

A358 Taunton to Southfields Dualling Scheme

Preliminary Environmental Information Report - Chapter 12
Population and Health

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12 Population and health

12.1 Introduction

- 12.1.1 This chapter provides an assessment of the construction and operational effects of the A358 Taunton to Southfields Dualling Scheme (the 'proposed scheme') on population and human health. This chapter follows the methodology set out in the *Design Manual for Roads and Bridges* (DMRB) LA 112 *Population and human health* [1] and DMRB LA 104 *Environmental assessment and monitoring* [2]. These are followed as the extant methodology which has been developed to guide assessment of projects on the Strategic Road Network (SRN) in England, Scotland, Northern Ireland and Wales.
- 12.1.2 This chapter considers the relevant regulatory and policy framework related to population and human health, defines the study area for the purposes of assessment, details the methodology followed for the assessment, describes the existing environment in the area surrounding the proposed scheme (the baseline) and presents the assessment of effects on identified receptors during both construction and operation of the proposed scheme. Following this, the design, mitigation, and residual effects are discussed, along with the limitations of the assessment, where necessary.
- 12.1.3 In line with DMRB LA 112 *Population and human health*, this chapter is structured under the following impact areas (receptor groups):
- Land-use and accessibility, including:
 - private property and housing
 - community land and assets
 - development land and businesses
 - agricultural land holdings
 - walkers, cyclists, and horse riders, including disabled users (WCH).
 - Human health, including:
 - health profiles of affected communities
 - health determinants (factors which affect health outcomes, e.g., noise or air pollution)
 - likely health outcomes

12.2 Legislative and policy framework

- 12.2.1 This section assesses the legislation and policy framework relevant to the proposed scheme. As documented in Chapter 1 Introduction, the *National Policy Statement for National Networks* (NPSNN) [3] is the primary planning policy for the proposed scheme and forms the principal basis for making decisions on Development Consent Order (DCO) applications in England. The *National Planning Policy Framework* (NPPF) [4] is noted as being 'important and relevant' and is to be considered, however, if there is a conflict between the NPSNN and NPPF, the NPSNN takes precedence.
- 12.2.2 Table 12-1 identifies the NPSNN policies relevant to population and human health and then specifies where in the PEI Report information is provided to address the policy.

Table 12-1 Relevant NPSNN for applicant's population and human health assessment

Relevant NPSNN paragraph reference	Requirement of the NPSNN	Where in the PEI Report is information provided to address this policy
2.1	<i>Well-connected and high-performing networks with sufficient capacity are vital to meet the country's long-term needs and support a prosperous economy.</i>	The overarching objectives of the proposed scheme are to create a network which has sufficient capacity and provides for future demands. For further details, refer to Chapter 1 Introduction.
2.6	<i>There is also a need for development on the national networks to support national and local economic growth and regeneration, particularly in the most disadvantaged areas. Improved and new transport links can facilitate economic growth by bringing businesses closer to their workers, their markets and each other. This can help rebalance the economy.</i>	Nexus 25 development is a strategically important employment site located at junction 25 of the M5 at Taunton. Improvements to the A358 would increase connectivity between Taunton and Ilminster, benefitting the Nexus 25 development. Refer to section 12.9 Assessment of likely significant effects.
2.12 to 2.27	<i>Considers the need for development of the national road network. Of relevance to this Chapter, the drivers include well-connected and high-performing networks with sufficient capacity to meet the country's long-term needs and support a prosperous economy. This includes both stimulating and supporting economic growth as well as meeting broader environmental, safety and accessibility goals.</i>	The effects of the proposed scheme on overall connectivity and economic growth are considered broadly with reference to development land and businesses in sections 12.7 Potential impacts and 12.9 Assessment of likely significant effects.
3.3	<i>In delivering new schemes, the Government expects applicants to avoid and mitigate environmental and social impacts in line with the principles set out in the NPPF and the Government's planning guidance. Applicants should also provide evidence that they have considered reasonable opportunities to deliver environmental and social benefits as part of schemes.</i>	Mitigation measures are considered and detailed as part of the assessment at sections 12.8 Design, mitigation, and enhancement measures. Opportunities for wider benefits have also been considered, particularly in relation to the walking, cycling and horse riding (WCH) and Public Rights of Way (PRoW) network.
3.17	<i>There is a direct role for the national road network to play in helping pedestrians and cyclists. The Government expects applicants to use reasonable endeavours to address the needs of cyclists and pedestrians in the design of new schemes. The Government also expects applicants to identify opportunities to invest in infrastructure in locations where the national road network severs communities and acts as a barrier to cycling and walking, by correcting historic problems, retrofitting the latest solutions, and ensuring that it is easy and safe for cyclists to use junctions.</i>	The needs of WCH are considered in detail in section 12.9 Assessment of likely significant effects.
3.22	<i>Where appropriate applicants should seek to deliver improvements that reduce community severance and improve accessibility.</i>	Where appropriate, the design has responded to potential severance effects and proposed infrastructure which seeks to reduce severance and

Relevant NPSNN paragraph reference	Requirement of the NPSNN	Where in the PEI Report is information provided to address this policy
		ensure continued accessibility. This is particularly considered in relation to agricultural land holdings and WCH at section 12.8 Design, mitigation, and enhancement measures.
5.162	<i>Access to high quality open spaces and the countryside and opportunities for sport and recreation can be a means of providing necessary mitigation and/or compensation requirements. Green infrastructure can also enable developments to provide positive environmental and economic benefit.</i>	The potential effects on community land and assets (including recreation space, common land, and open access land) are presented in section 12.9 Assessment of likely effects.
5.165 to 5.172	<i>Outline expectations in relation to land use including open space, green infrastructure. Of relevance to this assessment, it requires the application to:</i> <ul style="list-style-type: none"> - Identify existing and proposed land uses near the project and consider effects of replacing an existing development or use of the site with the proposed project or preventing a development or use on a neighbouring site from continuing. - Existing open space, sports and recreational buildings and land should not be developed unless the land is surplus to requirements or the loss would be replaced by equivalent or better provision in terms of quantity and quality in a suitable location. 	The potential effects on community land and assets (including recreation space, common land, and open access land) are presented in section 12.9 Assessment of likely effects.
5.184	<i>Public rights of way, National Trails, and other rights of access to land (e.g., open access land) are important recreational facilities for walkers, cyclists, and equestrians. Applicants are expected to take appropriate mitigation measures to address adverse effects on coastal access, National Trails, other public rights of way and open access land and, where appropriate, to consider what opportunities there may be to improve access.</i>	The proposed approach to PRoW and open access land is detailed within sections 12.9 Assessment of likely significant effects.

12.2.3 This section presents wider legislation and policy of most relevance to the assessment and includes a summary of how the assessment has responded to the relevant policy requirements.

12.2.4 This section does not provide a review of the legislation and policy support for the proposed scheme itself. This would be provided within a separate planning statement (case for the proposed scheme) that would accompany the DCO application.

12.2.5 A list of relevant national, regional, and local policies is set out below.

Legislation

12.2.6 The national legislation of relevance includes:

- *Countryside and Rights of Way Act 2000* [5]: The Act provides a new right of public access on foot to areas of open land. The Act also provides safeguards which consider the needs of landowners and occupiers, and of other interests, including wildlife. The Act improves the rights of way legislation by encouraging the creation of new routes and clarifying uncertainties about existing rights.

National planning policy and guidance

12.2.7 The national policies of relevance include:

- *National Planning Policy Framework (NPPF)* (July 2021): The NPPF seeks a transport system which gives choice to people on how they travel, while recognising that opportunities to maximise sustainable transport solutions would vary from urban to rural areas. The policy on transport retains the priority on reducing the need to travel and policies in favour of sustainable transport modes.
- *National Infrastructure Strategy (November 2020)* [6]: *The National Infrastructure Strategy sets out plans to transform UK infrastructure in order to level up the country, strengthen the Union and achieve net zero emissions by 2050.*
- *National Planning Practice Guidance (PPG)* [7]: *Open Space, Sports and recreation facilities, public rights of way and local green space*: The guidance states that existing open space should be taken into account when considering development proposals.
- *Government White Paper: Healthy Lives, Healthy People* (2010) [8]: The white paper outlines the Government's commitment to helping people live longer, healthier and more fulfilling lives, while improving the health of the poorest, fastest.
- Department for Transport (DfT) *Gear Change: A bold vision of cycling and walking* [9]: Following the recent COVID-19 restrictions, the government has launched a new strategy to transform the role cycling and walking can play in our transport system, and get England moving differently. The vision seeks to create a travel revolution in our communities, which would make cycling and walking a natural first choice for many journeys.

National strategies

12.2.8 The national strategies of relevance include:

- *Second Road Investment Strategy: 2020-2025* (2020) [10] (RIS2): The RIS2 includes the A358 as a committed project for Road Period (RP) 2, which runs between financial years 2020/21 to 2024/25.
- *Highways England Cycling Strategy* [11]: The Strategy sets out how the planned roads improvements programme would provide integrated schemes which improve cycling facilities, contributing towards the development of an integrated, safe, comprehensive and high-quality cycling network.
- *Highways England Accessibility Strategy* [12]: The vision for accessibility focuses on supporting road users' journeys, including pedestrians, cyclists, equestrians, those with disabilities and other vulnerable users, while delivering

longer-term benefits for communities and users alike. It aims to address the barriers that roads can sometimes create, help expand people's travel choices, enhance and improve network facilities, and make everyday journeys as easy as possible.

Regional planning policy

12.2.9 The regional planning policies of relevance include:

- *Somerset County Council's Active Travel Strategy (2012) [13]*: Sets out the county's strategy to facilitate active travel choices by making these options easier to access and more attractive. It highlights the potential for improving health and wellbeing, air quality, and access to services without increasing congestion; and enhancing mobility options for vulnerable groups such as older people and those who are socially excluded.

Local planning policy

12.2.10 The local planning policies of relevance include:

- *Taunton Deane Core Strategy 2011-2028 [14]*: Taunton Deane Core Strategy was adopted by the former Taunton Deane Borough Council in 2012. The relevant policies include:
 - Policy CP2: Economy
Policies to enable the Borough to reach its full economic potential to provide sufficient, deliverable land in the right place and at the right time to enable sustainable growth.
 - Policy CP3: Town and other Centres
Policies to promote the vitality and viability of town and other centres as important places for communities and as a major focus for employment and drivers of economic growth.
 - Policy CP6: Transport and Accessibility
Policies seeking that development should contribute to reducing the need to travel, improve accessibility to jobs, services and community facilities, and mitigate and adapt to climate change.
 - Policy CP7: Infrastructure
Policies that identify the infrastructure that local service providers and the Borough and County Councils have established as key to delivering future growth.
- In 2019, the local authorities of Taunton Deane and West Somerset merged together to become Somerset West and Taunton Council (SWTC). Once adopted, their joint Local Plan 2040 would replace the existing Local Plan documents of the former Taunton Deane Borough Council and West Somerset Council. The Council is currently at Stage 1, Regulation 18 of preparing the Local Plan, Regulation 18 of preparing the Local Plan, which marks the start of the engagement stage inviting organisations to make representations about what the policies update ought to contain.
- *South Somerset Local Plan 2006-2028, March 2015 [15]*: South Somerset Local Plan was adopted by South Somerset District Council (SDDC) in March 2015. The relevant policies include:
 - Policy SS3: Delivery New Employment Land

Policies to assist the delivery of 11,250 jobs as a minimum, and 149.51 hectares of land for economic development between April 2006 and March 2028.

- Policy PMT3: Ilminster Direction of Growth
In order to accommodate the proposed level of residential development in Ilminster, a 'Direction of Growth' has been identified to the south-west of the town; and
- Policy EP1: Strategic Employment Sites
Identifies employment allocations that are strategically significant for local and inward investment.

12.3 Assessment methodology

12.3.1 The assessment methodology for population and health and is separated out to cover the two elements of the topic.

Assessment methodology for land use and accessibility elements

12.3.2 The significance of an environmental effect is a function of the 'value' of the receptor and the 'magnitude' or 'scale' of the impact, which are considered further below. The methodology set out below is taken from DMRB LA 112 *Population and human health*. The assessment has been undertaken within this framework with professional judgement also applied, as needed. Where professional judgement has been used, this is clearly explained within the assessment.

