cardiff through Newport to Llanwern; together with journey time and frequency improvements. The electrification of the South Wales to London Mainline railway from Cardiff through Newport and onwards to Bristol and London is a separate project, which would be crossed by the proposed new section of motorway in a number of places.

Traffic Data

14.4.41 The Transport Model for the Scheme has been developed to prepare traffic forecasts for the Scheme. These are documented in the Traffic Forecasting Report. The model represents the AM and PM peak periods on an average weekday for the design year of 2037, as follows.

- The AM peak hour (08.00 – 09.00).
- The PM peak hour (17.00 – 18.00).

14.4.42 The peak hourly flows for the design year are set out under the Assessment of Operational Effects below.

14.4.43 The baseline surveyed daily weekday average daily traffic flows on roads adjoining the proposed new section of motorway are set out in the NMU Context Report and summarised below.

- Coal Pit Lane, Castleton: 2050.
- Pound Hill, Castleton: 235.
- A48 Cardiff Road, Castleton/Newport: 15785.
- Church Lane, Newport: 748.
- B4239 Lighthouse Road: 3311.
- Corporation Road, Newport: 2561.
- Meadows Road, Newport: 3090.
- Rush Wall, Newport: 448.
- North Row, Newport: 1006.
- Bareland Street, Magor: 585.
- Green Moor Lane, Magor: 27.
- St. Brides Road, Magor: 846.
- B4245 Caldicot Road, Magor: 11914.
- Bencroft Lane, Magor: 62.

Future Baseline Conditions

14.4.44 The following baseline scenarios have been taken into consideration during the assessment of the Scheme, where appropriate.

- Construction stage: The start of construction – Spring 2018.
- Operational stage: A future year when the new M4 corridor would be open to traffic and the reclassification of the existing motorway is complete – Spring 2022.
- A design year, 15 years after opening – Spring 2037.

14.4.45 Potential changes to the baseline conditions may arise, for example, from changes to the definitive maps of public rights of way in Newport or Monmouthshire, initiatives coming forward arising from the Active Travel (Wales) Act 2013, other public transport proposals and new non-motorised user routes incorporated into new development schemes.

14.5 Mitigation Measures Forming Part of the Scheme Design

14.5.1 As set out in Chapter 2 and in Section 14.6 below, the Scheme includes permanent diversions for a number of routes that would be affected by the proposed new section of motorway. In addition, five new public bridleways and one new public footpath would be created as part of the Scheme. This includes a new bridleway running eastwards along Rush Wall from North Row to the

south of the new carriageway linking to the existing alignment of Barecroft Common, which would provide an off-road link between National Cycle Network Route 4 at North Row and Magor. Further details are provided within the assessment sections below.

14.5.2 Measures such as junction arrangements, signage and lighting form part of the design of the Scheme to minimise driver stress. The measures forming part of the Scheme (embedded mitigation) to maintain connectivity are described in Chapter 2 and in Sections 14.6 to 14.8 below.

14.5.3 Landscape and visual mitigation has been addressed as part of an iterative design and assessment process for the Scheme (e.g. woodland planting and other vegetation, boundary treatment).

14.6 Assessment of Potential Land Take Effects

14.6.1 The assessment of effects provided in this section takes into account the mitigation measures that are integral to the design of the Scheme, including the embedded mitigation measures described in this section.

Proposed New Section of Motorway

Public Rights of Way

14.6.2 The following public rights of way, or sections thereof, that fall within the permanent land take area for the proposed new section of motorway would be permanently stopped up (see Table 14.10 below). This would be undertaken during the construction stage and diversions that have been developed as part of the design of the new section of motorway would be put in place in all but one location to maintain the connectivity of the local network (see Figure 14.2 and Section 14.6). These diversions have been developed in consultation with Newport City Council and Monmouthshire County Council.

Table 14.10 Public Rights of Way within Permanent Land Take

PRoW Ref	Location	Land Take Effect
400/2; 400/10 and 400/11	Park Farm Footbridge	Sections of these public footpaths would be diverted to link to the new Park Farm Footbridge (SBR 0200) and to maintain linkages with the wider public rights of way network.
399/29	Between the existing M4 and the A48 to the north of Castleton	This public footpath would be within the area required for earthworks associated with the Castleton Interchange. No diversion would be put in place for this no-through route, which does not link to any other public rights of way.
390/11	North of the existing M4 and south of Gwaunshonbrown Farm	The western section of the public footpath would be diverted to run along the fence line of the new section of motorway to meet Pound Hill further to the north.
390/15	North of Longhouse Farm and The Conifers	The northern section of the public footpath would be diverted to run along the fence line of the new section of motorway to meet public footpath 390/12.
390/17	South of the A48	The south western section of the public footpath would be stopped up and the eastern section, to its junction with Church Lane, would remain on its

PRoW Ref	Location	Land Take Effect
		existing alignment and then be diverted along the fence line of the new section of motorway to the east and then to the north to meet the new roundabout on the Duffyn Link to the north of the new Church Lane Overbridge (SBR 0460) and then alongside Church Lane.
390/18	East of Ty'n y Brwyn	The northern section of the public footpath would be diverted to run parallel and south of its existing alignment adjacent to the proposed water treatment area.
390/22	East of Church Lane and south of the Duffryn Link	The public footpath would be diverted along the fence line of the new section of motorway to the west towards Church Lane and then south to meet the new Church Lane Overbridge (SBR 0460).
412/11	Along the track to New Dairy Farm to the east of Lighthouse Road	Sections of the Wales Coast Path and Newport Coast Path that run along the alignment of the public footpath would be diverted across the New Dairy Farm Overbridge (SBR 0805) in a similar position to the current alignment of the route. This diversion has been developed in consultation with Newport City Council and NRW and would provide a good viewing point for walkers.
401/4	South of the Solutia works	A section of the Wales Coast Path and Newport Coast Path that runs along the alignment of the public would be diverted around the supporting structure for the new River Usk Crossing (SBR 1000) and to the south of the new section of motorway to link with the remaining section that runs southwards, west of Pye Corner. This diversion has been developed in consultation with Newport City Council and NRW
372/92/1	West of the A4810	The eastern section of the public footpath would be diverted to the south to a point opposite the new alignment of Barecroft Common.
372/69/2, 372/69/5, 372/69/8, 372/69/10 and 372/69/11	North west of Magor	The public footpaths would be stopped up and diverted along the fence line of the new section of motorway as a public bridleway from public footpaths 372/12/4 and 372/86/1 on the north side of the existing M4 to meet St Bride's Road to the east.
372/85/1	North of the existing M4 and west of Magor Services	The southern part of the public footpath would be diverted to the west to meet public footpath 372/86/1.
372/12/4 and 372/86/1	Mill Reen culvert	The sections of these public footpaths at the extended Mill Reen culvert (SMN 2140) would be diverted to the west to meet the entrance to the extended culvert.
372/30/1 and 372/30/2	The Elms road north of the existing M4	The restricted byway which runs along a track from public footpath 372/29/1 to meet The Elms road would be diverted to the east along the fence line of the new section of motorway to meet Rockfield Road.

14.6.3 In addition to these permanent diversions, the following new routes would be created as part of the Scheme as an overall improvement of active travel measures.

- A new public footpath would be created along the fence line of the proposed new section of motorway, running from public footpath 400/1 eastwards to meet Pound Hill to the north of the existing M4.
- A new public bridleway would be created from Green Lane, to the south of the proposed new section of motorway, to run along the same alignment as the private means of access to Maerdy Farm to meet Percoed Lane on the southern side of the Percoed NMU Bridge.
- A new public bridleway would be created along the fence line of the proposed new section of motorway from public footpath 372/86/1 to the north of the existing M4 to meet St Bride's Road to the west.
- A new public bridleway would be created from public footpath 372/12/4 to the south of the existing M4 to meet St Bride's Road to the west.
- A new public bridleway would be created from public footpath 372/12/4 to the south of the existing M4 to meet Grange Road to the east.

14.6.4 The public rights of way located within the permanent land take for the Scheme would be permanently diverted along new alignments to maintain the connectivity of the network, with the exception of one public footpath (399/29, which comes to a dead-end and does not connect to the rest of the network). These public rights of way comprise a mixture of local routes, together with sections of the locally promoted Newport Coast Path and the nationally promoted Wales Coast Path. In addition, a number of new routes are proposed that would improve the network for all NMUs including horse riders and cyclists. The sensitivity of the local public rights of way, including the Newport Coast Path, is assessed to be low (i.e. of low or medium importance and rarity, local scale). The sensitivity of the Wales Coast Path is assessed to be high (i.e. of high importance and rarity, national scale). The magnitude of the impact on these resources is assessed to be minor beneficial as all affected routes, bar one, would be permanently diverted to maintain the connectivity of the local network and the network would also be improved by the addition of new lengths of public footpaths and bridleways that would provide new active travel facilities.

14.6.5 Taking these factors into account, the predicted environmental land take effects arising from the permanent stopping up and diversion of a section of the Wales Coast Path and local public rights of way, and the provision of new routes are assessed as permanent and of slight beneficial significance.

14.6.6 Any changes in the experience of those using routes that have been affected by the Scheme are described under 'Changes in Amenity' in Sections 14.6 and 14.7 of this chapter relating to construction and operational effects respectively.

Cycle Routes

14.6.7 National Cycle Route 4 (NR4), which is part of the national cycle network, would be permanently stopped up where it is crossed by the proposed new section of motorway on the eastern side of the River Usk between Traston Road and Pye Corner to the south of the Solutia works. This route would be diverted to the south. NR4 shares this section of the route with the Wales Coast Path and both

resources would continue to share the diverted route. This diverted route would begin near to the existing Solutia PCB cell and meet with the existing route at chainage 11,800. The public rights of way user survey found that on each of the three survey days, NR4 was well used with a high proportion of cyclists. NR4 also links to a number of on-road and traffic-free local routes.

14.6.8 A section of the Cardiff to Newport Cycleway, a new route for cyclists and pedestrians between the two cities, would be permanently stopped up where it is crossed by the proposed new section of motorway on the track alongside Percoed Reen, near to Green Lane and diverted across the Percoed NMU Bridge (SBR 0580) for all NMUs. The provision of the new bridge to ensure that the eastern and western sections of the cycleway are not severed from each other has been developed in consultation with Newport City Council and Sustrans. During construction, NMUs would continue to use the existing alignment of NR4 until the new bridge is operational. The public rights of way user survey at this location illustrates that this new NMU route is already popular with all types of users, including pedestrians and equestrians, with use likely to increase once the section between Green Lane and Duffryn is completed. However, some cyclists are not happy with the surfacing which they consider to be unsuitable for road bikes and this may impact on the number of cycling commuters using this route.

14.6.9 In addition to these existing resources, five new public bridleways would be created as part of the proposed new section of motorway, which would also be available for use by cyclists. One of these would run eastwards along Rush Wall from North Row to the south of the new carriageway, linking to Barecroft Common, along an alignment discussed with Newport City Council and Sustrans (Figure 14.3). This route would provide an off-road link between NR4 at North Row and Magor in accordance with the requirements of the Active Travel Act 2013 to enhance the provision for walkers and cyclists.