12.3.3 Certain elements of the assessment methodology have been developed in accordance with DMRB, where this provides an appropriate approach:

- DMRB LA 101 *Introduction to environmental assessment* [16];
- DMRB LA 102 *Screening projects for Environmental Impact Assessment* [17];
- DMRB LA 103 *Scoping projects for environmental assessment* [18]; and
- DMRB LA 104 *Environmental assessment and monitoring* [2].

12.3.4 As is cross referenced in DMRB LA 112 *Population and human health*, consultation with authorities likely to be affected by the proposed scheme has been undertaken in accordance with DMRB LA 104 *Environmental assessment and monitoring*.

Baseline data gathering

12.3.5 The land use and accessibility baseline has been developed by:

- data collection (commencing at the screening/scoping stage and developed with greater detail where further assessment is required)
- spatial data mapping
- Farm Impact Assessment meetings
- consultation (where required to inform assessment conclusions). This is ongoing and would be reported in the Environmental Statement (ES) which supports the DCO application

12.3.6 Utilising these methods, the following data has been gathered for each of the broad receptor groups:

- Private property and housing:
 - The location and number of properties at risk of demolition, or from which land would be required or access affected by the proposed scheme.

- The location of residential development land and number of units that would be affected by the proposed scheme.
- Community land and assets:
 - The location of community land (e.g. common land, village greens, open green space, allotments, sports pitches) and amount of land which would be required/access affected by the proposed scheme.
 - The location of community assets (e.g. village halls, healthcare facilities, education facilities, religious facilities) and number of assets from which land would be required or access affected by the proposed scheme.
 - The level of existing accessibility restrictions or severance to community land and assets within the study area.
 - The frequency of use of community land and assets within the study area.
- Development land and businesses:
 - The location and number of businesses (and associated jobs) at risk or from which land would be required or access affected by the proposed scheme.
 - The location of land allocated for development by local authorities and the number of future jobs that would be affected by the proposed scheme.
 - Land not allocated by local authorities which is subject to planning application(s) supporting future jobs.
 - The level of existing accessibility restrictions or severance to development land and businesses within the study area.
- Agricultural land holdings:
 - Baseline farming circumstances including the size, location and use of the holding, the scale and nature of agricultural and non-agricultural enterprises, details of agri-environment schemes, details of farm infrastructure (e.g. buildings, drainage and tracks).
 - The physical and operational impacts on the structure and operation of agricultural land holdings arising from the proposed scheme.
 - The level of existing severance or accessibility restrictions to agricultural land holdings within the study area.
 - The frequency of use of the agricultural holdings/assets within the study area.
 - Options for mitigating likely significant environmental effects identified on an individual farm holding.
- WCH:
 - The type, location and extent of WCH provision (e.g. PRoW) within the study area.
 - The frequency of use of the WCH provision within the study area.

12.3.7 Where stakeholder consultation has not been possible, publicly available data has been gathered in order to provide information in relation to the frequency and type of use for community land and assets and agricultural land holdings.

12.3.8 Surveys are undertaken as part of the WCH Assessment and Review reports which provide useful usage data for the WCH network in the area surrounding the proposed scheme. Surveys will be completed and reported on in the ES to support of the DCO application.

12.3.9 In line with DMRB LA 112 *Population and human health*, it is considered that data collection and surveys undertaken to inform this assessment are proportionate and appropriate given the proposed scheme, local environment and potential effects.

12.3.10 Baseline conditions are identified and reported in Section 12.6.

Receptor value (sensitivity)

12.3.11 Where possible, environmental value/sensitivity has been applied as set out in Table 3.11 of DMRB LA 112 *Population and human health* and replicated in Table 12-2.

12.3.12 This provides a range of definitions/criteria to inform the environmental value (sensitivity) of key receptors. Whilst this provides a consistent framework for assessment, professional judgement is used where appropriate in order to provide further clarity on value descriptions.

12.3.13 In cases where the standard value description cannot be directly applied to a scheme specific receptor, the chapter describes the nature of the professional judgement applied within the framework of the standard.

Table 12-2 Receptor sensitivity for land use and accessibility

Receptor sensitivity	Criteria
Very high	<p>Private property and housing:</p> <ul style="list-style-type: none"> • Existing private property or land allocated for housing located in a local authority area where the number of households are expected to increase by >25% by 2041 (ONS data). • Existing housing and land allocated for housing (e.g. strategic housing sites) covering >5ha (hectares) and/or >150 houses. <p>Community land and assets where there is a combination of the following:</p> <ul style="list-style-type: none"> • Complete severance between communities and their land/assets, with little/no accessibility provision. • Alternatives are only available outside the local planning authority area. • The level of use is very frequent (daily). • The land and assets are used by the majority (≥50%) of the community. <p>Development land and businesses:</p> <ul style="list-style-type: none"> • Existing employment sites (excluding agriculture) and land allocated for employment (e.g. strategic employment sites) covering >5ha. <p>Agricultural land holdings:</p> <ul style="list-style-type: none"> • Areas of land in which the enterprise is wholly reliant on the spatial relationship of land to key agricultural infrastructure. • Access between land and key agricultural infrastructure is required on a frequent basis (daily). <p>WCH:</p> <ul style="list-style-type: none"> • National trails and routes likely to be used for both commuting and recreation that record frequent (daily) use. Such routes connect communities with employment land uses and other services with a direct and convenient WCH route. Little/no potential for substitution. • Routes regularly used by vulnerable travellers such as the elderly, school children and people with disabilities, who could be disproportionately affected by small changes in the baseline due to potentially different needs. • Rights of way for WCH crossing roads at grade with >16,000 vehicles per day.

Receptor sensitivity	Criteria
High	<p>Private property and housing:</p> <ul style="list-style-type: none"> • Private property or land allocated for housing located in a local planning authority area where the number of households are expected to increase by 16-25% by 2041 (ONS data). • Existing housing and land allocated for housing (e.g. strategic housing sites) covering >1-5ha and/or >30-150 houses. <p>Community land and assets where there is a combination of the following:</p> <ul style="list-style-type: none"> • There is substantial severance between community and assets, with limited accessibility provision. • Alternative facilities are only available in the wider local planning authority area. • The level of use is frequent (weekly). • The land and assets are used by the majority ($\geq 50\%$) of the community. <p>Development land and businesses:</p> <ul style="list-style-type: none"> • Existing employment sites (excluding agriculture) and land allocated for employment (e.g. strategic employment sites) covering >1-5ha. <p>Agricultural land holdings:</p> <ul style="list-style-type: none"> • Areas of land in which the enterprise is dependent on the spatial relationship of land to key agricultural infrastructure. • Access between land and key agricultural infrastructure is required on a frequent basis (weekly). <p>WCH:</p> <ul style="list-style-type: none"> • Regional trails and routes (e.g. promoted circular walks) likely to be used for recreation and to a lesser extent commuting, that record frequent (daily) use. Limited potential for substitution. • Rights of way for WCH crossing roads at grade with >8,000-16,000 vehicles per day.
Medium	<p>Private property and housing:</p> <ul style="list-style-type: none"> • Houses or land allocated for housing located in a local authority area where the number of households are expected to increase by >6-15% by 2041 (Office of National Statistics (ONS) data [19]). • Existing housing and land allocated for housing (e.g. strategic housing sites) covering $\approx 50\%$ of the community. <p>Community land and assets where there is a combination of the following:</p> <ul style="list-style-type: none"> • There is severance between communities and their land/assets but with existing accessibility provision. • Limited alternative facilities are available at a local level within adjacent communities. • The level of use is reasonably frequent (monthly). • The land and assets are used by the majority ($\geq 50\%$) of the community. <p>Development land and businesses:</p> <ul style="list-style-type: none"> • existing employment sites (excluding agriculture) and land allocated for employment (e.g. strategic employment sites) covering 4,000-8,000 vehicles per day. <p>Agricultural land holdings:</p> <ul style="list-style-type: none"> • Areas of land in which the enterprise is partially dependent on the spatial relationship of land to key agricultural infrastructure. • Access between land and key agricultural infrastructure is required on a reasonably frequent basis (monthly). <p>WCH:</p>

Receptor sensitivity	Criteria
	<ul style="list-style-type: none"> • PRow and other routes close to communities which are used for recreational purposes (e.g. dog walking), but for which alternative routes can be taken. These routes are likely to link to a wider network of routes to provide options for longer, recreational journeys. • Rights of way for WCH crossing roads at grade with >4,000-8,000 vehicles per day.
Low	<p>Private property and housing:</p> <ul style="list-style-type: none"> • Proposed development on unallocated sites providing housing with planning permission/in the planning process. <p>Community land and assets where there is a combination of the following:</p> <ul style="list-style-type: none"> • Limited existing severance between community and assets, with existing full <i>Disability Discrimination Act 1995 (DDA)</i> [20] compliant accessibility provision. • Alternative facilities are available at a local level within the wider community. • The level of use is infrequent (monthly or less frequent). • The land and assets are used by the minority ($\leq 50\%$) of the community. <p>Development land and businesses:</p> <ul style="list-style-type: none"> • Proposed development on unallocated sites providing employment with planning permission/in the planning process. <p>Agricultural land holdings:</p> <ul style="list-style-type: none"> • Areas of land which the enterprise is not dependent on the spatial relationship of land to key agricultural infrastructure. • Access between land and key agricultural infrastructure is required on an infrequent basis (monthly or less frequent). <p>WCH:</p> <ul style="list-style-type: none"> • Routes which have fallen into disuse through past severance or which are scarcely used because they do not currently offer a meaningful route for either utility or recreational purposes. • Rights of way for WCH crossing roads at grade with <4,000 vehicles per day.
Negligible	<p>Private property and housing:</p> <ul style="list-style-type: none"> • N/A. <p>Community land and assets where there is a combination of the following:</p> <ul style="list-style-type: none"> • no or limited severance or accessibility issues; • alternative facilities are available within the same community; • the level of use is very infrequent (a few occasions yearly); and • the land and assets are used by the minority ($\leq 50\%$) of the community. <p>Development land and businesses:</p> <ul style="list-style-type: none"> • N/A. <p>Agricultural land holdings:</p> <ul style="list-style-type: none"> • areas of land which are infrequently used on a non-commercial basis. <p>WCH:</p> <ul style="list-style-type: none"> • N/A.

12.3.14 For the purposes of this assessment, tourism and recreation receptors have been considered either as part of the community assets or development land and businesses assessment, depending on the nature of the receptor identified. Where this is the case, it has been explained.

12.3.15 When considering development land and businesses, 'employment sites' are taken to include any receptors that employ people.

Magnitude of impact

12.3.16 Magnitude criteria have been applied as set out in Table 3.12 of DMRB LA 112 *Population and human health* and as listed in Table 12-3 to Table 12-4.

Table 12-3 Magnitude of impact for land use and accessibility

Magnitude of impact	Typical description
Major	Private property and housing, community land and assets, development land and businesses and agricultural land holdings: <ul style="list-style-type: none"> • Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements e.g. direct acquisition and demolition of buildings and direct development of land to accommodate highway assets. • Introduction (adverse) or removal (beneficial) of complete severance with no/full accessibility provision. WCH: <ul style="list-style-type: none"> • >500m increase (adverse)/decrease (beneficial) in WCH journey length.
Moderate	Private property and housing, community land and assets, development land and businesses and agricultural land holdings: <ul style="list-style-type: none"> • Partial loss of/damage to key characteristics, features or elements, e.g. partial removal or substantial amendment to access or acquisition of land compromising viability of property, businesses, community assets or agricultural holdings. • Introduction (adverse) or removal (beneficial) of severe severance with limited/moderate accessibility provision. WCH: <ul style="list-style-type: none"> • >250-500m increase (adverse) or decrease (beneficial) in WCH journey length.
Minor	Private property and housing, community land and assets, development land and businesses and agricultural land holdings: <ul style="list-style-type: none"> • A discernible change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements e.g. amendment to access or acquisition of land resulting in changes to operating conditions that do not compromise overall viability of property, businesses, community assets or agricultural holdings. • Introduction (adverse) or removal (beneficial) of severance with adequate accessibility provision. WCH: <ul style="list-style-type: none"> • >50-250m increase (adverse) or decrease (beneficial) in WCH journey length.
Negligible	Private property and housing, community land and assets, development land and businesses and agricultural land holdings: <ul style="list-style-type: none"> • Very minor loss or detrimental alteration to one or more characteristics, features or elements e.g. acquisition of non-operational land or buildings not directly affecting the viability of property, businesses, community assets or agricultural holdings. • Very minor introduction (adverse) or removal (beneficial) of severance with ample accessibility provision. WCH: <ul style="list-style-type: none"> • <50m increase (adverse) or decrease (beneficial) in WCH journey length.
No change	No loss or alteration of characteristics, features, elements or accessibility; no observable impact in either direction.