14.6.10 The sensitivity of NR4 is assessed to be high (i.e. of high importance and rarity, national scale) and medium for the Cardiff to Newport Cycleway (i.e. of high or medium importance and rarity, regional scale). The magnitude of the impact taking into account the effect on both these resources, including the proposals for their permanent diversion and the provision of additional routes, is assessed to be minor beneficial. Taking these factors into account, the overall predicted environmental land take effects on cycle routes are assessed to be permanent and of slight beneficial significance.

Other Routes Used by NMUs

14.6.11 Of the unclassified county roads and informal paths used by pedestrians, cyclists and equestrians, the following would be permanently stopped up (see Figure 14.2).

- A short length of the informal path that runs from the A48 to Church Lane would be within the area required for the new Church Lane Overbridge (SBR 0460) and associated works and would meet the new alignment of Church Lane instead of the existing alignment of public footpath 390/22. South of the unused section of the Duffryn Link, this path would be within the area required for the new section of motorway and would no longer be available for NMU access.

- That part of Green Lane which lies to the north of the South Wales to London Mainline railway would be within the area required for the proposed new section of motorway. There is no vehicular access from the northern part of Green Lane to other local highways but it was ascertained during consultation with Newport City Council and from the public rights of way user surveys that Green Lane is an important resource for NMUs especially equestrians. As a result, a new public bridleway has been incorporated into the design of the proposed new section of motorway. This would run from Green Lane along the same alignment as the new private means of access to Maerdy Farm to meet Percoed Reen to the south of the new section of motorway, thereby maintaining the connectivity of this NMU route.
- The southern part of the track to Tatton Farm running north from Broadstreet Common would be crossed by the proposed new section of motorway. Although this is identified as a recreational route on OS mapping, the route comes to a dead end and does not link with any other recreational resources.
- Part of Green Moor Lane would be crossed by the proposed new section of motorway to the immediate west of the A4810 and provides access for NMUs under the A4810 to link to linear routes to the west. Vehicular access to the allotments and agricultural land from the western edge of Magor would be maintained via the remaining length of Green Moor Lane to Kensington Park. NMU access under the new carriageway would be provided under the new Llandevenny Railway Underbridge on the north side of the tracks.
- The southern part of the lane running south west from Knollbury to The Beeches would be crossed by the proposed new section of motorway. This is also identified as a recreational route on OS mapping but comes to a dead end and does not link with any other recreational resources. An alternative route via the local road provides links to Knollbury and the public rights of way network to the north, and over the existing M4 to Grange Road and Vinegar Hill to the south.

14.6.12 The sensitivity of these routes is assessed to be low (i.e. of low or medium importance and rarity, local scale). Overall, the magnitude of the impact on these resources is assessed to be minor adverse considering the proposals that have been incorporated into the design to maintain the connectivity of NMU routes. Taking these factors into account, the predicted environmental land take effects on other routes used by NMUs are assessed to be permanent and of slight adverse significance.

Public Highways

14.6.13 The following local highways that fall within the permanent land take area for the proposed new section of motorway would be permanently stopped up, diverted or improved (see Figure 14.2).

- The southern part of Pound Hill between Gwaunshonbrown Farm and the A48, together with the existing Pound Hill Overbridge, which would be within the area required for the new Castleton Interchange and associated earthworks. The existing Pound Hill Overbridge would be demolished. Those requiring access to Penylan Farm and Gwaunshonbrown Farm, which have accesses onto Pound Hill to the north of the existing M4, would

have to travel north to meet the local road at Pen-y-lan and then go west to cross the M4 via Druidstone Road. Properties in Pen-y-lan and other settlements to the north would also have to use this route. Although there is provision for NMUs on the existing overbridge, there is no footway alongside the highway. As described above, the western part of public footpath 390/11 where it meets Pound Hill would also be permanently stopped up. Pedestrians would have to cross the existing M4 via the underpass to the south of Cefn Llogell to the east or via the new Park Farm Overbridge (SBR 0200) to the west.

- Church Lane at Coedkernew would be within the area required for the proposed new section of motorway and would be permanently stopped up and diverted across the new Church Lane Overbridge (SBR 0460). The overbridge, to include widened verges to accommodate pedestrians, would be constructed off-line and access to all properties and road users would be maintained during the construction phase until the overbridge is operational. There is no footway along either of these highways but NMUs could use the routes as they do presently.
- The southern section of Blacksmith Way at its junction with the Duffryn Link would be permanently stopped up and diverted via the new roundabout to tie into the new Church Lane Overbridge.
- The section of the Duffryn Link from the roundabout with Church Lane would be permanently stopped up. This section of highway is not currently available for use by vehicular traffic but does provide a gated access to Maerdy Farm. It is also popular with dog walkers. A new private means of access to the farm would be provided as part of the design of the proposed new section of motorway.
- The section of the B4239 Lighthouse Road to the north of Fair Orchard Farm would be permanently stopped up and diverted over the new Lighthouse Road Overbridge (SBR 0740) to the east. The new overbridge, which would include widened verges to accommodate pedestrians, would be constructed off-line and access to all properties would be maintained during the construction phase until the overbridge is operational. There is no footway along either of these highways but NMUs could continue to use Lighthouse Road as they do presently.
- The section of Nash Road and Meadows Road to the north of Pye Corner would be permanently stopped up and diverted over the new Nash Road Overbridge (SBR 1210) to the east. The new overbridge would be constructed off-line and access to all properties would be maintained until the overbridge is operational. NMUs could continue to use Nash Road and Meadows Road as they do presently and pedestrians could continue to use the existing footway during the construction phase.
- Broadstreet Common would be permanently stopped up between Pye Corner and the new Nash Road diversion and improved at its junction with the new highway. NR4 would continue to use the stopped up section of highway to maintain connectivity with the other parts of the route.
- The road linking the A4810 and North Row to the north of Greenmoor Farm would be permanently stopped up and diverted to the west over the new North Row Overbridge (SBR 1760) to meet the existing roundabout on the A4810. The current road forms a link between the existing local cycle route

along the A4810 and part of an on-road section of NR4 but has no facilities for NMUs. The new overbridge would be constructed off-line and current vehicular and NMu access arrangements would be maintained until the overbridge is operational.

- The western end of Barecroft Common from its junction with the A4810 would be permanently stopped up and diverted under the proposed new section of motorway to a new junction on the A4810.
- The western section of Green Moor Lane, from its junction with Llandeveyeny and under the existing A4810 and the proposed new section of motorway would be permanently stopped up. A footpath would be provided to link the remaining section of the lane to Llandeveyeny. Vehicles would access land to the south of the new section of motorway from the southern end of Green Moor Lane at its junction with Kensington Park.
- The B4245 Newport Road would be diverted offline to the east to a new roundabout junction. The new roundabout would be provided at the intersection of Newport Road and the A4810.
- To the east of Magor Services, a section of St Brides Road would be stopped up and diverted to the east and broadly along the same alignment to allow for extension of existing Magor Penhow Underbridge to carry the proposed new section of motorway over St Bride's Road.
- Knollbury Lane would be improved to allow for the construction of the Knollbury Lane Overbridge to carry existing road over the proposed new section of motorway and existing M4.
- The Elms, to the north of the proposed new section of motorway, would be stopped up and diverted to the west, broadly along the same alignment to allow for the extension of the existing underpass.
- That part of Bencroft Lane to the north of the M48 and between the M48 and the existing M4 would be within the area required for the new Magor Interchange. The section to the north of the M48 would be permanently stopped up and diverted to the south and the section between the two motorways permanently stopped up and re-aligned under the new junction structures to meet the B4245.

14.6.14 The proposed new section of motorway between Junctions 23 and 29 of the existing M4 would provide an additional resource to the strategic highway network in South Wales, together with two new public highways (Docks Link Road and Glan Llyn Road). The impacts on public highways once these routes are operational are assessed in Section 14.8 of this chapter.

14.6.15 The existing M4, M48 and the A48 are strategic routes of major importance in South Wales, linking Newport, Cardiff and Swansea with key settlements to the east including London and Bristol. The sensitivity of these strategic routes is therefore assessed to be high (i.e. of high importance and rarity, national scale). The other public highways linking to the strategic network are important at a local level and the sensitivity of these routes is therefore assessed as low (i.e. of low to medium importance and rarity, local scale).

14.6.16 The potential magnitude of the impact on these resources takes into consideration the maintenance of public access along the strategic network and the provision of diversions for most local roads, or parts thereof, that would be

permanently stopped up, in accordance with measures that have been incorporated into the design of the proposed new section of motorway. It also takes account of the adverse effects on local journeys from the stopping up of Pound Hill, an important local connection, and the benefit to access within the southern part of Newport from the creation of two new public highways. The magnitude of the impact is therefore assessed to be minor adverse i.e. vehicular and NMU access along the strategic network and most local roads, including diverted sections, would be maintained to ensure the connectivity of journeys for all travellers.

- 14.6.17** Taking these factors into account, the predicted environmental land take effects on public highways are assessed to be permanent and of slight adverse significance.

Overbridge and Underbridge Crossings

- 14.6.18** Public highways and NMU routes, including public rights of way, cross the existing M4 between Junctions 23A and 29 via a number of overbridges and underpasses. The potential land take effects on these crossings are listed below.

- Park Farm Footbridge would be within the area required for the new Castleton Interchange and would be replaced by a new bridge to the west. During the construction phase the existing bridge would remain in place until the new Park Farm Footbridge (SBR 0200) is operational. This would ensure that NMU access across the bridge via the existing public footpath network (including 400/1 to 400/3 and 400/8 to 400/11) would be maintained.
- Castleton Interchange Overbridge (Links A (SBR 0245), B (SBR 0360) and C (SBR0355)) would be built adjacent to the structure that it is required to replace over the existing M4 motorway. Traffic flow would be maintained on the existing M48 and three lanes in both directions of the existing M4, except when the new bridge deck is installed. As the overbridge would be constructed on a different alignment from the existing bridge, no traffic management would be required for traffic using the existing M48. Traffic flow on the existing A48 would be maintained under traffic management with closures only required for installation of the new bridge deck.
- The existing Pound Hill Overbridge would be in the area required for the new Castleton Interchange and would be permanently stopped up and demolished as described above.
- Newport Road Overbridge (SBR 2080) at the junction of the B4245 and A4810, would be constructed off-line from the existing Newport Road and would be completed prior to traffic being diverted. A foot/cycle facility would be provided at grade with the proposed roundabout to allow NMUs (including those on the carriageway) to negotiate the roundabout safely, together with a grade separated route using the existing B4245 underbridge to cross the A4810.
- The existing Magor Penhow Underbridge, through which St Bride's Road runs, would be within the area required for the new Junction 23A and would be extended. The new structure would be known as the St Bride's Road

Underbridge (SBR 2120A) and would extend the existing underbridge to the north and the south.

- The existing Knollbury Lane Overbridge would be within the area required for the new carriageway and would be extended to the north during the construction works.
- The existing Rockfield Road Underbridge (SBR 2265) would be within the area required for the new carriageway and would be extended to the north during the construction works.
- The existing Bencroft Lane Underbridges would be within the area required for the new Magor Interchange and would be reconfigured between the existing M48 and B4245.

14.6.19 In addition to works associated with the existing crossing points described above, a number of new crossings would be delivered as part of the proposed new section of motorway to maintain the connectivity of the local highway network as set out below.

- The A48 Underbridge Westbound (SBR 0370) and Eastbound (SBR 0375) at chainage 3,725 would carry the westbound and eastbound carriageways of the proposed new section of motorway over the A48. Traffic flow would be maintained along the existing A48 under traffic management, except during the installation of the bridge deck.
- The Church Road Overbridge (SBR 0460) at chainage 4,625 would provide vehicular and NMU access across the proposed new section of motorway. This would be constructed between the Duffryn Link, at its junction with the re-aligned Church Lane, just to the north of the Parc Golf Club. As described under 'Public Highways' above, the overbridge would be constructed off-line and access to all properties and road users would be maintained along the existing highway until the overbridge is operational.
- The Percoed NMU Bridge (SBR 0580) at chainage 5,775 would provide NMU access across the proposed new section of motorway, including for the Cardiff to Newport Cycleway. The bridge would be constructed off-line and access along the cycleway would be maintained until it is operational.
- The Lighthouse Road Overbridge (SBR 0740) at chainage 7,350 would provide vehicular and NMU access across the new section of motorway. This would be constructed between the retained section of Lighthouse Road to the south of the South Wales to London Mainline railway near to Whitecross Farm and Fair Orchard Farm to the south. As described under 'Public Highways' above, the overbridge would be constructed off-line and access to all properties and road users would be maintained until the overbridge is operational.
- The New Dairy Farm Overbridge (SBR 0805) at chainage 8,025 would provide farm access to New Dairy Farm and pedestrian access along the re-aligned Coast Path/Newport Coast Path. As the overbridge would be constructed off-line, vehicular and NMU access would be maintained along the existing alignment of the farm access track and Wales Coast Path until the bridge is operational.
- The River Ebbw Underbridge (SBR 0850) at chainage 8,500 would carry the proposed new section of motorway, the westbound merge slip and the

eastbound diverge slip over the River Ebbw. Details of the new underbridge are contained in the Chapters 2 and 3 of this ES.

- The River Usk Crossing (SBR 1000) at chainage 10,200 would carry the proposed new section of motorway over the River Usk and Newport Docks. Full details of this cable-stayed structure are set out in Chapters 2 and 3 of this ES.
- The Nash Road Overbridge (SBR 1210) at chainage 12,575 would provide vehicular and NMU access across the proposed new section of motorway, along the re-aligned Nash Road. This would be constructed between Meadows Road near to its junction with Nash Mead and Nash Road to the south of Pye Corner near Fair Orchard. As described under 'Public Highways', the overbridge would be constructed off-line and access to all properties and road users would be maintained until the overbridge is operational.
- The Glan Llyn Junction Overbridge West and East (SBR 1465 and 1470) at chainages 14,625 and 14,700 would be constructed to form a new junction over the proposed new section of motorway. It would not impact on the maintenance of traffic flows on adjacent roads.
- The North Row Overbridge (SBR 1760) at chainage 17,550 between the A4810 and North Row would provide vehicular access across the proposed new section of motorway. As described under 'Public Highways', the overbridge would be constructed off-line and access to all properties and road users would be maintained until the overbridge is operational.
- The Bareland Street Underbridge (SBR 1980) at chainage 19,800 between the A4810 and Barecroft Common would provide vehicular and NMU access across the proposed new section of motorway, along the re-aligned Barecroft Common. The new structure would be built off-line and the existing road would remain in use until the new underbridge is operational.
- The Magor Interchange, including the Magor Interchange Bridge (SBR 2295), Caldicot Underbridge 1 (SBR 2360A) and Llanfihangel Underbridge (SBR 2365) at Junction 23 and 23A of the existing M4 is the eastern end of the proposed new section of motorway. The aim of the highway design at this location has been to reduce traffic through Magor and improve accessibility, including to Severn Tunnel Junction railway station. The major bridges would be constructed off-line to minimise the impacts on the existing highway network.

14.6.20 The underpass and overbridge crossings of the existing M4 provide important vehicular and NMU links between the more sparsely populated area to the north and the main settlements of Newport and Magor to the south. With the exception of the overbridge at Pound Hill, these links would be maintained as part of the design of the new section of motorway and, where possible, existing underpasses and overbridges would remain open until the new structures are completed and operational. In addition, new structures would be constructed to provide safe vehicular and NMU access across the new carriageway and maintain links between local roads and settlements. Most of these are to be constructed off-line to enable access to be maintained until the new structures are operational. The sensitivity of all travellers using these crossings is assessed to be high in relation to the strategic network and low in relation to the local network. The magnitude of the impact on these receptors is assessed to

be minor adverse. With the exception of Pound Hill, there would be limited impacts on local journeys.

- 14.6.21** Taking these factors into account, the predicted land take effects arising from the alteration of existing structures and the construction of new overbridge and underbridge crossings are assessed to be permanent and of slight adverse significance.

Public Transport and Bus Stops

- 14.6.22** No land take effects on public transport services are predicted but two bus stops (one north-bound and one south-bound) on Nash Road, to the north and south of the proposed new section of motorway would be affected. These would be re-located on the new section of Nash Road as part of the Scheme.

Community Severance

- 14.6.23** The DMRB methodology for assessing community severance specifically relates to any increases in the length of journeys of pedestrians using public rights of way, cycle routes and public highways during the opening year of the Scheme. However, it is noted here that during the development of the design for the new section of motorway, measures have been incorporated to ensure that the network of NMU resources is maintained, where possible, and improved as a result of the Scheme. Potential land take effects on community severance are therefore limited, with the closure of Pound Hill and the permanent stopping up of a short length of public footpath (399/29) (which is a dead-end and does not link with other public rights of way) being the main effects. The stopping up of Pound Hill would result in significantly longer journeys for pedestrians crossing the existing M4 in a north-south direction and these are assessed in the assessment of community severance during the operation of the Scheme in Section 14.8 of this chapter.

Complementary Measures

- 14.6.24** The Complementary Measures for the Scheme include the following.
- Improvements to safety, access arrangements and the ability to manage traffic by reclassifying the existing M4 between Magor and Castleton as a trunk road.
 - Relief to Junction 23A of the existing M4 and the local road network with a new M4/M48/B4245 connection (considered above)
 - Providing cycle and walking friendly infrastructure.
- 14.6.25** The cross section of the existing M4, in terms of number of lanes and widths of lanes, would be maintained except for the following sections.
- From Junction 23A to Junction 24 the cross section would be reduced to two lanes in both directions. The existing Lane 1 and hard shoulder would be hatched out of use by road markings.
 - From Junction 24 to Junction 25, the cross section on the westbound carriageway would be reduced to two running lanes. The existing Lane 1 would be hatched out of use by road markings. The eastbound carriageway

would have three lanes to accommodate climbing vehicles on the steep gradient of St Julian's Hill.

- Through Junction 28, the cross section would be reduced to two lanes in both directions. The existing Lane 1 and hard shoulder would be hatched out of use by road markings.

14.6.26 The east facing connections from Junction 25A to the existing M4 would be closed and traffic routed through Junction 25 to join/leave the motorway via the east facing slip roads of Junction 25. The westbound diverge slip road for Junction 25 would be widened within the highway boundary to provide additional capacity via a new retaining wall built within the footprint of the existing motorway. On the western side, new connecting slip roads would be constructed between the Junction 25 and 25A link roads and the motorway. These new slip roads would allow eastbound traffic using the existing motorway to access Junction 25 and Caerleon Road and would allow westbound access to the existing motorway from Junction 25 and Caerleon Road.

14.6.27 These measures do not require any additional land take areas over and above those discussed for the new section of motorway above. Therefore there would be no additional potential land take effects that would affect All Travellers.

14.7 Assessment of Potential Construction Effects

14.7.1 The assessment of effects provided in this section takes into account the mitigation measures that are integral to the design of the Scheme, including the embedded mitigation measures described in this section.

Proposed New Section of Motorway

Public Rights of Way

14.7.2 Those public rights of way that fall within the footprint of the proposed new section of motorway, junctions and associated earthworks that would be permanently stopped up during the construction phase are set out in Section 14.6. In addition, some public rights of way would need to be temporarily stopped up to allow for works on the carriageway, junctions, bridges and NMU crossings to be undertaken, or where they fall within temporary construction or storage areas or within temporary construction traffic arrangements. These are discussed below.

Temporary Effects on Public Rights of Way

14.7.3 The public rights of way that would be temporarily stopped up or subject to traffic management during the construction stage are listed in Table 14.11 below and shown on Figure 14.2.

Table 14.11: Public Rights of Way Temporarily Affected During Construction

PRoW Ref	Location	Temporary Effect
390/11	The western end of the public footpath to its junction with Pound Hill within the temporary construction area.	The permanent diversion of this section of the public footpath would be temporarily stopped up.
390/15	The southern part of the public footpath would be within a temporary construction area to the south and the mitigation land.	This part of the public footpath would be temporarily stopped up.
390/17	The northern section of the public footpath would be within the mitigation land to the north of the new section of motorway.	This part of the public footpath would be temporarily stopped up.
390/18	The public footpath, from its junction with public footpath 390/15 to its junction with footpaths 390/14 and 390/23 would be between the permanent land take area and the construction area to the south and west.	This public footpath would be temporarily stopped up.
399/25	The western part of the track along which public footpath runs from the A48.	Track used for construction access to the new water treatment area and traffic management would be put in place.
399/50	Along track between the new Bryn Ivor Lodge Care Home and the Castleton Grow Your Own site.	Track used for construction access and traffic management would be put in place.
401/4	A section of the public footpath along which the Wales Coast Path and Newport Coast Path runs to the east of the River Usk, under the railway and to the south of the Solutia works, up to that section of the same public footpath that would be permanently stopped up as part of the Scheme.	The part of the public footpath along which the Wales Coast Path and Newport Coast Path runs would be temporarily stopped up.
372/12/4	Public footpath through Mill Reen culvert.	The public footpath would be temporarily stopped up during the construction of the new Mill Reen Culvert (SBR 2140).

14.7.4 The public rights of way affected by the construction works comprise local routes, together with sections of the nationally promoted Wales Coast Path and locally promoted Newport Coast Path. The sensitivity of the public rights of way affected by the construction works is therefore assessed to be low for local routes and the Newport Coast Path (i.e. of low or medium importance and rarity, local scale for the local routes) and high (i.e. of high importance and rarity, national scale) for the Wales Coast Path. The magnitude of the impact on these resources is assessed to be major adverse in relation to the Wales Coast Path and Newport Coast Path as the temporary stopping up of sections of these

routes would adversely affect the integrity of the routes as a whole. The magnitude of impact of the local public rights of way is assessed to be moderate adverse i.e. there would be some temporary impacts that would affect the public's ability to access some well used local routes. Alternatives are available but generally require lengthy diversions.

- 14.7.5** Taking these factors into account, the predicted effects arising from the temporary stopping up of public rights of way during construction are assessed to be temporary and medium term and of large adverse significance in relation to the Wales Coast Path. Effects are assessed to be temporary and medium term and of slight adverse significance in relation to local routes and the Newport Coast Path.

Cycle Routes

Temporary Effects on Cycle Routes

- 14.7.6** A section of NR4, which runs along the same route as the Wales Coast Path and Newport Coast Path to the south of the Solutia works, would be temporarily stopped up during the construction works associated with the River Usk Crossing. This would require cyclists to use an alternative on-road route that would result in increased journey length.
- 14.7.7** The sensitivity of NR4 is assessed to be high (i.e. of high importance and rarity, national scale) and the magnitude of the impact is assessed to be moderate adverse i.e. the integrity of the national route would be temporarily affected but alternatives would be available. Taking these factors into account, the overall predicted construction effects on cycle routes are assessed to be temporary and of moderate adverse significance in the medium term.