12.3.17 In addition to the above descriptions, professional judgement has also been applied when appropriate throughout the assessment. For example, a change

could lead to a <500m increase in WCH journey length but drastically improve the safety and environmental quality of that route when compared to the baseline position. Professional judgement has been used to weigh the overall impacts of the environmental benefits against the increases to journey length. Given the importance of other factors such as these in assessing the magnitude of change, these are described and applied within the assessment in section 12.19 Assessment of likely significant effects.

- 12.3.18 For the purposes of this assessment, only those receptors situated within the DCO boundary are expected to experience direct effects. This approach helps to ensure that potential direct construction effects (e.g. where receptors interact with construction access routes and construction compounds) and potential direct operational effects (e.g. where a receptor interacts with the proposed scheme alignment) are considered.
- 12.3.19 For receptors situated outside of the DCO boundary, much of the assessment explores potential indirect and amenity effects, including impacts on access and the ongoing use of a receptor.
- 12.3.20 In considering significance, the assessment also makes a distinction between temporary and permanent impacts, with temporary effects during construction considered to have a reduced effect to that of a permanent effect during operation. For example, any local management of a route during construction with low sensitivity, which would have a negligible magnitude, would likely result in a neutral effect rather than a slight adverse effect given its temporary nature.

Assessment of significance

- 12.3.21 The significance of effect is derived by combining the assigned value (sensitivity) of receptors with the magnitude of change arising from a project, in accordance with DMRB LA 104 *Environmental assessment and monitoring*. The significance of effect shall be determined for each element of the land and accessibility subtopic (e.g. private property and housing, development land and businesses) affected by a project. It is noted that significant effects typically comprise effects after consideration of mitigation.
- 12.3.22 For the purposes of this assessment, the significance of impacts has been applied as per Table 12-4.
- 12.3.23 Significant effects are those where significance is deemed to be 'moderate' or greater, overall.
- 12.3.24 Where there are dual allocations (e.g. 'large or very large'), the assessment considers evidence and applies professional judgement to select a single category. Where it is possible to further clarify an allocation, this is explained in the assessment.

Table 12-4 Significance of impacts for land use and accessibility

Environmental value	Magnitude of impact					
		No change	Negligible	Minor	Moderate	Major
Very high		Neutral	Slight	Moderate or large	Large or very large	Very large
High		Neutral	Slight	Slight or moderate	Moderate or large	Large or very large

	Medium	Neutral	Neutral or slight	Slight	Moderate	Moderate or large
	Low	Neutral	Neutral or slight	Neutral or slight	Slight	Slight or moderate
	Negligible	Neutral	Neutral	Neutral or slight	Neutral or slight	Slight

Design and mitigation

12.3.25 The following mitigation hierarchy has been implemented during design and assessment:

- Avoidance and prevention
 - Identify alternative design/route options that avoid the requirement to compulsory purchase property, land and assets.
 - Identify alternative design/route options that avoid introducing or worsening severance and avoid reducing WCH provision/increasing journey times.
- Reduction
 - Reduce impacts on property, land and assets by selecting route alignments that avoid land take from the most sensitive receptors/aspects of receptors thereby maintaining viability.
 - By altering alignment to reduce severance to communities and disruption to WCH provision.
- Remediation
 - Where it is not possible to avoid or reduce a significant adverse effect, e.g. community sports pitches have to be acquired to facilitate construction, provide equivalent facilities as close to the original location as possible.

12.3.26 Engagement with project designers and stakeholders early in the assessment and design process has been undertaken in an effort to increase the effectiveness of design and mitigation measures. Our approach and response to engagement and consultation would be provided in the separate Consultation Report that supports the DCO application.

12.3.27 WCH design, assessment and provision is being undertaken in accordance with DMRB GG 142 *Walking, cycling and horse-riding assessment and review* [21]. The WCH Review Report would be submitted as part of the ES in support of the DCO application.

Environmental enhancement

12.3.28 Where possible, enhancement opportunities have been identified and reported including enhancement opportunities for land use and accessibility, for example returning non-operational highway to community use following completion of construction.

Reporting

12.3.29 As part of the assessment, land use effects have been assessed during construction and for the first year of operation (future year scenario).

12.3.30 After the first year of operation, effects on land use are assumed to be associated with routine maintenance operations and are therefore unlikely to be significant.

Assessment methodology for human health elements

- 12.3.31 The assessment of human health is a multidisciplinary process designed to identify and assess the potential health outcomes (both positive and negative) of a proposed project, plan or programme and to deliver evidence-based recommendations that optimise health gains and reduce or remove potential negative impacts or inequalities.
- 12.3.32 This section sets out the methodology for the human health assessment that has been followed, including baseline data for the study population (including identification of vulnerable and disadvantaged groups), information and data sources that were consulted, assessment criteria and initial assessment outcomes.
- 12.3.33 There is currently no statutory guidance for assessing the wider effects of projects on human health, however DMRB LA 112 *Population and human health* has been followed.
- 12.3.34 The assessment approach has been qualitative except where informed by quantitative findings from the PEI Report topic chapters, comprising: air quality, noise, population, material assets and waste, and climate change.

Baseline data gathering

- 12.3.35 Baseline relevant to the population health assessment includes establishing health profiles for the study area (see section 12.6 Baseline Conditions) and consideration of determinants of health within the study area. Baseline health profiles for each of the wards have been collated from a range of sources to provide an overview of the following, as required by DMRB LA 112 *Population and human health*:
- percentage of the community with increased susceptibility to health issues (e.g. older people, 65 plus and young children)
 - percentage of the community with pre-existing health issues (e.g. respiratory disease and chronic obstructive pulmonary disease (COPD))
 - deaths from respiratory diseases
 - percentage of the community with long-term illness or disability
 - general health
 - life expectancy
 - income deprivation
- 12.3.36 Determinants of health are environmental and social factors which influence health outcomes. The following determinants are identified within DMRB LA 112 *Population and human health* as requiring consideration in the context of road schemes:
- recreational and education facilities and severance/separation of communities from such facilities
 - the location of green/open space and severance/separation of communities from such facilities
 - the location of healthcare facilities and severance/separation of communities from such facilities
 - transport and accessibility, including the surrounding road network, ProW (including bridleways), cycle ways, non-designated public routes and public transport routes

- air quality management areas and ambient air quality
- areas recognised as being sensitive to noise (e.g. noise important areas, noise management areas) and the ambient noise environment
- sources and pathways of potential pollution (e.g. land/water contamination)
- landscape amenity
- safety information associated with the existing Affected Road Network (ARN) (e.g. numbers of killed and seriously injured).

12.3.37 Information relating to the existing population baseline is included within the health baseline data gathering exercise. Health determinant baseline data predominantly features within the land use and accessibility baseline (see section 12.6 Baseline conditions).

Sensitivity of the study population

12.3.38 The sensitivity of the study population/s to changes in health determinants depends on the level of exposure and the vulnerability of the population to those changes.

12.3.39 The level of population exposure is defined by the size of the population exposed to an impact which is judged on a scale of high, medium and low, dependent on geographical area and number of people exposed. The vulnerability of the population is also judged on a scale of high, medium and low. Decisions on vulnerability are based on the baseline data collated for the study area. More vulnerable populations include those with higher levels of social deprivation or relatively poor health status (Table 12-5).

Table 12-5 Guidelines for the assessment of population exposure and vulnerability

Rating	Guidelines	
	Population exposure	Population vulnerability
High	A high level of exposure would occur over a wide geographical area and/or be likely to affect a large number of people (e.g. >500).	Affected population includes a higher than national average proportion of vulnerable or disadvantaged groups (such as children or older people) who are more likely to experience adverse health effects as a result of the impact in question.
Medium	A medium level of exposure would occur over a relatively localised area and/or be likely to affect a moderate-large number of people (e.g. 100-500).	Affected population includes an average or close to average proportion of vulnerable or disadvantaged groups who are more likely to experience adverse health effects as a result of the impact in question.
Low	A low level of exposure would occur over a small, local area and/or affect a small number of people (e.g. <100).	Affected population includes a below average proportion of vulnerable or disadvantaged groups who are more likely to experience adverse health effects as a result of the impact in question.

12.3.40 Population exposure and population vulnerability are combined to give an overall judgement on population sensitivity, on a scale of high, medium or low as show in Table 12-6.

Table 12-6 Population sensitivity matrix

Population exposure	Population vulnerability		
	High	Medium	Low
High	High	High	Medium
Medium	High	Medium	Low
Low	Medium	Low	Low
Negligible	Low	Low	Low

Literature review – linking health outcomes to health impacts

12.3.41 Using available literature, including previous health studies and recent research, an evidence base has been collated to identify links between the selected determinants and health impacts. Key reference material has included:

- government health policies, programmes and strategies
- previous health assessments for masterplans
- public health reports and research papers from a range of sources, including:
 - Public Health England
 - World Health Organisation (WHO)
 - National Institute for Health and Care Excellence (NICE)
 - Health Development Agency (HDA)

12.3.42 The literature review for each of the health determinants is included in Appendix 12.1 Health determinants evidence review which includes full details of reference material used.

Assessing human health effects

12.3.43 Changes to health determinants, as a result of the proposed scheme, in combination with the sensitivity of the population/community to these changes, may result in changes in health outcomes. DMRB LA 112 *Population and human health* does not provide guidance for the assignment of magnitude of change or significance, rather it sets out a requirement to provide a statement on whether the predicted health outcomes from changes in health determinants are likely to be positive, neutral, negative, or uncertain. These health outcomes are recorded as described in Table 12-7.

Table 12-7 Human health outcome categories

Human health category	Health outcome description
Positive	A beneficial health impact is identified
Neutral	No discerning health impact is identified
Negative	An adverse health impact is identified
Uncertain	Where uncertainty exists as to the overall health impact

12.4 Assessment assumptions and limitations

12.4.1 This section sets out the assessment assumptions and limitations that has informed this Population and Health chapter. The assessment relies, in part, on data and information provided by third-parties (e.g. local councils and landowners), which are the most up to date records, available at the time of the assessment.

- 12.4.2 The assessment identifies and considers impacts at the stage they first materialise. For example, the permanent removal of built form or vegetation is assessed as part of the construction phase where works would be required to enable construction.
- 12.4.3 The assessment of impacts on the identified facilities/receptors has been carried out through the completion of a desk-based assessment and site verification exercise, taking into account the promoted use and function of the identified facilities/receptors in the study area (e.g. tourism and recreation assets).
- 12.4.4 Given that the majority of potential impacts are likely to be indirect (with receptors outside of the proposed scheme's DCO boundary), the assessment often focuses on indirect and amenity effects on the operation and accessibility of existing facilities during both construction and operation of the proposed scheme.
- 12.4.5 A review of development land and businesses has been informed by a desktop exercise to help identify receptors. The list may not be exhaustive.
- 12.4.6 Baseline agricultural holding data collection is currently ongoing, with every reasonable effort being made to discuss the potential effects of the proposed scheme on the agricultural land holdings affected. However, not all landowners or their agents have chosen to engage with this process.
- 12.4.7 Information on community facilities has been primarily obtained from desk-based research alongside site-based review.
- 12.4.8 Land ownership information has been collected using land registry data and is updated by the project team on an ongoing basis based on information gathered from site visits, landowner discussions and other information data gathering exercises. This PEI Report has utilised the information available at the time of this assessment.
- 12.4.9 Effects on property prices have not been considered as part of the assessment, given that they are not planning matters within the scope of considerations for the DCO application.
- 12.4.10 Socio-economic baseline data has largely been based on outputs from the 2011 Census [22], which despite being approximately ten years old at the time of this assessment, provides the most full and reliable dataset. Where more recent data is available, the appropriate references are provided.
- 12.4.11 The information contained within the PEI Report and other project documents has been used to characterise the study area and identify impacts on human health determinants.
- 12.4.12 The approach to the assessment of health impacts is generally qualitative, identifying likely positive and negative impacts based on the relationships between determinants and health outcomes identified within the literature reviewed.
- 12.4.13 Any reference to traffic flows and travel conditions relies on the outputs of the traffic model produced for the proposed scheme that are being updated and would be published within a Combined Modelling and Appraisal (ComMA) report to support the DCO application.
- 12.4.14 Literature and baseline data used in the study has been limited to readily available public and published sources.