Other Routes Used by NMUs

Temporary Effects on Other Routes Used by NMUs

- 14.7.8** There would no temporary effects on other routes used by NMUs crossed by the proposed new section of motorway during construction.

Public Highways

Temporary Effects on Public Highways

- 14.7.9** The existing strategic highway network including the M4, M48 and A4810 would remain open during the construction phase under traffic management where required, except for overnight weekend road closures required during the installation of the new bridge structures and overnight lane closures that may be required for traffic management installations, utility diversions and new road tie-ins and surfacing. At these times diversion routes would be put in place. For other public highways crossed by the proposed new section of motorway, except those listed below, traffic flow would be maintained with temporary road closures only permitted when bridge construction or demolition works are being undertaken. Closure of the B4245 would only be permitted overnight. Further details of these arrangements are contained in Appendix 3.1 of this ES.
- 14.7.10** Those local highways that would be temporarily stopped up during the construction phase to enable extension works to be undertaken to existing

overbridge and underbridge crossings and for construction access are listed in Table 14.12 below. These closures would be coordinated to ensure that adequate north-south diversion routes are available.

Table 14.12: Local Highways Temporarily Stopped Up of During Construction

Highway	Construction Impact
St Bride's Road	It is anticipated that the road would be closed for public use for the duration of the construction phase of the Scheme (approximately 4 years) for utilities protection, haul road and bridge structure works. Temporary diversion routes would be via the B4245, A4810 and a temporary road behind Magor Services to reduce the length of the diversion.
Knollbury Lane	The road would be closed for public use for a period of approximately 1 year during the construction of the Knollbury Lane Overbridge 2 (SBR 2205) and utilities diversions. Temporary diversion routes would be via Vinegar Hill, the B4245, the Elms and the Rockfield Lane Underbridge, which would not be closed at the same time.
Rockfield Lane	The road would be closed for public use for a period of approximately 1 year during the construction of the Rockfield Lane Underbridge 2 (SBR 2265). Temporary diversion routes would be via the Elms, the B4245, Vinegar Hill and Knollbury Lane Overbridge, which would not be closed at the same time.
Bencroft Lane	The road would be subject to day/night closures for public use during the realignment of the road. Temporary diversion routes would be via the B4245, the Elms and Rockfield Lane, which would not be closed at the same time.

14.7.11 Construction access to the River Usk and River Ebbw bridge crossings would use the M4 and A48, with Corporation Road and Stephenson Street used to access the eastern construction compound for the River Usk Crossing.

14.7.12 The M4, M48 and the A48 are strategic routes of major importance in South Wales, linking Newport, Cardiff and Swansea with key settlements to the east including London and Bristol. The sensitivity of these strategic routes is therefore assessed to be high (i.e. of high importance and rarity, national scale). The other public highways linking to the strategic network are important at a local level and the sensitivity of these routes is therefore assessed as low (i.e. of low to medium importance and rarity, local scale).

14.7.13 The sensitivity of these roads and the potential magnitude of the impact on them are set out in Table 14.13 below.

Table 14.13: Sensitivity of, and Magnitude of Impact on, the Strategic and Local Highway Network during Construction

Highway	Sensitivity	Magnitude of Impact
M4	High	Minor Adverse: Would remain open under traffic management where required except for some overnight weekend road closures or overnight lane closures.
M48	High	Minor Adverse: Would remain open under traffic management where required except for some overnight weekend road closures or overnight lane closures.
A4810	High	Minor Adverse: Would remain open under traffic management where required except for some overnight lane closures.
B4245	Low	Minor Adverse: Would remain open under traffic management where required except for some overnight lane closures.
St Bride's Road	Low	Moderate Adverse: Would be closed for the duration of the construction phase of the Scheme (approximately 4 years) with temporary diversions.
Knollbury Lane	Low	Moderate Adverse: Would be closed for public use for a period of approximately 1 year with temporary diversions.
Rockfield Lane	Low	Moderate Adverse: Would be closed for public use for a period of approximately 1 year with temporary diversions.
Bencroft Lane	Low	Minor Adverse: Would be subject to day/night closures.

14.7.14 The magnitude of the impact on these resources takes account of the maintenance of public access along the strategic network and some local roads throughout the construction stage, except for some overnight weekend road and lane closures when traffic flows are lower and diversions would be in place. It also reflects the potential increase in the length of, and disruption to, local north-south journeys as a result of the temporary stopping up and diversion of the local highways at the Magor end of the proposed new section of motorway.

14.7.15 Taking these factors into account, the predicted effects on public highways during the construction phase are assessed to be temporary, medium term and of slight to moderate adverse significance in relation to the strategic network and the local road network.

Overbridge and Underpass Crossings

14.7.16 Public highways and public rights of way cross the existing M4 between Junctions 23A and 29 via a number of overbridges and underpasses. The potential impacts on these crossings during the construction phase are listed below. Temporary closures at these crossing points would be coordinated to maintain north-south access for vehicles and NMUs.

- The construction of the Castleton Interchange Overbridge (Links A (SBR 0245), B (SBR 0360) and C (SBR0355)) would require the closure of the existing M4 motorway and the A48 trunk road for the installation of the new bridge deck. These closures would only be permitted overnight at a weekend.

- The existing Park Farm Footbridge would be demolished once the new structure to the west (SBR 0200) has been completed and is open to NMUs. This would be demolished during a total overnight weekend closure of the existing M4.
- During the construction of the A48 Underbridge Westbound (SBR 0370) and Eastbound (SBR 0375), traffic flow would be maintained along the existing A48 under traffic management, except for the installation of the bridge deck which would require full closures of the road. These closures would only be permitted overnight at a weekend.
- During the construction of the Newport Road Overbridge (SBR 2080), traffic management would be required on the existing Newport Road to allow passage of site traffic.
- Access along St Bride's Road and through the existing Magor Penhow Underbridge would be subject to temporary closures and diversions during the construction of the St Bride's Road Underbridge (SBR 2120A).
- Access through Mill Reen Culvert along public footpath 372/12/3 would be subject to temporary stopping up and diversion. This would be coordinated with construction works on the St Bride's Road Underbridge and the Knollbury Lane Overbridge.
- Access along Knollbury Lane and across the existing Knollbury Lane Overbridge would be subject to temporary closures and diversions during the construction of the new Knollbury Lane Overbridge (SBR 2205).
- Access along Rockfield Lane and through the existing Rockfield Lane Underbridge would be subject to temporary closures and diversions during the construction of the new Rockfield Lane Underbridge (SBR 2265).
- Access along Bencroft Lane and through the existing Bencroft Lane Underbridges would be subject to temporary closures and diversions during the construction of the Bencroft Lane Underbridges (SBR 2340A, 2360B).

14.7.17 In addition to construction works associated with the existing crossing points described above, a number of new crossings would be delivered as part of the proposed new section of motorway as described above in Section 14.6. The following overbridges and underbridges would be constructed off-line and therefore any potential effects on All Travellers would be minimised.

- Church Lane Overbridge (SBR 0460).
- Percoed NMU Bridge (SBR 0580).
- Lighthouse Road Overbridge (SBR 0740).
- New Dairy Farm Overbridge (SBR 0805).
- Nash Road Overbridge (SBR 1210).
- North Row Overbridge (SBR 1760).
- Bareland Street Underbridge (SBR 1980).

14.7.18 Construction traffic associated with the construction of the River Ebbw Underbridge (SBR 0850) would access the site from the east and west of the River Ebbw.

- 14.7.19** The construction of the River Usk Crossing would take place from two compounds to the east and west of the River Usk. The western compound would be accessed from a new independent access off the A48, which would also give access to the east side of the River Ebbw Underbridge. The eastern compound would be accessed from the existing M4 at Junction 24, the A48 and then along Corporation Road, Stephenson Street, Mariner Way, Broad Quay Road and East Bank Road.
- 14.7.20** The Magor Interchange and associated structures (the Magor Interchange Bridge (SBR 2295), Caldicot Road Underbridge 1 (SBR 2360A) and Llanfihangel Underbridge (SBR 2365)) would be constructed in two sections - Magor East (Junction 23) and Magor West (Junction 23A). During the construction phase, traffic management would be put in place to maintain current traffic flows and lanes on the existing M4 and the B4245 where possible and to minimise overnight and off peak road/lane closures, as described above under 'Public Highways'.
- 14.7.21** The underpass and overbridge crossings of the existing M4 provide important vehicular and NMU links between the more sparsely populated area to the north and the main settlements of Newport and Magor to the south. There would be a requirement for the temporary closure of some local roads during the construction of some new or extended structures but these would be coordinated to ensure that north-south connectivity is maintained. There would also be full closures of the existing M4, A48 and B4245 during the installation of some bridge decks but the timing of these would be controlled. There would also be traffic management on those roads affected by the construction works or used by construction traffic. The sensitivity of these crossings, which cross the strategic and local road network, is assessed to be high in relation to the M4, M48 and A48 trunk road and low in relation to the local road network. The magnitude of the impact on these resources takes into consideration the programming of construction works to ensure that public access is available to most of the existing structures during the construction phase. It is therefore assessed to be minor to moderate adverse i.e. there would be some temporary loss of vehicular and NMU access across existing structures at certain times and the construction of new structures may also impact on local journeys but coordinated diversions would be established where required, and traffic management measures would also be put in place along affected routes.
- 14.7.22** Taking these factors into account, the predicted effects on underpass and overbridge crossings during the construction works are assessed to be temporary, medium term and of slight to moderate adverse significance in relation to crossings of the strategic network and the local road network.

Public Transport and Bus Stops

- 14.7.23** Public transport between Cardiff, Newport, Magor and other local settlements is provided by national and local bus companies. No regular bus services would be disrupted during the construction phase since most run along roads or those sections of roads that would be unaffected. For example, the Newport Bus 34 service (between Newport Bus Station and Celtic Springs Business Park via Lighthouse Road and Duffryn Way) runs along roads to the north of the new carriageway and the X30 service uses the existing M4.

- 14.7.24** The Stagecoach Wales X16 route from Cardiff to Risca passes through Castleton and along the A48 to Cleppa Park. Two-way traffic along the strategic highway network, including the A48, would be maintained at all times during construction, except for managed closures during the installation of the Castleton Interchange and A48 bridge decks. The operation of this bus route would therefore continue during the construction phase.
- 14.7.25** The 'Demand Responsive Transport' services, generally serving the rural areas to the south of the proposed new section of motorway may have to find alternative routes but they, together with all the other bus companies providing a service that may be affected by the construction works, would be regularly informed of possible road closures and alternative arrangements to ensure the continuity of bus services.
- 14.7.26** It is not predicted that there would be any effects on the use of bus stops on the roads in the vicinity of the proposed new section of motorway, including the A48. The existing bus stops on Nash Road, one north-bound and one south-bound, would continue to be available for use until the new Nash Road diversion is in place. Thereafter, two new bus stops on Nash Road would be available for use.
- 14.7.27** Details of the interface with Network Rail in relation to the of the two underbridges over the South Wales to London Mainline at Duffryn (Coedkernew) and Llandeenny (Magor) and construction works in close proximity to Network Rail's Uskmouth spur line which feeds Uskmouth Power Station are set out in Appendix 3.1 of this ES. This explains that sections of the railway track would be closed to allow construction activities to be undertaken safely whilst minimising disruption to the train network. Network Rail can grant two types of possessions on this line in this respect - Rules of Route (generally two tracks out of the available four tracks are blocked and this can be up to eight hours over night mid-week) and Disruptive Possessions (generally only permitted at Easter and Christmas and give a full 52 hour working window). Network Rail have indicated that Disruptive Possessions would not be granted simultaneously at Duffryn and Llandeenny Bridges as passengers would incur additional journey times needing to travel via road from Cardiff to Bristol and the resulting journey time is considered to be too long. It has also been noted that any blockade request would need to be viewed in the wider context to consider passengers travelling from Paddington to South Wales to ensure there are no additional clashes resulting in passengers having to travel by road in more than one location. Therefore it is predicted that there would be some disruption to rail services along the South Wales to London Mainline during the construction period, including travel by replacement bus services, but these are likely to be restricted to off-peak overnight or Bank Holiday closures.
- 14.7.28** It is not predicted that there would be any effects on the new metro for South East Wales project during the construction of the proposed new section of motorway.
- 14.7.29** The sensitivity of the public transport resources serving the Newport area taking into account the local and wider services provided by the bus and rail companies is assessed to be medium (i.e. high or medium importance and rarity, regional scale). The magnitude of the impact on these resources is assessed to be minor adverse.

14.7.30 Taking these factors into account, the predicted environmental effects on public transport and bus stops during the construction phase are assessed to be temporary, medium term and of slight adverse significance.

Changes in Amenity

14.7.31 Changes in the overall amenity of journeys made by All Travellers during the construction phase are largely a factor of changes to the visual and noise environments, which are assessed in detail in Chapters 9 and 13 respectively of this ES. In accordance with DMRB methodology in relation to changes in amenity, a commentary of the relevant sections of those assessments is set out below.

14.7.32 The landscape and visual assessment describes the potential construction visual effects on public rights of way along the route of the new section of motorway. At the Castleton end of the route the construction of the Castleton Interchange would be a dominant visual element for users of public footpaths closest to the works as a result of extensive woodland clearance in this area, with views becoming more filtered with distance and due to intervening topography and vegetation. Uninterrupted views of construction activity would also be gained from that part of the Wales Coast Path running to the west of the River Ebbw, including construction of the River Usk Crossing which would be viewed in the context of the industrial nature of Newport Docks. Around the Glan Llyn junction, views of construction activities from public rights of way would be limited, as they would from routes to the south of Magor. Views of the construction activities would be possible from public rights of way to the north of Magor and from the north of the existing M4 due to the removal of screening vegetation. The assessment also describes visual changes experienced by road users during the construction phase, which generally are predicted to be more limited due to traffic speeds and screening vegetation or surrounding buildings.

14.7.33 Temporary changes to the noise environment during construction are set out in Appendix 13.3 and would predominantly be experienced by NMUs. This assessment shows that for daytime works, when most NMU journeys take place, the level of impact from a range of construction activities would obviously reduce with distance from the activity. Significant effects could occur within approximately 115 metres from the construction activity, which would be temporary and occur only during the most intense periods of construction. Therefore, non-motorised user journeys along public rights of way, cycle routes or alongside roads close to the construction activities would be subject to increased noise levels over the baseline environment, although these would change as journeys progress due to the transient nature of the activity.

Driver Stress

14.7.34 The DMRB driver stress methodology does not specifically include a consideration of the potential effects on drivers resulting from the construction activities associated with a highway project, including road closures, diversions and disruption to journeys and journey times. However, there are likely to be increased levels of driver stress during this period, compared to the baseline situation. This may be due to frustration i.e. by a driver's inability to drive at a speed consistent with his or her own wishes or as a result of traffic congestion

and delays caused by traffic management, or because of uncertainty relating to the route being followed where temporary construction diversions are in place.

Community Severance

- 14.7.35** During the construction phase for the proposed new section of motorway, measures would be put in place to maintain the connectivity of the highway network used by NMUs (see Appendix 3.1). 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 Tables 14.11 and 14.12 above. Taking these factors into account, the predicted environmental construction effects on community severance are assessed, using the DMRB three point scale, as moderate i.e. some residents may be dissuaded from making trips and some trips would be made longer or less attractive.

Complementary Measures

- 14.7.36** The Complementary Measures would not require any additional temporary land take during construction. Most of the works, including those required to the existing diverge and merge slips to accommodate the predicted changes in traffic flow, would be undertaken within the existing highway boundary or utilising areas of permanent and temporary land take already identified for the Scheme. The construction of NMU friendly infrastructure and the connections between the M48, M4 and B4245 are described above. The construction works associated with the remainder of the Complementary Measures would only commence once the Scheme is operational.
- 14.7.37** Any effects on the amenity of roads and NMU routes arising from the provision of NMU friendly infrastructure and the connections between the M48, M4 and B4245 are described under the assessment of construction effects for the new section of motorway above.

14.8 Assessment of Potential Operational Effects

- 14.8.1** The assessment of effects provided in this section takes into account the mitigation measures that are integral to the design of the Scheme, including the embedded mitigation measures described in this section.

Proposed New Section of Motorway

Public Rights of Way

- 14.8.2** On completion of the construction phase, those public rights of way that were partly or fully stopped up on a permanent basis would have been diverted, except for public footpath 399/29, which runs from the A48 and does not link to any other highway i.e. it is a dead-end. Those that were partly or fully stopped up temporarily during the construction phase would have been reinstated along their original alignment. In addition, the new routes created as part of the Scheme would be operational.
- 14.8.3** The public rights of way within the local network around the proposed new section of motorway comprise a mixture of local routes, together with sections of the locally promoted Newport Coast Path and the nationally promoted Wales

Coast Path. The sensitivity of these public rights of way is therefore assessed to be low (i.e. of low or medium importance and rarity, local scale) for the local routes, including the Newport Coast Path and high (i.e. of high importance and rarity, national scale) for the Wales Coast Path. The magnitude of the impact on these resources is assessed to be no change in relation to the Wales Coast Path and Newport Coast Path, the integrity of which would be maintained as a result of their permanent diversion. The impacts would be minor beneficial for local routes i.e. all affected public rights of way, except for one, would be permanently diverted and additional public rights of way would be available for NMUs which would improve the connectivity of the local network and provide additional active travel opportunities.

- 14.8.4** Taking these factors into account, the predicted effects arising from the operation of the Scheme on the Wales Coast Path would be neutral and of permanent and slight beneficial significance in relation to local public rights of way.

Cycle Routes

- 14.8.5** During the operational phase of the Scheme all existing local cycle routes and the unaffected sections of NR4, which is part of the national cycle network, would continue to be available along their existing alignments. That part of NR4 to the east of the River Usk permanently diverted as part of the Scheme would run along the same alignment as the Wales Coast Path i.e. around the supporting structure of the new River Usk Crossing and to the south of the new carriageway to link with the remaining section of NR4 at Pye Corner. The Cardiff to Newport Cycleway would run along a permanent diversion over the Percoed NMU Bridge (SBR0580) during the operational phase, maintaining connectivity with the other sections of the cycleway to the east and west.

- 14.8.6** In addition to these existing resources, five new public bridleways would be created as part of the proposed new section of motorway that would be available for use by cyclists. One of these would run eastwards along Rush Wall from North Row to the south of the new carriageway, linking to the existing alignment of Barecroft Common. This route would provide an off-road link between NR4 at North Row and Magor.

- 14.8.7** The sensitivity of NR4 is assessed to be high (i.e. of high importance and rarity, national scale), while the sensitivity is medium for the Cardiff to Newport Cycleway (i.e. of high or medium importance and rarity, regional scale) and low for the new public bridleways available for cyclists, which would predominantly be local routes. The magnitude of the impact resources during the operational phase is assessed to be minor beneficial. Taking these factors into account, the overall predicted operational effects on cycle routes are assessed to be permanent and of slight beneficial significance.

Other Routes Used by NMUs

- 14.8.8** Measures have been incorporated into the design of the proposed new section of motorway to address the permanent stopping up of those unclassified county roads and informal paths used by pedestrians, cyclists and equestrians. These measures, as set out in Section 14.6 and Table 14.14 below, would be available for use by NMUs during the operational phase.

Table 14.14: Other Routes Used by NMUs during the operation of the Scheme

Route	Description
Informal path that runs from the A48 to Church Lane	During operation this route would meet the new alignment of Church Lane instead of the alignment of public footpath 390/22.
Green Lane	During operation NMUs would use the new public bridleway from Green Lane to meet Percoed Reen to the south of the new section of motorway.
Tatton Farm	This dead-end route would not be available during operation.
Green Moor Lane	Access for NMUs would be maintained under the new section of motorway and the A4810 to link to routes to the west.
Lane running south-west from Knollbury to The Beeches	The southern part of the lane comes to a dead end and does not link with any other recreational resources.

14.8.9 The sensitivity of these routes is assessed to be low (i.e. of low or medium importance and rarity, local scale). Overall, the magnitude of the impact on these resources is assessed to be negligible considering the proposals that have been incorporated into the design of the Scheme to maintain the connectivity of routes used by NMUs. Taking these factors into account, the predicted operational effects on other routes used by NMUs are assessed to be permanent and of neutral significance.

Public Highways

14.8.10 The strategic highway network including the proposed new section of motorway, the existing M4, the M48 and the A48 would be fully open during the operational phase, together with local roads linking to those routes (including the new Docks Link Road and the Glan Llyn Link Road) and serving the population of Newport, Magor and outlying settlements.

14.8.11 The existing M4 between Junction 23 at Magor and Junction 29 at Castleton, which would be re-classified as a trunk road, is described under 'Complementary Measures'.

14.8.12 The proposed new section of motorway is an approximately 23 km long three lane motorway that would pass south of Newport, crossing the Gwent Levels, River Usk, Newport Docks, the Llanwern Steelworks site and passing close to the Docks Way landfill site. The new road would take approximately 30-45% of traffic and most of the Heavy Goods Vehicles (HGVs) from the existing M4. The existing M4 would continue to carry traffic connecting north of Newport, such as to the A4042 and A449. The proposed new section of motorway has been designed with a 120 kilometres per hour design speed and would have a mandatory 70 miles per hour enforced speed limit for all of its length. The speed limits at either end of the new section of motorway are generally 70 mph, with the exception of the toll booth area associated with the Second Severn Crossing. Further details are provided in Chapters 2 and 3 of the ES and in the Traffic Forecasting Report for the Scheme. The aims of the Welsh Government for the Scheme include making it easier and safer for people to access their homes, workplaces and services by walking, cycling, public transport or road. In

this regard, the Traffic Forecasting Report describes the benefits of the Scheme for through traffic in terms of '*significant journey time savings due to the shorter distance and reduced congestion levels*' (section 9.6). In addition, it states that there would be reduced volumes of traffic using the existing M4 between Junctions 23 and 29, resulting in a reduction in journey times in both directions on that route during all times of day.

14.8.13 In addition to the proposed new section of motorway, the following public highways would be created as part of the Scheme. Further details are provided in Chapters 2 and 3 of the ES.