12.4.15 The information contained within each of the chapters of the PEI Report and other project documents has been used to characterise the study area and identify impacts on health determinants.

12.5 Study area

12.5.1 This section assesses the context of the study area. DMRB LA 112 *Population and human health* sets out that:

- The study area shall be based on the construction footprint or project boundary (including compounds and temporary land take) plus a 500m area surrounding the project boundary.
- Where likely effects are identified outside of the 500m area surrounding the project boundary, the study area should be extended accordingly.
- Where effects are unlikely to occur within the 500m area surrounding the project boundary, the study area should be reduced accordingly.

12.5.2 The study area for each impact area has therefore been defined through consideration of the potential effects on key receptor groups as described above and the area over which an effect is likely to be experienced. This has been informed through both consideration of direct effects which would largely be limited to the extent of the proposed scheme (DCO boundary), and indirect effects which could be experienced over a wider area.

12.5.3 For the land use and accessibility receptors, the 500m study area has been applied and is considered appropriate for both direct and indirect effects. Specifically, in relation to WCH and the PRow network, whilst the baseline and assessment considers all PRow and recreational routes within 500m of the proposed scheme, the assessment focusses primarily on the potential direct effects where works would impact on the PRow network. Consideration is also given to potential indirect effects for those using the network in the areas surrounding the proposed scheme. These effects would be typically temporary following the implementation of mitigation measures which would negate any operational residual effects.

12.5.4 A more focussed assessment has also been undertaken when considering community land as effects relate to land take and direct impacts on these receptors only. This has therefore focussed on areas within the DCO boundary where land is required either permanently or temporarily in order to deliver the proposed scheme.

12.5.5 Figure 12.1 Population and Health Study Area shows the 500m extent of the study area and also includes a 250m extent for context. It also shows the DCO boundary as the area within which direct effects from the proposed scheme would be predicted to occur. Receptors outside of this area would be considered in the context of indirect effects only (e.g. effects from construction traffic and noise).

12.5.6 Where any part of an agricultural holding falls with the DCO boundary, the entire agricultural holding is part of the study area for impacts on this receptor as any effects would relate to the farm business as a whole.

12.5.7 Consideration of health effects is applied at a population level and therefore is based on data that is available at an appropriate scale. In this case, the most appropriate data is generally available at ward level. Where a scheme passes through several administrative areas, baseline data covers the population that lives within the wards through which the proposed scheme passes. Where data is

not available at local ward level, data from a different geographical scale is used. For example, in some cases data is only available at local authority or county level.

- 12.5.8 In relation to the quantification of air quality and noise effects, reference has been made to the air and noise assessments that have been prepared for the proposed scheme, which have used a 200m and 600m study area, respectively. However, the health assessment has used these results, together with an appreciation of the health status within the study area to make an assessment of population health with regards to these determinants.
- 12.5.9 In summary, the study areas considered for each of the impact areas that are taken into account within this chapter are summarised in Table 12-8. The wards considered within the human health assessment are shown on Figure 12.1 Population and Health Study Area.

Table 12-8 Study areas

Impact area	Study area for direct effects	Study areas for indirect or amenity effects
Land use and accessibility		
Private property and housing	Receptors located within the DCO boundary.	Receptors located within 500m of the DCO boundary.
Community land and assets	Receptors (assets and/or community land) located within the DCO boundary.	Receptors located within 500m of the DCO boundary.
Development land and businesses	Receptors located within the DCO boundary.	Receptors located within 500m of the DCO boundary.
Agricultural land holdings	All land which forms part of the affected receptor.	All land which forms part of the affected receptor.
Walkers, cyclists and horse riders (WCH)	The existing A358 and existing and proposed routes passing within the DCO boundary, both during construction and operation.	Existing and proposed routes located within 500m of the DCO boundary.
Human health		
Wards through which the proposed scheme passes (a ward is a local authority area, typically used for electoral purposes. The codes presented in the table are the national reference numbers)	<ul style="list-style-type: none"> • West Monkton – E36005293. • Taunton Halcon – E36005284. • Taunton Blackbrook and Holway – E36005281. • Ruishton and Creech – E36005279. • North Curry and Stoke St Gregory – E36005277. • Neroche, Taunton Deane – E36005276. • Neroche, South Somerset – E36005253. • Islemoor – E36005248. • Ilminster – E36005247. 	<ul style="list-style-type: none"> • West Monkton – E36005293. • Taunton Halcon – E36005284. • Taunton Blackbrook and Holway – E36005281. • Ruishton and Creech – E36005279. • North Curry and Stoke St Gregory – E36005277. • Neroche, Taunton Deane – E36005276. • Neroche, South Somerset – E36005253. • Islemoor – E36005248. • Ilminster – E36005247.

12.6 Baseline conditions

Current baseline

12.6.1 This section assesses the baseline conditions for the proposed scheme at the time of this PEI Report, reporting on the following elements:

- Land use and accessibility, including:
 - private property and housing
 - community land and assets
 - development land and businesses
 - agricultural land holdings
 - WCH (including all groups of non-motorised travellers)
- Human health, including:
 - health profiles of affected communities
 - health determinant status (e.g. noise or air pollution)

Land use and accessibility

Private property and housing

12.6.2 In determining the sensitivity of private property and housing, DMRB LA 112 *Population and human health* utilises household projections as a key dataset, as well as considering existing housing/land allocated for housing.

12.6.3 The 2018-based household projects to 2041 for the local authority areas of Taunton Deane and South Somerset. In 2019, Taunton Deane local authority merged to become SWTC; however, the latest data for ONS household projections is from 2018 [19] (as presented in Table 12-9).

Table 12-9 ONS Household Projections 2018-based to 2041

Geography	2018	2041	Total Change	% Change
Taunton Deane	51,083	55,727	4,644	9.1
South Somerset	73,191	83,279	10,088	13.8
Total	124,274	139,006	14,732	11.9

12.6.4 This data shows a total percentage change in household growth in the region of 11.9%, which when considered against DMRB LA 112 *Population and human health* would get a medium sensitivity for private property and housing.

12.6.5 However, DMRB LA 112 *Population and human health* also includes consideration of existing housing and land allocated for housing. Given the largely rural nature of the study area and the communities within it, there are no allocated housing sites and therefore the growth identified above would occur in the wider local authority area, outside of the study area. This means that any housing growth within the study area would come forward on unallocated sites or via windfall sites through the planning process. This characteristic would lead to a low sensitivity. Despite this, it is considered that on balance a medium sensitivity should be applied to the private property and housing receptor group to account for the highest possible outcome that could occur, given the expected increase in household growth is at the higher end of the criteria bracket.

- 12.6.6 Outside the study area, there is a commitment to deliver Garden Town communities at Monkton Heathfield, Comeytrowe and Staplegrove and associated infrastructure at Taunton. Taunton would continue to be the focus of development as it has a comprehensive bus network and a rail station, and is home to major employers, education and health facilities and services. Wellington is also a sub-strategic town, expected to receive a share of new houses delivered over the next Local Plan period.
- 12.6.7 Data on private properties has been sourced from the Ordnance Survey Address Base Plus database. Those private properties and their land situated within the DCO boundary and most likely to experience 'direct' effects are listed in Appendix 12.2 Population and health preliminary impact assessment, Table 1-1. These are also shown on Figure 12.2 Private property within the study area. The properties within the DCO boundary are located between Henlade and Rapps.
- 12.6.8 Within the wider study area, there are further residential properties which may experience indirect or amenity effects due to their proximity. These have also been mapped on Figure 12.3 Community facilities within the study area and show that in general, properties are dispersed throughout the study area with concentrations in hamlets and villages including Henlade, Thornfalcon and West Hatch.
- 12.6.9 There are a total of 10 residential properties within the DCO boundary which are therefore more likely to experience direct effects from the proposed scheme. Properties within the wider study area, outside of the DCO boundary and as shown in Figure 12.3 Community Facilities within the study area are less likely to experience direct effects and more likely to experience indirect or amenity effects as a consequence of the construction and/or operation of the proposed scheme.

Community land and assets

Communities

- 12.6.10 When considering key communities, it is important to consider the region as well as the local area given the important connectivity function of the A358. The road forms part of highway connections to the larger settlements of Taunton to the north and Ilminster to the south.
- 12.6.11 Within SWTC and SSSDC local authority areas, the key trends are relevant:
- ONS Population estimates in 2019 state that Somerset West and Taunton had a population of 155,100, and South Somerset had a population of 168,300.
 - There is a significantly higher proportion of over 65s (37%) in Somerset West and Taunton compared to the UK (22.2%) and Somerset (31.9%) averages and a noticeable difference across the district with 29.3% of the former Taunton Dean population over 65, whilst 50.8% of the former West Somerset over 65.
 - In 2011, there were 353,000 cars or vans belonging to the county's population, up 44,300 (14.3%) from 2001.
 - The proportion of people reliant on a car to access work increased between 2001 and 2011.
 - Economic activity rates showed 88,500 usual residents aged between 16-64 in Somerset West and Taunton, of these 87.2% were economically active, and 95,700 usual residents aged between 16-64 in South Somerset, of these, 78.8% were economically active.

- The county's economic base revolved around human health and social work activities in Somerset West and Taunton and manufacturing in South Somerset.

12.6.12 The A358 serves low numbers of residential properties and businesses in a predominantly rural location. Relevant settlements in the local area include:

- Ilton
- Ashill
- Hatch Beauchamp
- Bickenhall
- Thornfalcon
- Ruishton
- Henlade

12.6.13 Settlements and facilities in the study area and area surrounding the proposed scheme are shown on Figure 12.3 Community facilities within the study area.

12.6.14 Taunton is the largest of the settlements in the area, situated at the north of the A358. This is the key settlement for the local area in terms of the services and facilities it provides. These include a nursery, primary school, and sports facilities.

Community land and assets

12.6.15 Figure 12.3 Community facilities within the study area shows the community assets located within 500m of the proposed scheme and these are summarised in Appendix 12.2 Population and health preliminary impact assessment, Table 1-2. This also includes recreational assets. An appropriate allocation of sensitivity is provided.

12.6.16 Community land is shown on Figure 12.4 Community land within the study area. As shown in the figure, there is no Country Rights of Way (CRoW) Access Land or CRoW Common Land within the study area. Children's Wood/Riverside Park Local Nature Reserve (LNR) is partly within the study area at Taunton and Bickenhall Orchard LNR is partly within the study area at Bickenhall. Part of the treelined area of Hatch Beauchamp Registered Park and Garden is within the study area.

Development land and businesses

12.6.17 Figure 12.3 Community facilities within the study area shows the development land and businesses located along the A358. These have been identified through desk-based work and are summarised in Appendix 12.2 Population and health preliminary impact assessment, Table 1-3.

12.6.18 This includes business and commercial premises, agricultural related businesses and tourism related businesses, such as holiday lets. Wider consideration of the effect on agricultural land holdings is presented separately in the following sections of the baseline.

12.6.19 Data has been presented where possible from publicly available sources or stakeholder engagement to help inform the sensitivity values, taking into account DMRB LA 112 *Population and human health*. Stakeholder engagement is ongoing, and this assessment would be updated and reported in the ES supporting the DCO application.