- Docks Link Road running north from the Docks Way Junction to meet the A48, providing access to Newport Docks and the central southern area of Newport from the strategic highway network.
- Glan Llyn Link Road running from the new Glan Llyn Junction to meet the A4810, providing access to the existing and new residential and commercial areas in south Newport from the strategic highway network. Improvements are proposed to the existing combined foot/cycleway at the roundabout on the A4810, including suitable crossing facilities for the arms of the roundabout for non-motorised users.

14.8.14 The following public highways would be permanently diverted as part of the Scheme as set out in Section 14.6 and would be available for All Travellers during the operational phase.

- Church Lane at Coedkernew would be permanently diverted across the new Church Lane Overbridge. The overbridge would incorporate widened verges for pedestrians.
- The southern section of Blacksmith Way would be permanently via the new roundabout to tie into the new Church Lane Overbridge.
- The section of the B4239 Lighthouse Road to the north of Fair Orchard Farm would be permanently diverted over the new Lighthouse Road Overbridge to the east. The overbridge would incorporate widened verges for pedestrians.
- The section of Nash Road and Meadows Road to the north of Pye Corner would be permanently diverted over the new Nash Road Overbridge to the east. The overbridge would incorporate a footway for pedestrians.
- The road linking the A4810 and North Row to the north of Greenmoor Farm would be permanently diverted over the new North Row Overbridge to meet the existing roundabout on the A4810.
- The B4245 Newport Road would be permanently diverted to the new roundabout at the intersection with the A4810, with the new footway enabling pedestrians to cross the B4245/A4819 without needing to negotiate the roundabout.
- St Brides Road would be permanently diverted to the north of the Magor Penhow Underbridge.
- The Elms would be permanently diverted to the north of the Scheme.

- That part of Bencroft Lane to the north of the M48 and between the M48 and the existing M4 would be permanently diverted to the south and re-aligned under the new junction structures to meet the B4245.

14.8.15 Pound Hill would be permanently stopped up, which would result in changes to access arrangements for All Travellers. Travellers from Penylan Farm and Gwaunshonbrown Farm, which have accesses onto Pound Hill to the north of the existing M4, would have to travel north to meet the local road at Pen-y-lan and then go west to cross the M4 via Druidstone Road. Travellers from properties in Pen-y-lan and other settlements to the north would also have to use this route. Pedestrians would have to cross the existing M4 via the underpass to the south of Cefn Llogell to the east or via the new Park Farm Overbridge to the west.

14.8.16 During operation, access to the existing Magor Services would be via the existing Junction 23A circulatory carriageway.

14.8.17 The existing M4, M48 and the A48 are strategic routes of major importance in South Wales, linking Newport, Cardiff and Swansea with key settlements to the east including London and Bristol. The sensitivity of these strategic routes is therefore assessed to be high (i.e. of high importance and rarity, national scale). The other public highways linking to the strategic network are important at a local level as they generally facilitate local rather than long distance travel, and the sensitivity of these routes is therefore assessed as low (i.e. of low to medium importance and rarity, local scale).

14.8.18 The potential magnitude of the impact on these resources takes into consideration the operation of the new section of motorway, which would predominantly serve a strategic role, the maintenance of public access along the rest of the strategic network, improvements to access within the southern part of Newport and reduced journey times and congestion. It also takes account of the provision of permanent diversions for those local roads that would be permanently stopped up or affected during the construction phase. The magnitude of the impact is therefore assessed to be moderate beneficial i.e. vehicular and NMU access along the strategic network and most local roads, including diverted sections, would be maintained to ensure the connectivity of journeys for all travellers and, the new section of motorway and connecting new highways would result in reduced journey times and congestion and would provide additional vehicular access to the southern areas of Newport, including Newport Docks and new developments at Glan Lyn.

14.8.19 Taking these factors into account, the predicted operational effects on public highways are assessed to be permanent and of moderate beneficial significance, which is significant in EIA terms.

Overbridge and Underbridge Crossings

14.8.20 All existing crossings that would not be permanently stopped up as part of the new section of motorway and all new overbridge and underbridge crossings that would be fully open during the operational phase are as follows.

- New Park Farm Footbridge (SBR 0200).
- Castleton Interchange Overbridge (Links A (SBR 0245), B (SBR 0360) and C (SBR0355)).

- A48 Underbridge Westbound (SBR 0370) and Eastbound (SBR 0375).
- Church Lane Overbridge (SBR 0460).
- Percoed NMU Bridge (SBR 0580).
- Lighthouse Road Overbridge (SBR 0740).
- New Dairy Farm Overbridge (SBR 0805).
- River Ebbw Underbridge (SBR 0850).
- River Usk Crossing (SBR 1000).
- Nash Road Overbridge (SBR 1210).
- Glan Llyn Junction Overbridge West and East (SBR 1465 and 1470).
- North Row Overbridge (SBR 1760).
- Bareland Street Underbridge (SBR 1980).
- Newport Road Overbridge 2 (SBR 2080).
- St Bride's Road Underbridge (SBR 2120A).
- Knollbury Lane Overbridge (SBR 2205).
- Rockfield Road Underbridge 2 (SBR 2265).
- Bencroft Lane Underbridge 1 and 3 (SBR 2340A, 2360B).
- Magor Interchange Bridge (SBR 2295).
- Caldicot Road Underbridge 1 (SBR 2360A).
- Llanfihangel Underbridge (SBR 2365).

14.8.21 The underpass and overbridge crossings of the existing M4 provide important vehicular and NMU links between the more sparsely populated area to the north and the main settlements of Newport and Magor to the south and, with the exception of the overbridge at Pound Hill, these links would be fully open during the operational phase. In addition, new structures would be constructed to provide safe vehicular and NMU access across the new carriageway to maintain links between local roads and settlements and for travellers using the strategic network of South Wales.

14.8.22 The sensitivity of All Travellers using these crossings is assessed to be low i.e. they would generally be used by people accessing the local road network. The magnitude of the impact on these receptors, with the exception of Pound Hill, is assessed to be negligible as crossing points on the existing M4 would remain the same and new crossing points would facilitate access over the new section of motorway to replace the existing links. There would be an adverse impact on Pound Hill but this would not affect the overall integrity of the local highway network, although some journey times would be affected as set out above.

14.8.23 Taking these factors into account, the predicted operational effects on all travellers using existing and new overbridges and underbridges are assessed to be permanent and of neutral significance.

Public Transport and Bus Stops

- 14.8.24** Public transport services, including rail services, and bus stops would continue to function as they do presently and therefore there would be no effects arising from the operation of the proposed new section of motorway.

Changes in Amenity

- 14.8.25** Changes in the overall amenity of journeys made by All Travellers during the operational phase is largely a factor of changes to the visual and noise environments, which are assessed in detail in Chapters 9 and 13 respectively of this ES. In accordance with DMRB methodology in relation to changes in amenity, a commentary of the relevant sections of those assessments is set out below.
- 14.8.26** The landscape and visual assessment describes the potential visual effects on public rights of way along the route of the new section of motorway during operation. At the Castleton end of the route, the Castleton Interchange would initially be the dominant visual element for users of public footpaths closest to the new section of motorway, but these views would return to baseline conditions by year 15 when mitigation planting would have matured and would largely screen and integrate this part of the Scheme into its surroundings.
- 14.8.27** Visibility of the new section of motorway would also be gained from public rights of way around the Berryhill Farm area. Woodland planting would screen large parts of the new section of motorway but would itself change the visual amenity of the area. Further away views would vary depending on the presence and nature of intervening elements.
- 14.8.28** Open views of the proposed new section of motorway would also be available from the Church Lane Overbridge, which would largely be screened by woodland planting by year 15, although traffic passing under the bridge would be visible.
- 14.8.29** Uninterrupted views of the proposed new section of motorway would be gained from that part of the Wales Coast Path running to the west of the River Ebbw, including the River Usk Crossing which would be a notable feature representing a positive contribution to visual amenity which would add interest to the views, being a higher quality and more aesthetically pleasing feature than the surrounding industrial buildings and chimneys. Users of the Wales Coast Path and NR4 around Pye Corner would be in close proximity and would see clear details of the underside of the deck and supporting structures of the River Usk Crossing. As there is no screen planting associated with the River Usk Crossing and the elevated sections of motorway leading to it, there would be no change to these views in year 15.
- 14.8.30** There would be limited impacts on the visual amenity of public rights of way within Newport including around the Glan Llyn junction. Users of the new bridleway from at Rush Wall would be in close proximity with intermittent views north to the new section of motorway, and there would also be views from routes within or on the edge of Magor which would largely be screened by woodland planting by year 15. Users of public rights of way to the north of the existing M4 corridor at Magor would initially see moving traffic on the new section of motorway and the M48 along with lighting, signs and gantries, but

these would change to glimpsed and filtered views by year 15 as the proposed extensive woodland planting matures.

14.8.31 The landscape and visual assessment also describes visual changes experienced by road users during the operational phase, which generally are predicted to be more limited and fleeting due to traffic speeds and screening vegetation or surrounding buildings. Similarly, no significant visual effects are predicted for train travellers due to the very fleeting nature of these views.

14.8.32 Changes to the noise environment during the operation of the Scheme are set out in Appendix 13.4. This assessment shows that in operation, both beneficial and adverse noise effects are predicted as a result of the Scheme. The new section of motorway would reduce congestion on the existing M4 and therefore there would generally be a reduction in noise impacts on NMU receptors around the existing motorway corridor. Conversely, the proximity of a new motorway to NMU resources to the south of Newport would result in higher noise levels over the baseline environment being experienced by the users of those resources, although these would change as journeys progress due to the transient nature of the activity. Noise mitigation to reduce those impacts has been incorporated into the Scheme by the provision of a thin road surface system, which results in relatively low noise. In addition, noise barriers are proposed where appropriate.

Driver Stress

14.8.33 As set out in Section 14.4, the Transport Model has been developed to prepare traffic forecasts for the Scheme, which is documented in the Traffic Forecasting Report. The model represents the AM and PM peak periods on an average weekday for the design year of 2037, as follows.

- The AM peak hour (08.00 – 09.00).
- The PM peak hour (17.00 – 18.00).

14.8.34 The modelled peak hourly vehicle flows along the most heavily trafficked three lanes of the new section of motorway for the design year (2037) are as follows.

- Eastbound
 - AM peak hour: 2,900
 - PM peak hour: 2,800.
- Westbound
 - AM peak hour: 3,000
 - PM peak hour: 3,400.

14.8.35 The peak hourly flow on each lane therefore ranges from approximately 930 to 1,130 units per hour. The DMRB guidance in relation to driver stress on motorways indicates that average peak flows of under 1,200 units per hour at an average journey speed of over 95 km/hr would lead to a low level of driver stress.

14.8.36 The modelled peak hourly vehicle flows along the most heavily trafficked three lane sections of the existing M4 between Junctions 23 and 29 for the design year (2037) for the Scheme are as follows.

- Eastbound
 - AM peak hour: 4,000
 - PM peak hour: 4,100
- Westbound
 - AM peak hour: 4,700
 - PM peak hour: 3,700

14.8.37 The peak hourly flow on each lane therefore ranges from approximately 1,230 to 1,560 units per hour. The DMRB guidance in relation to driver stress on motorways indicates that average peak flows of between 1,200 and 1,600 units per hour at an average journey speed of over 95 km/hr would lead to a moderate level of driver stress. A Do-Minimum scenario would result in peak hourly flows on each lane of between 1,533 to 1,733 units per hour, which DMRB guidance indicates would lead to moderate to high levels of driver stress at an average journey speed of over 95 km/hr.