12.6.20 DMRB LA 112 *Population and human health* relates to employment sites and site area. In the majority of cases for this scheme, receptors and parts thereof which relate to the business/production of goods or services identified are less than 1 hectare (ha) in size. As such, they have been applied medium sensitivities as per DMRB LA 112 *Population and human health*. However, there are a number of receptors greater than 1ha and three receptors greater than 5ha, with an applied sensitivity of high and very high, respectively.

Agricultural land holdings

12.6.21 Effects on agricultural land and soils are presented within Chapter 9 Geology and soils, which presents Agricultural Land Classification (ALC) information and considers the effect of the proposed scheme on agricultural land and the soil resource. This chapter identifies known agricultural land holdings and outlines the use of these holdings within the study area.

12.6.22 Appendix 12.2 Population and health preliminary impact assessment, Table 1-4 and Figure 12.6 Agricultural land holdings within the study area outline the current understanding of main agricultural holdings within this study area.

12.6.23 Appendix 12.2 Population and health preliminary impact assessment Table 1-4 provides agricultural land holding reference numbers which should be used to identify the extent of farm holding boundaries when cross-referring to Figure 12.6 Agricultural land holdings within the study area. Where possible, the details of holdings have been obtained through Farm Impact Assessment meetings. At those holdings where it has not yet been possible to arrange interviews, information about agricultural holdings has been obtained through publicly available sources.

12.6.24 In order to inform the assessment of effects on agricultural holdings in accordance with DMRB LA 112 *Population and human health*, information in relation to the known use of the holding and the frequency of access to that use is provided in Appendix 12.2 Population and health preliminary impact assessment, Table 1-9. This includes information such as the need to access between parcels of land (e.g. pasture and grazing fields) and key agricultural infrastructure (e.g. milking parlour and sheering shed).

Walkers, cyclists and horse riders (WCH)

12.6.25 This section of the baseline considers all routes in the area surrounding the proposed scheme which have a legal status (e.g. PRow), are promoted for use by non-motorised travellers, or have been identified as such through consultation with stakeholder and local user groups. This section considers all groups of non-motorised users and is not restricted to walkers, cyclists and horse riders (e.g. also considers wheelchair users, and small wheeled transport such as scooters and skateboards).

12.6.26 PRow mapping data has been provided by SCC and has been taken to represent the definitive record of PRow in the study area. This reflects the definitive maps, which are a legal record of the public's rights of way in one of four categories (footpath, bridleway, restricted byway or byway open to all traffic).

12.6.27 The majority of PRow in the study area involve footpaths. The PRow that are potentially directly affected by the proposed scheme have been identified through examination of the definitive maps and site walkover work, complemented by stakeholder engagement. The proposed scheme would affect 24 footpaths.

- 12.6.28 Routes have been identified or checked through workshops and consultation events that have highlighted a number of routes used and valued by local people and user groups. The WCH stakeholder and local user groups has helped to collect and check evidence and discuss options.
- 12.6.29 A site walkover visit was undertaken to review each of the PRow identified as being potentially impacted by the proposed scheme. The results of the site walkover have helped complement stakeholder consultation work to inform an appraisal of the value of PRow and local routes and the proposed approach to assessment of those routes during construction and operation.
- 12.6.30 There are also other highways that WCH can use but that are not shown specifically on the definitive maps as PRow. DfT guidance identifies these as unclassified roads, which are local roads intended for local traffic. The vast majority (60%) of roads in the UK fall within this category. These roads are often shown and referred to as an 'other route with public access' (ORPA) on Ordnance Survey maps, indicating routes which carry public rights of some sort, but which are not recorded as PRow.
- 12.6.31 Figure 12.2 Private property within the study area shows PRow and local routes, and is summarised in Appendix 12.2 Population and health preliminary impact assessment, Table 1-5.

Human health – baseline

- 12.6.32 The health baseline considers data on health indicators such as age, pre-existing health issues (including respiratory disease and COPD, deaths from respiratory diseases, percentage of the community with long-term illness or disability, general health, life expectancy and income deprivation. The baseline also sets out data related to relevant health determinants such as air quality and noise within the study area. Information relating to community, health and educational facilities is taken from the baseline developed for the land use and accessibility section of this chapter.
- 12.6.33 Data for each ward is presented in tables specific to each health parameter and health determinant and is summarised in text.
- 12.6.34 Certain health data are not available at ward level and yet are relevant in helping to inform a broad understanding of health which can be influenced by transport schemes; therefore, local authority level data is presented in these instances.
- 12.6.35 It should be noted that the health of individuals within the study area would vary considerably and cannot be inferred from the data presented in the baseline.

Age

- 12.6.36 The age profile of the relevant areas, according to ONS mid-year population estimates, for mid-2017 [23] is shown in Table 12-10. When compared to the age profile of England, the wards included within the study area have a higher percentage of older individuals (65 years of age and older) and a lower percentage of the working age population (16-64 years of age). West Monkton had the highest percentage of individuals aged 0-15 years at 24.8%, whereas Neroche, South Somerset and Neroche, Taunton Deane had the highest percentage of individuals 65 years of age and older at 32.2% and 33.0%, respectively.

Table 12-10 Age profiles for the total resident population (%), ONS for mid-2017

Wards within the study area	Years of age			
	0-15	16-24	25-64	65 and older
West Monkton	24.8	7.7	52.9	15.3
Taunton Halcon	22.5	9.2	53.0	15.3
Taunton and Blackbrook and Holway	18.4	9.4	54.7	17.5
Ruishton and Creech	18.0	6.9	46.0	29.1
Neroche, Taunton Deane	13.5	6.1	47.4	33.0
North Curry and Stoke St Gregory	16.4	7.3	47.2	29.1
Neroche, South Somerset	14.4	6.6	46.8	32.2
Islemoor	17.1	7.6	48.5	26.8
Ilminster	18.1	8.7	46.7	26.5
Average of Wards	18.1	7.7	49.2	25.0
Average England	19.1	10.9	51.9	18.0

Deprivation

- 12.6.37 The English Index of Multiple Deprivation (IMD) 2015¹ measures relative levels of deprivation and is made up of seven 'domains' of deprivation (employment, health and disability, education, skills and training, crime, barriers to housing and services, and living environment). Table 12-11 sets out the average IMD score for each ward within the study area based on aggregated, population-weighted scores of lower super output areas (LSOA). The scores are used to rank areas according to their level of deprivation, with a larger score indicating a more deprived ward.
- 12.6.38 The study area (average of wards: 17.0) has a lower IMD score when compared to the score of England (21.8), suggesting it is less deprived. The IMD score is lowest in West Monkton (9.9) and Ruishton and Creech (9.9) suggesting that these wards are the least deprived. The IMD score is highest in Taunton Halcon (35.9) suggesting that this ward is the most deprived in the study area.
- 12.6.39 The Income deprivation domain measures the proportion of the population in an area experiencing deprivation relating to low income. The definition of low income includes both those that are out-of-work and those that have low earnings. Table 12-11 sets out the proportion of people experiencing income deprivation in the wards within the study area based on aggregated, population-weighted scores of Lower Super Output Areas (LSOA).
- 12.6.40 The study area (average: 10.7%) has a lower proportion of people experiencing income deprivation when compared to the proportion in England (14.6%), suggesting it is less income deprived. The proportion of people experiencing income deprivation is lowest in Neroche, Taunton Deane (6.2%) and Neroche, South Somerset (6.7%) and highest is in Taunton Halcon (24.5%) suggesting there is some variation in income deprivation across the study area wards.

¹ As aggregate data for wards was not available for the 2019 IMD, the 2015 IMD was used.

Table 12-11 IMD score and income deprivation percentage (2015)

Wards within the study area	IMD score	Income deprivation %
West Monkton	9.9	7.4
Taunton Halcon	35.6	24.5
Taunton and Blackbrook and Holway	19.9	15.0
Neroche, Taunton Deane	13.8	6.2
North Curry and Stoke St Gregory	15.0	7.3
Ruishton and Creech	10.2	6.9
Ilminster	14.2	11.2
Isle Moor	21.8	10.8
Neroche, South Somerset	12.4	6.7
<i>Average of Wards</i>	17.0	10.7
<i>Average England</i>	21.8	14.6

Economic activity, inactivity and unemployment

12.6.41 The 2011 Census data shows that the percentage of economically active people (employed, self-employed, unemployed but actively seeking work, and full-time students) in the study area was 80.7% which is higher than the England and Wales level (76.8%) (Table 12-12). Unemployment and economic inactivity (retired, student, looking after home or family, long-term sick or disabled, other) in the study area was 3.9% and 19.3%, which is lower than the England and Wales level at 7.6% and 23.2%, respectively (see Table 12-12). Taunton Halcon had a highest level of unemployment at 8.2% which is higher than the level for England and Wales (7.6%).

Table 12-12 Economic activity, inactivity and unemployment (%) (Census 2011)

Wards within the study area	Economically active	Unemployed	Economically inactive
West Monkton	83.9	2.0	16.1
Taunton Halcon	77.1	8.2	22.9
Taunton and Blackbrook and Holway	81.2	4.5	18.8
Ruishton and Creech	80.6	3.2	19.4
Neroche, Taunton Deane	81.0	3.2	19.0
North Curry and Stoke St Gregory	81.3	3.5	18.7
Neroche, South Somerset	79.5	2.5	20.5
Isle Moor	79.9	3.3	20.1
Ilminster	81.9	4.7	18.1
<i>Average of Wards</i>	80.7	3.9	19.3
<i>Average England and Wales</i>	76.8	7.6	23.2

General health - self reported

12.6.42 The 2011 Census [24] measured self-perceived general health of residents based on a five-point scale. The results specific to the wards included in the study area are portrayed in Table Table 12-13. The self-perceived general health of wards included within the study area have less people rating their health as bad or very bad (average: 3.1%) than the percentage in England (5.4%). Most residents

within the study area rated their health as good or very good however, this was highest in West Monkton and Neroche, Taunton Deane where 84.8% and 83.4% of residents rated their health as good or very good, respectively. Ruishton and Creech had the highest percentage of individuals rating their health as bad or very bad at 5.2% however, this is not significantly different from England (5.4%).

Table 12-13 Self rated general health (%) (Census 2011)

Wards within the study area	Very good	Good	Fair	Bad	Very bad
West Monkton	54.7	30.1	10.5	0.3	0.0
Taunton Halcon	43.4	36.5	14.3	0.5	0.0
Taunton Blackbrook and Holway	45.6	34.5	13.8	0.5	0.1
Neroche, Taunton Deane	49.6	33.8	12.1	3.7	0.8
North Curry and Stoke St Gregory	49.0	33.7	13.1	3.5	0.8
Ruishton and Creech	45.0	35.4	14.4	3.9	1.3
Ilminster	44.4	36.4	14.8	3.6	0.8
Islemoor	47.0	34.2	14.7	3.0	1.0
Neroche, South Somerset	45.1	35.8	14.8	3.7	0.6
<i>Average of Wards</i>	<i>47.1</i>	<i>34.5</i>	<i>13.6</i>	<i>2.5</i>	<i>0.6</i>
<i>Average England</i>	<i>47.2</i>	<i>34.2</i>	<i>13.1</i>	<i>4.2</i>	<i>1.2</i>

Life expectancy

12.6.43 Public Health England data shows that the 2013-2017 average life expectancy at birth² is comparable across the wards included within the study area (average: males – 80.1 years, females – 84.0 years) and is slightly higher than the average life expectancy at birth for England (males – 79.5 years, females – 83.1 years) (as shown in Table 12-14). North Curry and Stroke St Gregory had the highest male average life expectancy at birth of all wards included in the study area at 83.3 years whereas Taunton Halcon had the lowest at 76.0 years. The highest female average life expectancy at birth was observed for Ruishton and Creech at 86.7 years, whereas Taunton Halcon had the lowest at 80.1 years.

Table 12-14 Average life expectancy at birth (Public Health England 2013-2017)

Wards within the study area	Males	Females
West Monkton	80.9	82.0
Taunton Halcon	76.0	80.1
Taunton and Blackbrook and Holway	81.5	84.7
Neroche, Taunton Deane	79.1	82.4
North Curry and Stoke St Gregory	83.3	85.7
Ruishton and Creech	81.6	86.7
Ilminster	81.5	86.2
Islemoor	83.1	83.6

² Public Health England. Fingertips – Average Life Expectancy at Birth. Available online at: https://fingertips.phe.org.uk/profile/local-health/data#page/3/gid/1938133185/pat/201/par/E07000246/ati/8/are/E05008916/iid/93283/age/1/sex/2/cid/4/page-options/ovw-do-0_car-do-0

Neroche, South Somerset	80.8	85.1
<i>Average of Wards</i>	<i>80.9</i>	<i>84.1</i>
<i>Average all England</i>	<i>79.5</i>	<i>83.1</i>

Long-term illness or disability

12.6.44 Data from the 2011 Census shows that the percentage of people who reported having a limiting long-term illness or disability in the study area (17.9%) was broadly in line with the percentage in England (17.6%) (as shown in Table 12-15). Of all the wards, Ruishton and Creech had the highest proportion of people reporting limiting long-term illness or disability at 20.3%, while West Monkton had the lowest at 14.4%.

Table 12-15 Percentage of people who reported having a limiting long-term illness or disability (Census 2011)

Wards within the study area	Percentage (%) of people who reported having a limiting long-term illness or disability
West Monkton	14.4
Taunton Halcon	18.4
Taunton and Blackbrook and Holway	17.9
Neroche, Taunton Deane	18.2
North Curry and Stoke St Gregory	17.1
Ruishton and Creech	20.3
Ilminster	18.2
Islemoor	18.1
Neroche, South Somerset	18.8
<i>Average of Wards</i>	<i>17.9</i>
<i>Average all England</i>	<i>17.6</i>

Respiratory disease and chronic obstructive pulmonary disease

12.6.45 Public Health England data from 2013-2017 shows that the standard mortality ratio (SMR) for deaths from respiratory diseases (for all ages) and standard admission ratio (SAR) for emergency hospital admissions for COPD is higher in wards located closer to the city of Taunton (Table 12-16). The SMR for deaths from respiratory diseases (all ages) was 121.1 per 100 and 100.7 per 100 in Taunton Halcon and Taunton Blackbrook and Holway, respectively. The SAR for emergency hospital admissions for COPD was 121.3 per 100 and 162.7 per 100 for Taunton Halcon and Taunton Blackbrook and Holway, respectively. These two wards had the highest standardised ratio of all wards included within the study area for these indicators.

Table 12-16 SMR (per 100 people) for deaths from respiratory diseases (all ages) and SAR (per 100 people) for emergency hospital admissions for COPD (Public Health England 2013-2017)

Wards within the study area	Deaths from respiratory diseases, all ages, SMR	Emergency hospital admissions for COPD, SAR
West Monkton	95.3	65.7
Taunton Halcon	121.1	121.3

Wards within the study area	Deaths from respiratory diseases, all ages, SMR	Emergency hospital admissions for COPD, SAR
Taunton and Blackbrook and Holway	100.7	162.7
Neroche, Taunton Deane	90.8	51.3
North Curry and Stoke St Gregory	59.9	61.9
Ruishton and Creech	60.7	61.9
Ilminster	60.8	83.5
Islemoor	90.1	59.2
Neroche, South Somerset	66.0	83.5
<i>Average of wards</i>	82.8	83.4
<i>England (SMR)</i>	100	100

Vulnerable groups

12.6.46 The baseline profile suggests that there are numerous vulnerable groups within the study area which are considered to have high relevance to the proposed scheme. The vulnerable groups identified include, but are not limited to:

- age related groups (children/young people and older individuals)
- income related groups (people on low income/unemployed)
- people with poor health

12.6.47 Table 12-17 identifies the vulnerability of these groups as defined in Table 12-2 and would therefore be given close consideration within the assessment.

Table 12-17 Population vulnerability within the study areas

Wards within the study area	Children and young people	Older people (65+)	People on low incomes/unemployed	People with poor health
West Monkton	High	Medium	Low	Low
Taunton Halcon	High	Medium	High	Medium
Taunton and Blackbrook and Holway	Medium	Medium	Medium	Medium
Neroche, Taunton Deane	Low	High	Low	Medium
North Curry and Stoke St Gregory	Medium	High	Low	Medium
Ruishton and Creech	Medium	High	Low	High
Ilminster	Medium	High	Medium	Medium
Islemoor	Medium	High	Medium	Medium
Neroche, South Somerset	Low	High	Low	Medium

Recreational and education facilities

12.6.48 Refer to the land use and accessibility baseline of this chapter for details.

Green/open space

12.6.49 Refer to the land use and accessibility baseline of this chapter for details.

Healthcare facilities

12.6.50 Refer to the land use and accessibility baseline of this chapter for details.

Public Rights of Way (including bridleways), cycle ways, non-designated public routes

12.6.51 Refer to the land use and accessibility baseline of this chapter for details.

Public transport routes

12.6.52 Data on public transport routes is being collected and would be included in the ES supporting the DCO application.

Air quality

12.6.53 Full baseline conditions related to air quality are found in Chapter 5 Air quality. There are currently three Air Quality Management Areas (AQMAs) within 200m of the ARN (study area for air quality assessment). These are:

- East Reach AQMA declared by SWTC
- Henlade AQMA declared by SWTC
- Yeovil AQMA declared by SSDC

12.6.54 East Reach AQMA and Henlade AQMA were both declared in 2003 for exceedances of the annual mean nitrogen dioxide (NO₂). The East Reach AQMA is located approximately 2km west of the proposed scheme and the Henlade AQMA is located approximately 300m north.

12.6.55 The Yeovil AQMA was declared in 2002 for exceedances of the annual mean NO₂. It is located approximately 17km east of the proposed scheme.

12.6.56 Public Health England data for 2018 shows that the fraction of mortality attributable to air pollution in Somerset was 4.2% in 2019 which is lower than the average fraction for England (5.2%) [6]. No data for SWTC was available.

Noise

12.6.57 Full baseline conditions related to noise are found in Chapter 11 Noise and vibration. Ambient noise environment conditions would be observed using baseline noise surveys when traffic flows are considered representative of the baseline conditions in the area.

12.6.58 There are eight Noise Important Areas (NIA) along the A358 as listed below:

- NIA Number 3497, Taunton, Somerset
- NIA Number 3498, Taunton, Somerset
- NIA Number 3499, Taunton, Somerset
- NIA Number 3500, Taunton, Somerset
- NIA Number 3501, Taunton, Somerset
- NIA Number 3502, Taunton, Somerset
- NIA Number 12939, Taunton, Somerset
- NIA Number 12940, Taunton, Somerset

12.6.59 Public Health England [7] data for 2018/19 shows that the rate of complaints (per 1,000 population) about noise is 2.1 in South Somerset and 2.2 in Somerset West and Taunton, both of which are lower than the rate in England (6.8).

Sources of potential pollution/contamination (based on historical and current land use)

12.6.60 As stated in Chapter 9 Geology and soils, the study area is a predominately rural setting; however, a number of potentially contaminative land uses have been identified including historical landfills, sewage works, commercial activities and fuel storage sites and evidence of made ground of unknown quality. If disturbed,

these could pose a threat to human health. The following potentially contaminated land sites have been identified:

- On-site (direct interaction with proposed alignment):
 - Former Thornfalcon Refuse Tip/Thornfalcon Tip - the proposed slip embankment to Ashe Farm Road passes through the landfill and a proposed farm access track.
 - GWR infilled cutting at Home Farm and West Hatch intersected by both the existing and proposed route.
 - Former inert Ashill bypass Site A Landfill, located directly on the proposed alignment and new link road.
- Off-site (within 250m of proposed centreline)
 - Near Dairy Farm landfill.
 - Texaco service station and motorhome dealer at Mattock's Tree Hill.
 - Foresters Garden Buildings north-west of West Hatch Lane, manufacturers of timber products.
 - Hatch Green Garage and PFS at Hatch Green.
 - Former Ashill petrol filling station, (Stewley Cross).
 - Former Butlers Fuel Depot, Kenny Lane, Ashill.
 - Ashill Sewage Treatment Works.
 - Land east of Bow Bridge and Saw Mills.
 - Shell petrol filling station, (Horton Cross).

12.6.61 Other areas of potentially contaminated land have also been identified within 250m from centre of the proposed scheme:

- depot at Greenway Lane
- farmyards (potential contamination sources include fuel tanks and slurry pits)
- builders' yard at Hatch Beauchamp
- former Horlick's site former dairy and cattle breeding centre
- presence of made ground associated with existing road construction and the immediate environment of the route corridor, infilled disused quarries and former gravel pits

12.6.62 Priority sites of potential land contamination which meet the Homes and Communities Agency (HCA) criteria of 'moderate' risk [23] are shown on Figure 9.7 Public Rights of Way Within the Study Area. These have been subject to a Tier 1 preliminary (qualitative) risk assessment (PRA) and are to be further investigated as part of the proposed ground investigation for the proposed scheme (refer to Chapter 9 Geology and soils).

Landscape amenity

12.6.63 Full baseline information relating to the landscape are set out in Chapter 7 Landscape. In summary, the proposed scheme passes through three National Character Areas (NCAs):

- NCA 140, Yeovil Scarplands [25], for approximately 1.8km at the southern end of the proposed scheme.
- NCA 143, Mid Somerset Hills [26], for the majority of the proposed scheme length.
- NCA 146, Vale of Taunton and Quantock Fringes [27], for approximately 1.6km at the northern end of the proposed scheme.

- 12.6.64 NCA 147, Blackdowns [28], is located outside of the proposed scheme's footprint, but lies within the study area, situated approximately 1.5km to the south-west at its nearest point.
- 12.6.65 Blackdown Hills Area of Outstanding Natural Beauty (AONB) lies predominantly within the Blackdowns NCA.
- 12.6.66 The landscape through which the proposed scheme passes is rural in nature with open views across the landscape and access into the landscape via numerous PRow.

Road safety

- 12.6.67 Road safety data was obtained from the Combined Modelling and Appraisal (ComMA) Report [29] published as part of the options selection stage, which is the most recent data available for the proposed scheme. An updated accident analysis based on 2015 to 2019 data would be undertaken shortly and would be reported in the preliminary design stage ComMA [29].
- 12.6.68 Personal Injury Accident (PIA) data for the 5-year period available (January 2010 to December 2014) showed that there was a total of 63 accidents on the A358 between M5 junction 25 and the A303 at Southfields roundabout, of which one was fatal and 20 were serious.
- 12.6.69 The A358 accident rate per billion vehicle–kilometres travelled for this period was 110, which compares to a national accident rate of 171, suggesting that the frequency of accidents is lower within this area.
- 12.6.70 Public Health England [8] data for 2016-2018 for the number of people reported killed or seriously injured (KSI) on roads (per 100,000 population) in South Somerset and Somerset West and Taunton was 33.3 and 32.8 (crude rate per 100,000), respectively, which is lower than the KSI in England on average (42.6).

12.7 Potential impacts

- 12.7.1 This section provides an overview of potential impacts from the proposed scheme on the broad receptor groups identified within the methodology above and on human health outcomes, before any mitigation or enhancement has been incorporated.

Land use and accessibility

Private property and housing

- 12.7.2 This includes potential impacts on residential property and land receptors as follows:
- Demolition of residential property
 - Loss of land associated with residential property
 - Loss of or impacts on land allocated for housing growth
 - Change in attribute such as noise environment or sense of tranquillity

Community land and assets

- 12.7.3 This includes potential impact on community assets, facilities and land which could include:
- Construction and operational effects on community facilities such as village halls, schools and religious premises.

- Construction and operational effects on tourism and recreational facilities within the vicinity of the proposed scheme, including direct effects on the receptor as well as indirect effects associated with any impacts on users of the receptors (e.g. amenity/perceived effects).
- Potential effects on other land (e.g. open space land) during construction and operation.

Development land and businesses

12.7.4 This includes potential impacts on commercial property and businesses, and land allocated for employment growth as follows:

- Construction and operational effects on commercial property and business receptors (including tourism businesses).
- Change in attributes of business receptors (e.g. accessibility).
- Loss of or impacts on land allocated or identified for employment/business growth.