14.8.38 The modelled peak hourly vehicle flows along the A48 Southern Distributor Road (SDR) for the design year (2037) for the Scheme are as follows.

- Eastbound
 - AM peak hour: 1,700.
 - PM peak hour: 1,700.
- Westbound
 - AM peak hour: 1,700.
 - PM peak hour: 1,800.

14.8.39 The peak hourly flow on each lane therefore ranges from 850 to 900 units per hour. The DMRB guidance in relation to driver stress on dual carriageways indicates that average peak flows of under 1,200 units per hour at an average journey speed of 80 km/hr (approximately 50 miles/hour) would lead to a moderate to low level of driver stress, with levels of driver stress rising to high for those sections of the A48 with speed limits under 60 km/hr (approximately 37 miles/hr). A Do-Minimum scenario would result in peak hourly flows on each lane of between 950 to 1,050 units per hour, which would not change the levels of driver stress indicated in the DMRB guidance.

14.8.40 The improvements to the strategic highway network would also reduce driver stress as a result of the following.

- Reduced frustration, with fewer delays, due to the new section of motorway.
- Reduced frustration as a result of the reduction in vehicle flows along the existing M4 leading to more overtaking opportunities, reducing congestion.
- Reduced frustration as a result of improved road surfacing with reduced spray and noise generation along the new section of motorway.
- Reduced fear brought about by improved sight distances.
- A reduction in peak hour traffic flows along the A48 SDR.

- A signage strategy for the Scheme is being developed which would, *inter alia*, seek to reduce driver uncertainty.

Community Severance

- 14.8.41** As set out in Section 14.3 of this chapter, community severance is defined in DMRB Volume 11, Section 3, Part 8 (Highways Agency, 1993a) 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*’ (para 5.2).
- 14.8.42** The direct effects during the operational phase are set out above. This illustrates that most existing highway and NMU resources, including road crossings, would be maintained during the operational phase and that new structures would provide safe access across the new section of motorway for All Travellers. This would ensure that local journeys would be largely unaffected by the operation of the new section of motorway and that people would not be severed from community facilities.
- 14.8.43** Only at Pound Hill would an alternative route need to be taken by vehicular traffic and NMUs wishing to cross the existing M4. As set out Section 14.6 above, vehicles would have to travel north to meet the local road at Pen-y-lan and then go west to cross the M4 via Druidstone Road, a maximum increase in journey length of around 6 km. Pedestrians would have to cross the existing M4 via the underpass to the south of Cefn Llogell to the east, an increase in journey length of around 2 km or via the New Park Farm overbridge to the west, an increase in journey length of around 3.6 km. The number of people affected by this change in journey would be the residents of, and visitors to, the limited number of properties located on the retained section of Pound Hill to the north of the existing M4 and potentially the residents in the small hamlet of Pen-y-lan, as well as recreational walkers.
- 14.8.44** The DMRB guidelines apply specifically to any increases in the length of journeys of pedestrians. For most NMU journeys, there would be minor changes to routes and crossing points, with the exception of those arising from the stopping up of Pound Hill. Taking these factors into account, it is assessed that community severance arising from the operation of the new section of motorway would be slight in relation to most NMU journeys i.e. in general the current journey patterns are likely to be maintained, but there would be some hindrance to movement. In relation to the stopping up of Pound Hill and resulting increase in journeys lengths for NMUs it is assessed that community severance arising from the operation of the new section of motorway would be severe i.e. NMU journeys would increase by over 500 metres and it is likely that some people, particularly vulnerable groups such as children or the aged, would be deterred from making trips. However, as this would affect residents of, or visitors to, a small number of properties this is unlikely to have an impact on centres of activity or community resources.

Complementary Measures

- 14.8.45** The Complementary Measures would not require any additional permanent land take during operation that could impact on All Travellers.
- 14.8.46** During operation, the existing M4 would be downgraded to an all-purpose standard trunk road. The existing Variable Speed Limit would continue to

operate along the existing M4 between Junction 24 (Coldra) and Junction 28 (Tredegar Park), but with a maximum speed limit of 60 miles per hour imposed at the Brynglas Tunnels.

- 14.8.47** During operation, the east facing connections from Junction 25A to the existing M4 would be closed, and traffic would be routed through Junction 25 to join/leave the motorway via the east facing slip roads of Junction 25. The widened westbound diverge slip road for Junction 25 would provide additional capacity, and on the western side, there would be new connecting slip roads between the Junction 25 and 25A link roads and the motorway. These new slip roads would allow eastbound traffic to access Junction 25 and Caerleon Road and would allow westbound access to the existing motorway from Junction 25 and Caerleon Road. The slip roads and link roads would continue to be subject to a 40 mph speed limit. The circulatory carriageway of Junction 25 would be signalised at all entries.
- 14.8.48** The operation of NMU friendly infrastructure and the connection between the M48, the M4 and the B4245 would be primarily delivered by the new section of motorway as described above.
- 14.8.49** The operation of the Complementary Measures has the potential to permanently affect the amenity of roads and NMU routes. Where appropriate, these are assessed in detail in Chapters 9 and 13 of this ES and summarised below.
- 14.8.50** The sensitivity of All Travellers using the Complementary Measures is assessed to be medium in relation to both the reclassified local strategic network and access to local settlements from the re-modelled junctions. The magnitude of the impact on these receptors is assessed to be minor beneficial i.e. there would be benefits to journeys along and from the local strategic network, particularly for those living in the Caerleon area.
- 14.8.51** Taking these factors into account, the predicted operational effects on all travellers using the Complementary Measures are assessed to be permanent and of slight beneficial significance.

14.9 Additional Mitigation and Monitoring

Construction

- 14.9.1** During the construction of the River Usk Crossing, the section of the Wales Coast Path that runs to the east of the River Usk from the western end of Stephenson Street to the Solutia site, would be temporarily stopped up and a temporary diversion put in place. This diversion would start from the junction of Corporation Road and Stephenson Street and run south along Corporation Road before turning east into Traston Road. From the non-vehicular section of Traston Road, the temporary diversion would run southwards through the fields to the east of the Solutia Works to Nash Road and then run south to join the existing alignment of the route to the west of Pye Corner. This temporary diversion, which is slightly shorter in length than the existing route, has been developed in consultation with Newport City Council and Natural Resources Wales.

14.9.2 NR4 shares part of the route of the Wales Coast Path past the Solutia works and would also be temporarily diverted during the construction of the River Usk Crossing. Cyclists following NR4 in this location would take the same route as pedestrians using the Wales Coast Path diversion, but on Traston Road would follow the non-vehicular section to the end and meet Nash Road further north. They would then travel down Nash Road to join the existing alignment of NR4 at Pye Corner. This temporary diversion, which would be slightly longer than the existing route, has been developed in consultation with Newport City Council and Sustrans.

14.9.3 The following temporary diversions of public rights of way would be put in place during the construction phase of the Scheme.

- A temporary link would be provided between St Bride's Road, to the south of Gwaunshonbrown Farm, and public footpath 390/11.
- A temporary link running along the western boundary of the construction land to link public footpath 390/15 to 390/14.
- Pedestrians would temporarily be diverted along Church Road between public footpaths 390/17 and 390/23.

14.9.4 The maintenance of access along public highways and traffic management commitments during the construction stage of the Scheme to manage driver and public safety are set out in Chapter 3 and Appendix 3.1. No additional construction mitigation measures are required in relation to public highways.

14.9.5 Mitigation measures during the construction period would be detailed in, and delivered through, the Construction Environmental Management Plan (CEMP) and Construction Transport Management Plan for the Scheme. This would include traffic management measures to manage driver and public safety and minimise disruption to the public and the local and strategic road networks. It would also include measures to keep the public informed on the programming and length of construction works affecting local highways and NMU routes. A Pre-CEMP is provided at Appendix 3.2.

14.9.6 Mitigation has been addressed as part of an iterative design and assessment process in relation to landscape and visual impact and no additional or further mitigation measures during construction have been proposed. Likewise, noise mitigation has been incorporated into the Scheme.

Operation

14.9.7 Measures such as junction arrangements, signage and lighting form part of the design of the Scheme to minimise driver stress. The measures forming part of the Scheme (embedded mitigation) to maintain connectivity are described in Chapter 2 and in Sections 14.5 to 14.7 above. No further operational mitigation measures are proposed in relation to All Travellers in addition to those incorporated into the Scheme.

14.9.8 As stated above landscape and visual mitigation has been addressed as part of an iterative design and assessment process for the Scheme (e.g. woodland planting and other vegetation, boundary treatment) and no further measures are proposed. In relation to noise, mitigation has also been incorporated into the Scheme design.

Monitoring

- 14.9.9** Monitoring of mitigation measures that have been developed in relation to All Travellers would be undertaken via the suite of pre-construction documents that would be prepared for the Scheme, including the Construction Environmental Management Plan and the Construction Traffic Management Plan. Permanent changes to the highway network including public rights of way and other NMU routes would be implemented through the Side Road Orders.

14.10 Assessment of Land Take Effects

New Section of Motorway

- 14.10.1** The design of the new section of motorway includes permanent diversions for most of the public rights of way, cycle routes and other NMU routes affected by the new section of motorway, highway diversions and new and replacement overbridges and underbridges. The assessment of land take effects with mitigation in place would therefore remain as set out in Section 14.6 above.

Complementary Measures

- 14.10.2** The Complementary Measures do not require any additional land take areas over and above those required for the new section of motorway. Therefore, there would be no additional potential land take effects with mitigation in place that would affect All Travellers.

14.11 Assessment of Construction Effects

Proposed New Section of Motorway

Public Rights of Way

- 14.11.1** Further mitigation measures would be put into place to provide temporary diversions for those public rights of way affected during the construction of the new section of motorway, including the Wales Coast Path and Newport Coast Path. The magnitude of impact on these resources with these measures in place is therefore assessed to be negligible i.e. the integrity of the routes would be maintained and whilst part of the diversion for the Wales Coast Path and Newport Coast Path would be along public highways, there would be a slight decrease in the length of pedestrian journeys.
- 14.11.2** Taking these factors into account, the predicted residual environmental effects on public rights of way from the construction works are assessed to be temporary, medium term and of neutral significance.

Cycle Routes

- 14.11.3** Mitigation measures would also be put into place to provide a temporary diversion for that part of NR4 affected during the construction of the River Usk Crossing. The magnitude of impact on this route with these measures in place is therefore assessed to be minor adverse i.e. the integrity of the route would be maintained but the diversion would comprise an on-road route (compared to a

traffic free section on the existing route) and would result in longer pedestrian and cycle journey times.

- 14.11.4** Taking these factors into account, the predicted residual effects on cycle routes from the construction works is assessed to be temporary, medium term and of slight adverse significance.

Other Routes Used by NMUs, Public Highways, Overbridge & Underbridge Crossings and Public Transport and Bus Stops

- 14.11.5** No further mitigation measures would be put in place for these resources during the construction phase, in addition to those incorporated into the design of the new section of motorway. Therefore, the assessment of effects set out in Section 14.7 above would not change.

Community Severance

- 14.11.6** The further mitigation measures for public rights of way and cycle routes during the construction phase set out above would help to mitigate for temporary impacts on pedestrian journeys, although there would still be some hindrance to movement, particularly for north-south journeys across the existing M4 including those using the local roads. 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 to moderate.