Agricultural land holdings

12.7.5 The potential effects of the proposed scheme on agricultural land holdings all occur during the construction phase, and include the following:

- Temporary and permanent loss of agricultural land.
- Severance of land from agricultural infrastructure including increased accessibility issues resulting from the restructured local highway network.
- Demolition of agricultural infrastructure including buildings, tracks, irrigation mains.
- Disturbance of agricultural operations including noise, dust and increased difficulty accessing farmland due to construction traffic.

Walkers, cyclists and horse riders

12.7.6 This includes an assessment of potential impacts arising from the proposed scheme on WCHs as follows:

- Potential effects on WCHs during construction including severance of key routes, any diversions required and associated impacts in relation to journey length and amenity.
- Potential effects on WCHs during operation including any severance or diversions to key routes and the potential for enhancements to the WCH network due to new overbridges and underbridges. Consideration has also been given to journey length effects and amenity impacts.

Human health

12.7.7 The assessment of human health considers how changes that result from the proposed scheme would affect health determinants during both construction and operation. Health determinants considered include:

- Healthcare services and other community facilities
- Transport and connectivity
- Access to open space and nature
- Air quality
- Noise environment
- Landscape and visual amenity

- Sources of pollution (pollution pathways)
- Access to employment and training

12.7.8 Changes to the health determinants and the likely health outcomes resulting from this are considered in more detail in the assessment section of this chapter.

12.7.9 Based on a consideration of the population vulnerabilities identified for each of the study wards, alongside an understanding of the likely population exposure (number of people affected) to each of the changes in health determinants, population sensitivity within each of the wards is assigned as set out in Table 12-18.

Table 12-18 Population sensitivity within each ward per health determinant

Health determinant	West Monkton	Taunton Halcon	Taunton and Blackbrook and	Neroche, Taunton Deane	North Curry and Stoke St Gregory	Ruishton and Creech	Ilminster	Isle Moor	Neroche, South Somerset
Healthcare services and other community facilities	Low	Low	Low	Medium	Low	Medium	Low	Low	Medium
Transport and connectivity	Low	Low	Low	Medium	Low	Medium	Low	Low	Medium
Access to open space and nature	Low	Low	Low	Low	Low	Low	Low	Low	Low
Air quality	Low	Low	Low	Medium	Low	Medium	Low	Low	Medium
Noise environment	Low	Low	Low	Medium	Low	Medium	Low	Low	Medium
Landscape and visual amenity	Low	Low	Low	Low	Low	Low	Low	Low	Low
Sources of pollution (pollution pathways)	Low	Low	Low	Medium	Low	Medium	Low	Low	Medium
Access to employment and training	Low	Low	Low	Low	Low	Low	Low	Low	Low

12.8 Design, mitigation and enhancement measures

Construction mitigation

12.8.1 This section outlines the design and enhancement measures implemented during construction and operation, as well as any planned enhancements. Mitigation measures incorporated in the design and construction of the proposed scheme are reported as embedded mitigation in Chapter 2 The Project. Prior to the implementation of mitigation, the proposed scheme has the potential to affect population and health during construction and operation, both beneficially and adversely.

12.8.2 An Environmental Management Plan (EMP) that would be submitted as part of the ES and in support of the DCO application would provide a list of outline mitigation measures to be implemented during the construction stage.

- 12.8.3 Where access is affected to private properties and businesses, temporary alternative access will be provided safely and as appropriate.
- 12.8.4 Where the construction works would affect access to existing tourism receptors, temporary alternative access arrangements would be provided in agreement with the receptor.
- 12.8.5 Necessary access arrangements during construction will be detailed in a Construction Traffic Management Plan (CTMP), in addition to details of stopped up road and new access provided.
- 12.8.6 Agricultural land required temporarily during construction would be returned to its original use and condition. Further details on the restoration of agricultural land are provided in Chapter 9 Geology and soils. The use of agricultural land would be minimised through the rationalisation of construction sites, including the use of balancing ponds and mitigation planting and to place construction works/compounds in the least sensitive locations.
- 12.8.7 Severance during construction would be reduced through the appropriate construction of agricultural crossings, access tracks and replacement field entrances, where needed. The siting of such mitigation measures would be informed through consultation with affected landowners where possible.
- 12.8.8 Potential indirect amenity and agricultural holding impacts relating to noise, dust, the movement of construction vehicles and general construction works would be mitigated through considerate construction management including the use of screening (temporary or permanent), which would be outlined in further detail in the EMP. The EMP preparation and delivery during construction would involve the local community through the appointed Public or Agricultural Liaison Officer.
- 12.8.9 Once finalised the EMP would include the details provided in the PRoW Management Plan would to be submitted with the ES which presents the approach to managing the interactions of the proposed scheme with the PRoWs during both the construction and operational phases of the proposed scheme.
- 12.8.10 A planned approach would be taken to the management of PRoW during the construction and operation of the proposed scheme, ensuring public safety while reducing disruption to users. This includes managing closures where possible (e.g. managed crossing and/or early re-provision) retaining rights of way as per current routes and seeking to reduce the effects on users. This would include:
- Use of signage where PRoW can remain open, but users need to be warned of the presence of construction vehicles (local management).
 - Implementation of short, temporary closures where local works might affect safety of users (local closures).
 - Closure of/extinguishment of a PRoW following the early implementation of an alternative/new route (e.g. via a new overbridge/underbridge) (early re-provision).
 - Avoid closure of/extinguishment of a PRoW without re-provision (e.g. where works sequencing would not provide a new crossing in advance on the carriageway works) and/or permanent extinguishment of a PRoW (full closure).
 - Provision of new crossings/routes as part of the proposed scheme (new routes).

- 12.8.11 It is also assumed that during construction, Highways England or its contractor would provide a Public Liaison Officer and/or operate a Community Relations team with contact details to be provided on relevant signage located along the PRow network (for example, giving notice of temporary closures/diversions). Concerns around condition can therefore be flagged through this procedure and Highways England would explore any short-term reinstatement work where necessary. Any concerns raised would be shared with the relevant Council PRow Officers for discussion when appropriate.
- 12.8.12 Best practice construction methods would also seek to reduce if not avoid indirect temporary effects on users of WCH routes, for example with dust suppression methods of construction.
- 12.8.13 Given that many of the effects on the PRow network relate to the proposed scheme severing sections of the network, Highways England propose to implement early re-provision of PRow as part of the early construction phase of the project, or diverted along new Private Means of Access as a temporary alternative.

Operational mitigation

- 12.8.14 Landscape mitigation measures are detailed within the landscape and visual effects chapter of the Chapter 7 Landscape. Such measures consist of landscape planting, principally designed with the intention of mitigating negative effects and benefiting nature conservation and biodiversity, landscape integration and visual amenity.
- 12.8.15 The need for additional signage beyond typical highway signage, for example to tourism assets, would be discussed with Highways England and the relevant local authority as the design process continues.
- 12.8.16 Once finalised, the EMP would incorporate the Public Rights of Way Management Plan (submitted as part of the ES) which sets out the operation mitigation for walkers, cyclists and horse riders and other users of PRow/highway with public access. The PRow Management Plan supports the potential health benefits related to improved air quality and the potential for enhanced active travel and recreational opportunities. Once operational, the proposed scheme would also offer improved highway safety.

Enhancement

- 12.8.17 There are opportunities to enhance the options for local communities to access open spaces and to utilise well designed and integrated active travel options such as providing cycle paths that connect existing residential areas to each other.

12.9 Assessment of likely significant effects

- 12.9.1 This section presents the assessment of likely significant effects on population and health resulting from the construction and operation of the proposed scheme. The assessment of effects takes into account the potential impacts to each receptor following the implementation of embedded and essential mitigation measures to determine the significance of the residual effects.

Effects on private property and housing during construction

- 12.9.2 The assessment of effects on private property and housing considers the potential effects on residential properties within the vicinity of the proposed scheme, as well potential effects on residential development land. As described in the baseline, 10 residential properties are located within the DCO boundary of the proposed scheme.
- 12.9.3 The potential direct effects on residential properties during construction are shown in Table 12-19 which considers the potential effects, magnitude of this effect and subsequent significance.

Table 12-19 Effects on residential properties – construction

Receptor	Sensitivity	Potential effect(s)	Magnitude	Significance
Henlade Farm House, Stoke Road, Henlade	Medium	Direct acquisition and demolition	Major	Large adverse (not considered to be moderate because of total demolition)
Meadow View, Stoke Road, Henlade	Medium	Direct acquisition and demolition	Major	Large adverse (not considered to be moderate because of total demolition)
Bath Cottage, West Hatch, Taunton, TA3 5RH	Medium	Direct acquisition and demolition	Major	Large adverse (not considered to be moderate because of total demolition)
Keirles, Thornfalcon, TA3 5NG	Medium	Partial removal of land as a result of the construction of the proposed scheme compromising the viability of the property and introducing severance.	Moderate	Moderate adverse
Ash Cross Cottage, Ash Road, Thornfalcon, TA3 5NW	Medium	Introduction of severe severance with limited accessibility provision.	Moderate	Moderate adverse
Little Ashe, Ash Road, Thornfalcon, TA3 5NW	Medium	Introduction of severe severance with limited accessibility provision.	Moderate	Moderate adverse
Chase Cottage, West Hatch, TA3 5RG	Medium	Introduction of severance with limited accessibility provision.	Moderate	Moderate adverse
Land Plat, Stewley, Ashill, TA19 9NJ	Medium	A discernible change in environmental attributes and quality.	Minor	Slight adverse
April Cottage, Rapps, Ilminster, TA19 9LQ	Medium	A discernible change in environmental attributes and quality and introduction of severance with limited accessibility provision during construction.	Moderate	Moderate adverse

12.9.4 There are three demolitions required to private property, which are considered to be permanent effects. Where no demolition or land take is proposed, effects on private property and housing during construction would be temporary for the duration of the construction phase, with appropriate mitigation and management to be put in place through the CTMP and EMP.

Effects on private property during operation

12.9.5 The potential effects on private property and housing during operation are shown in Table 12-20 which considers the potential effects, magnitude of this effect and subsequent significance.

Table 12-20 Effects on residential properties – operation

Receptor	Sensitivity	Potential effects(s)	Magnitude	Significance
Keirles, Thornfalcon, TA3 5NG	Medium	Introduction of severe severance which compromises overall viability of property.	Moderate	Moderate adverse
Ash Cross Cottage, Ash Road, Thornfalcon, TA3 5NW	Medium	Introduction of severe severance which compromises overall viability of property.	Moderate	Moderate adverse
Little Ashe, Ash Road, Thornfalcon, TA3 5NW	Medium	Introduction of severe severance which compromises overall viability of property.	Moderate	Moderate adverse
Chase Cottage, West Hatch, TA3 5RG	Medium	A discernible change in environmental attributes and quality but does not compromise overall viability of property.	Minor	Slight adverse
Land Plat, Stewley, Ashill, TA19 9NJ	Medium	A discernible change in attributes and environmental quality but does not compromise overall viability of property.	Minor	Slight adverse
April Cottage, Rapps, Ilminster, TA19 9LQ	Medium	Partial damage to the property's features including substantial amendment to access.	Moderate	Moderate adverse

Community land and assets

12.9.6 This section of the assessment considers effects on the communities in the study area with a focus on assets, facilities and land.

12.9.7 For the purpose of this assessment, this section considers communities in relation to community land and assets rather than private property and housing, which is considered above. As such, likely effects on communities as a whole (local population) and then community assets/facilities and land are considered

12.9.8 Tourism and recreational facilities are also considered within this section of the assessment, recognising their multi functioning role in serving the local community as well as visitors to the area.