Driver Stress

- 14.11.7** There would be no change to the assessment of driver stress set out in Section 14.7.

Complementary Measures

- 14.11.8** There would be no additional construction effects resulting from the provision of NMU friendly infrastructure, other than those described above for the Scheme. The construction of the other Complementary Measures would not commence until the Scheme is operational and a construction strategy for these works has yet to be developed.

14.12 Assessment of Operational Effects

Proposed New Section of Motorway

- 14.12.1** No further mitigation measures would be put in place in relation to all travellers' resources or driver stress during the operation phase. The assessment of operational effects is therefore unchanged from those set out in Section 14.8 above.

Complementary Measures

- 14.12.2** There would be no additional operational effects resulting from the provision of NMU friendly infrastructure, other than those described above for the Scheme. The operation of the other Complementary Measures would not commence until the Scheme is operational.

14.13 Assessment of Cumulative and Inter-related Effects

14.13.1 The assessment of cumulative effects relating to All Travellers and of inter-relationships between topics is presented in Chapter 17 of this ES.

14.14 Summary of Effects

14.14.1 In addition to the road network linking Newport, Magor and Castleton with the settlements to the north of the M4 and the outlying small settlements of the Gwent Levels to the south, pedestrians, cyclists and equestrians have access to a network of public rights of way. The proposed new section of motorway would affect a number of these routes, predominantly used for informal recreation by pedestrians and cyclists.

14.14.2 One national route, the Wales Coast Path, together with the length of the Newport Coast Path that runs along the same alignment, would be affected by the proposed new section of motorway to the west of the River Ebbw and to the east of the River Usk. The proposed new section of motorway would also cross the National Cycle Network Route 4, a long distance route between London and Fishguard, which forms the main option of the Celtic Trail East cycle route passing through Newport, parts of which are traffic-free. Consultation has been undertaken with Newport City Council, Monmouthshire County Council, Natural Resources Wales and Sustrans in relation to these resources and measures that have been incorporated into the Scheme to minimise the impacts on them.

14.14.3 A number of site visits together with user surveys were undertaken to establish the baseline conditions for this range of resources used by pedestrians, cyclists and equestrians.

14.14.4 Some routes used by pedestrians, cyclists and equestrians would require stopping up on a temporary basis during construction or on a permanent basis where they fall within the permanent land take for the Scheme. During both phases diversion routes would be established for most routes to enable users to access other parts of the local network and to maintain connectivity between routes.

14.14.5 Taking into account the measures incorporated into the Scheme for the diversion of permanently affected routes and the mitigation measures proposed to provide temporary diversions for those public rights of way and cycle paths affected during construction, including the Wales Coast Path and Newport Coast Path, no significant adverse effects on public rights of way, cycle paths or other routes are predicted.

14.14.6 During construction, the existing M4, M48 and A4810, together with most local roads crossing the Scheme or linking to it, would remain open under traffic management, where required, except for some overnight weekend road and lane closures during the installation of the new bridge structures and other works such as utility diversions. However, several local highways would be temporarily stopped up to enable extension works to be undertaken to existing overbridge and underbridge crossings and for construction access. Although temporary diversion routes would be put in place there is likely to be a significant adverse effect on users of local roads due to disruption to north-south journeys in the Magor area and the potential increase in the length of

some journeys. This, together with the temporary impacts on public rights of way and cycle routes used by pedestrians, would result in a construction effect on community severance i.e. some residents may be dissuaded from making trips and some trips would be made longer or less attractive. However, this effect would be temporary and for the duration of construction only.

14.14.7 Following the completion of the construction works, the connectivity of the public rights of way network would be maintained. Those routes that were partly or fully stopped up on a permanent basis would have been diverted, except for public footpath 399/29, which runs from the A48 and does not link to any other highway i.e. it is a dead-end. Those that were partly or fully stopped up temporarily during the construction phase would have been reinstated along their original alignment. In addition, the five new public bridleways and one new public footpath created as part of the Scheme would be operational. This includes a new bridleway running eastwards along Rush Wall from North Row to the south of the new carriageway linking to the existing alignment of Barecroft Common, which would provide an off-road link between National Cycle Network Route 4 at North Row and Magor.

14.14.8 The strategic and local highway network in the area, together with the existing overbridge and underpass crossings of the existing M4 provide important links for the settlements located on either side of the road. Where possible, these would remain open during the construction period until the new structures are completed and operational, under traffic management where required. In addition to the new section of motorway, the following two new public highways would be provided as part of the Scheme, together with new overbridges or underbridges.

- Docks Link Road running north from the Docks Way Junction to meet the A48, providing access to Newport Docks and the central southern area of Newport from the strategic highway network.
- Glan Llyn Link Road running from the new Glan Llyn Junction to meet the A48, providing access to existing and new residential and commercial areas in south Newport from the strategic highway network.

14.14.9 Public transport services, including rail services, and bus stops would continue to function as they do presently and therefore there would be no effects arising from the operation of the Scheme. However, there would be some disruption to rail services along the main line during the construction period, including travel by replacement bus services, but these are likely to be restricted to off-peak overnight or Bank Holiday closures.

Table 14.15: Summary of Likely Environmental Effects on All Travellers

Activity/ Receptor	Sensitivity of receptor	Description of impact	Short / medium / long term	Magnitude of impact (without mitigation)	Significance of effect (without mitigation)	Magnitude of impact (with mitigation)	Significance of effect (with mitigation)	Significant / Not significant
Land Take								
Public Rights of Way: Wales Coast Path	High	Stopping up and diversion of part of this route.	Permanent	Minor Beneficial	Slight Beneficial	Minor Beneficial	Slight Beneficial	Not significant
Public Rights of Way: Other Routes	Low	Permanent stopping up or diversion of section of routes and provision of new routes.	Permanent	Minor Beneficial	Slight Beneficial	Minor Beneficial	Slight Beneficial	Not significant
Cycle Routes	High (N 4) Medium (Cardiff to Newport Cycleway)	Section of routes to be stopped up and diverted. Provision of new routes available to cyclists.	Permanent	Minor Beneficial	Slight Beneficial	Minor Beneficial	Slight Beneficial	Not significant
Other Routes Used by NMUs	Low	Stopping up of some local routes with proposals to maintain connectivity.	Permanent	Minor adverse	Slight adverse	Minor adverse	Slight adverse	Not significant
Public Highways	High (strategic routes) Low (local routes)	Diversion of some existing routes. Stopping up of Pound Hill. Provision of new section of motorway and link roads.	Permanent	Minor adverse	Slight adverse	Minor adverse	Slight adverse	Not significant
Users of Overbridge and Underbridge crossings	High (strategic routes) Low (local routes)	Retention of most links with the exception of Pound Hill.	Permanent	Minor adverse	Slight adverse	Minor adverse	Slight adverse	Not significant
Public Transport and Bus Stops	N/A	No impacts.	Permanent	No impact	N/A	N/A	N/A	N/A
Complementary Measures	N/A	No additional land take required.	Permanent	No impact	N/A	N/A	N/A	N/A

Activity/ Receptor	Sensitivity of receptor	Description of impact	Short / medium / long term	Magnitude of impact (without mitigation)	Significance of effect (without mitigation)	Magnitude of impact (with mitigation)	Significance of effect (with mitigation)	Significant / Not significant
Construction								
Public Rights of Way	High (Wales Coast Path) Low (Local routes)	Temporary stopping up of part of the route for Wales Coast Path and Newport Coast Path, and other local routes.	Medium term	Major adverse (Wales Coast Path/ Newport Coast Path) Moderate adverse (Local routes)	Large adverse (Wales Coast Path) Slight adverse (Local routes)	Negligible	Neutral	Not significant
Cycle Routes	High (NR4)	Temporary stopping up of section of route resulting in effects on route integrity.	Medium term	Moderate adverse	Moderate adverse	Minor adverse	Slight adverse	Not significant
Other Routes Used by NMUs	Low	No temporary effects.	N/A	N/A	N/A	N/A	N/A	N/A
Public Highways	High (strategic routes) Low (local routes)	Temporary stopping up and diversion with some changes to journeys.	Medium term	Minor to Moderate adverse	Slight to Moderate adverse	Minor to Moderate adverse	Slight to Moderate adverse	Significant (temporary)
Overbridge and Underbridge Crossings	High (strategic routes) Low (local routes)	Temporary loss of vehicular and NMU access across existing structures with some changes to local journeys.	Medium term	Minor to Moderate adverse	Slight to Moderate adverse	Minor to Moderate adverse	Slight to Moderate adverse	Significant (temporary)
Public Transport and Bus Stops	Medium	Temporary impacts on bus and rail services.	Medium term	Minor adverse	Slight adverse	Minor adverse	Slight adverse	Not significant
Community Severance	N/A	Impacts on journey length.	Medium term	N/A	Moderate	N/A	Slight to Moderate	N/A
Complementary Measures	N/A	No impacts.	N/A	N/A	N/A	N/A	N/A	N/A

Activity/ Receptor	Sensitivity of receptor	Description of impact	Short / medium / long term	Magnitude of impact (without mitigation)	Significance of effect (without mitigation)	Magnitude of impact (with mitigation)	Significance of effect (with mitigation)	Significant / Not significant
Operation								
Public Rights of Way	High (Wales Coast Path (WCP)) Low (Local Routes)	Maintaining connectivity of network and provision of new routes.	Permanent	No Change (WCP) Minor Beneficial (Local Routes)	Neutral (WCP) Slight Beneficial (Local Routes)	No Change (WCP) Minor Beneficial (Local Routes)	Neutral (WCP) Slight Beneficial (Local Routes)	Not significant
Cycle Routes	High (National Cycle Route 4) Medium (Cardiff to Newport Cycleway) Low (Local Routes)	Permanent diversion of NR4 and Cardiff to Newport Cycleway, together with provision of new routes available to cyclists.	Permanent	Minor beneficial	Slight beneficial	Minor beneficial	Slight beneficial	Not significant
Other Routes Used by NMUs	Low	Maintaining connectivity of these routes.	Permanent	Negligible	Neutral	Negligible	Neutral	Not significant
Public Highways	High (strategic routes) Low (local routes)	Creation of new section of motorway and new highways linking to it and maintaining connectivity of local highway network.	Permanent	Moderate Beneficial	Moderate Beneficial	Moderate Beneficial	Moderate Beneficial	Significant
Overbridge and Underbridge Crossings	Low	Maintaining connectivity for all travellers predominantly from the local road network.	Permanent	Negligible	Neutral	Negligible	Neutral	Not significant
Public Transport and Bus Stops	Medium	No Impacts	Permanent	N/A	N/A	N/A	N/A	N/A
Community Severance	N/A	Effects on pedestrian journeys.	Permanent	N/A	Slight Severe (re. Pound Hill)	N/A	Slight Severe (re. Pound Hill)	N/A

Activity/ Receptor	Sensitivity of receptor	Description of impact	Short / medium / long term	Magnitude of impact (without mitigation)	Significance of effect (without mitigation)	Magnitude of impact (with mitigation)	Significance of effect (with mitigation)	Significant / Not significant
Complementary Measures	Medium	Benefits to journeys along and from the local strategic network.	Permanent	Minor beneficial	Slight beneficial	Minor beneficial	Slight beneficial	Not significant