Communities

- 12.9.9 There are a number of settlements on and along the proposed scheme, which rely on the A358 for direct access. Planned works are to be undertaken both on-line on the existing A358 route and off-line within the wider area. It is recognised that on-line planned works may result in direct demolition or land acquisition, while off-line may result in a combination of construction effects which could lead to potential effects on access to facilities or services (e.g. footpath closures, increased construction traffic on the road network).
- 12.9.10 During construction, it is acknowledged that some individual properties could be adversely affected by noise and vibration (see Chapter 11 Noise and vibration). In addition, the character of the main settlements located along/adjacent to the A358 such as Henlade and West Hatch could be affected by construction activities including the presence of compounds, earthworks and machinery. Noise effects would be temporary and at their worst in close proximity to the proposed scheme.
- 12.9.11 Traffic management would help to prevent impacts on these communities by restricting construction traffic to certain routes and nuisance can generally be limited through considerate construction management including the use of screening (temporary or permanent), which would be outlined in further detail in the EMP.
- 12.9.12 Mitigation has been put in place but given the location of the communities near to the construction of the proposed scheme, it is assessed that the proposed scheme would lead to six significant effects on communities during construction, largely as a result of the introduction of severance as summarised in Appendix 12.2 Population and health preliminary impact assessment, Table 1-6.
- 12.9.13 Given the geographic location of the proposed scheme and the type/volume of construction skills required, it is anticipated that a proportion of the construction workforce would be brought into the area and therefore made up of workers travelling from outside the area and staying locally. This brings both potential beneficial and negative impacts for the local economy and the accommodation sector with the presence of non-local staff within the workforce leading to demand for accommodation within the study area. The settlements near to the proposed scheme have a good supply of serviced and non-serviced accommodation and would likely be able to accommodate the workforce demand. This could bring beneficial effects to the local accommodation sector during the construction programme, bringing additional trade at their quietest times of the year.
- 12.9.14 During the peak tourist season, when occupancy rates are generally higher, the additional requirements for long-term accommodation could place increased pressure on providers. This may require workers to access accommodation in the wider region and travel to site. However, this is not expected to result in any significant effect on communities and could lead to minor beneficial effects in terms of accommodation/occupancy and associated spend in local communities for goods and services.

Community land and assets during construction

- 12.9.15 Highways England has sought to avoid direct effects on communities, community land and assets through scheme design and no direct effects are anticipated in terms of demolition in relation to community assets.

- 12.9.16 Potential effects on community assets during construction of the proposed scheme are explored further in Appendix 12.2 Population and health preliminary impact assessment, Table 1-6.
- 12.9.17 In attributing a magnitude value to receptors, the assessment has drawn on proximity to the proposed scheme and therefore the potential effects of construction in terms of general accessibility (e.g. effects of traffic management) and wider potential indirect effects from construction activities.
- 12.9.18 The proposed scheme includes changes to access provision at Ivy House Social Club, Somerset Progressive School, Huish Woods Scout Campsite, Ashill Village Hall, Ashill Primary School and West Hatch Village Hall. Whilst it is not considered that these requirements would compromise overall viability or use of the facilities, it is considered that the proposed scheme would lead to a discernible change in attributes of moderate magnitude. When considered against the receptors' medium and high sensitivity, the moderate magnitude leads to potential moderate and large adverse effect, which would be significant, although temporary for the duration of the works, as set out in Appendix 12.2 Population and health preliminary impact assessment, Table 1-6. The CTMP would ensure access is available to the facility during construction of the proposed scheme.
- 12.9.19 The remainder of effects on all other community receptors are indirect and relate to potential effects associated with more general construction effects. This include noise and dust effects of the construction works, noise and vibration effects for HGV movements, and visual impacts. A CTMP would identify the key areas where the works impact on the existing A358 traffic flow and key receptors, with solutions to phase the construction works in such a way as to reduce the disruption and impact on the travelling public, as well as access to key services and facilities. With good design which ensures ongoing access to facilities, and with mitigation measures defined within the EMP and CTMP, it is not anticipated that construction would lead to any significant effects on the identified community assets.

Community land and assets during operation

- 12.9.20 During operation of the proposed scheme, it is anticipated that there would be an overall reduction in the number of vehicles passing through communities within the areas surrounding the A358. Improved alignment is also likely to reduce the number of accidents. This primarily relates to the proposed scheme addressing the mixed road typology and the high traffic flows on many sections of the route which experience traffic demand above that for which it was designed. As such, reduced delays, fewer accidents and improved journey time reliability as a result of the proposed scheme are likely to contribute positively to the safety of communities, and their accessibility to facilities and services during operation, with overbridges provided as part of the proposed A358 in order to facilitate greater connectivity across the proposed scheme. This is considered to lead to a slight beneficial effect in terms of accessibility for local communities along the proposed scheme.
- 12.9.21 There would be limited employment benefit as result of the proposed scheme during its operation, beyond typical maintenance arrangements. However, benefits of the proposed scheme could continue to be experienced by the local labour force as result of skills and training learned from working on or as part of the supply chain servicing the proposed scheme's construction.

- 12.9.22 Highways England and its contractor would discuss initiatives where legacy benefits could be realised and achieved, for example with targeted recruitment and training as well as apprenticeships utilising partnership arrangements with local educational institutions. As a result, assuming that there would be local construction worker and training benefits, as well as supply chain service benefits (with associated multiplier effects) there could be slight beneficial impacts within the local and regional economy during operation of the proposed scheme.
- 12.9.23 None of the identified community assets would be directly affected during operation of the proposed scheme with impacts associated with demolition or land take having occurred during the construction stage.
- 12.9.24 During operation, the proposed scheme is anticipated to lead to improvements in travel conditions. This would be particularly beneficial at peak times during summer months when there is typically 30% growth in additional traffic along the A303 corridor, which could help remove a perceived barrier to accessibility, with associated benefits in terms of access to community facilities in the study area. Overall, the proposed scheme could therefore lead to slight beneficial effects on the identified receptors in terms of accessibility.

Open space – construction

- 12.9.25 The three open spaces within the study area have a high sensitivity given their frequent use and access to majority of the community. However, given the substantial distance between the DCO boundary and the open spaces, which are all only partially within the 500m buffer, the magnitude of impact is considered to be negligible as a result of a very minor detrimental alteration to the characteristics of the open space. It is therefore assessed that there is a neutral/slight adverse construction significance given the discernible change in environmental quality expected in close proximity to the open spaces.

Open space – operation

- 12.9.26 None of the open space assets would be directly affected during operation of the proposed scheme with impacts associated with the changes to environmental quality having occurred during the construction stage.

Development land and businesses

- 12.9.27 The consideration of effects on development land and businesses focusses on businesses at risk (including severance) or from which land would be required to facilitate construction and/or operation of the proposed scheme. It also considers potential effects (e.g. sterilisation) of land allocated for development or subject to a planning application, within the study area.

Development land and businesses during construction

- 12.9.28 The design of the proposed scheme has, where possible, avoided direct impacts on development land and businesses and appropriate embedded mitigation has been developed in order to mitigate potential effects where possible (e.g. early reprovision of access to ensure accessibility during construction).
- 12.9.29 Access arrangements would be maintained during construction to all identified commercial property and businesses. Through scheme design, appropriate access would continue to be provided. Where concerns have been raised by landowners and tenants about the proposed scheme and its potential effects on

business viability, landowner engagement has helped inform design with appropriate mitigation measures agreed and incorporated as part of the proposed scheme. Where such mitigation has been provided, a summary is given in Appendix 12.2 Population and health preliminary impact assessment, Table 1-8.

- 12.9.30 The proposed scheme therefore only has the potential to lead to significant effects on those businesses that are lost (in part or in full). For other businesses and commercial property during construction there could be short-term impacts as a result of disruption and diversions for access.
- 12.9.31 Best practice construction techniques would be used to help reduce and avoid where practicable any likely adverse impacts. Details would be provided within the EMP and CTMP when submitted as part of the DCO application.
- 12.9.32 As part of the proposed scheme's construction, there would no direct effects association with demolition to development land and businesses.
- 12.9.33 There is some partial removal to access and acquisition of land at the Nags Head Tavern, likely to compromise the viability of the business giving it a moderate magnitude of impact. Combined with its medium sensitivity, this leads to moderate adverse construction effects.
- 12.9.34 Severance and disruption to access due to local roads being stopped up is likely to affect Orchard Poultry (Livestock breeder), Jordan's Estate Glamping (camp site), Blackdown Shepherds Huts (manufacturing), JM Glass Ltd (Glass Studio) and the Ginger Bread House (B&B), resulting in a moderate magnitude of impact. When combined with their medium sensitivity, this would also lead to moderate adverse construction effects.
- 12.9.35 Despite only a discernible change in attributes and environmental quality during construction activities resulting in a minor magnitude of impact, the very high sensitivity of strategic employment land allocations at Southfield roundabout (allocations ME/ILM/3, ME/ILM/4, and ME/ILMI/5 for mixed business uses) and Nexus 25 roundabout at Junction 25 of the M5 motorway (mixed employment uses including research and development and creating more than 3,500 jobs), result in moderate adverse construction effects.
- 12.9.36 With appropriate mitigation, the construction of the proposed scheme is not anticipated to bring any further significant adverse effects on business receptors. It would be important for the CTMP when developed to ensure that access is maintained.

Development land and businesses during operation

- 12.9.37 During the operation of the proposed scheme and its access arrangements, it is not considered that development land and businesses identified within the study area would experience significant adverse effects, given that access would be maintained to all receptors.
- 12.9.38 Overall, the proposed scheme is envisaged to improve journey time reliability and safety, which would serve to improve traffic conditions in the local area. These improvements would not only overcome current problems experienced along the A358, but would also help to accommodate a forecast growth in traffic. The proposed scheme corridor is subject to the pressures brought about through traffic growth, something which is forecast to increase as local authorities along the length of the proposed scheme seek to deliver on their employment allocation,

especially as the economic outlook improves. The proposed scheme seeks to support economic growth, particularly by facilitating growth in employment and key locations and centres along the A303, A358 and A30 corridor and to the South-West region. The Nexus 25 development has stated that a high-quality route on the SRN, providing smooth flows of traffic, efficiency and connections to London and the South-East is a key factor in contributing to the success of the business. As such, some beneficial effects are likely to be experienced by businesses that rely upon access to the highway network and/or benefit from people travelling through the area. The operation of the proposed scheme is therefore considered to lead to a minor beneficial change for business receptors, which are of medium sensitivity. This would lead to a slight beneficial effect, which would not be significant.

Agricultural land holdings

Agricultural land holdings during construction

- 12.9.39 This section of the assessment considers the potential effects of the proposed scheme on agricultural holdings through land take, demolition or severance/accessibility restrictions. In line with DMRB LA 112 *Population and human health* the assessment is focused on the loss of or damage to key characteristics, features or elements of the agricultural holding and potential effect of this change on viability.
- 12.9.40 In terms of the area of land required from each holding, assessment of temporary effects assumes that all agricultural land within the study area would be unavailable to agricultural land holdings during the construction period. The assessment of permanent construction effects has been based on the footprint of the highway, junctions, embankments and cuttings only.
- 12.9.41 The proposed scheme would affect 37 agricultural land holdings temporarily during construction. Following the restoration of agricultural land, 31 holdings would continue to be affected permanently.
- 12.9.42 In terms of temporary construction effects, 23 agricultural land holdings would experience very large, large or moderate temporary adverse effects which are considered significant. The majority of these are related to the proportion of agricultural land required.
- 12.9.43 17 agricultural land holdings would experience a large or moderate permanent adverse effects which are considered significant. The majority of these are related to the proportion of agricultural land required, although severance effects are also relevant.
- 12.9.44 Further detail on the assessment of temporary and permanent construction effects is presented in Table 1-9 of Appendix 12.2 Population and health preliminary impact assessment.

Agricultural land holdings during operation

- 12.9.45 As the permanent removal of land from agricultural use and severance would occur during the construction phase of the proposed scheme, it is not considered that any further effects would occur during operation of the proposed scheme.

Walkers, cyclists and horse riders

General approach to assessment of WCH

- 12.9.46 The assessment of effects on WCH considers direct effects on the routes where they are crossed by the proposed scheme and/or affected during construction (e.g. used in full or in part as construction accesses or crossed by construction routes).
- 12.9.47 The assessment also considers indirect amenity effects on users of routes within an area up to 500m from the DCO boundary, but with a focus on routes where they run parallel to the proposed scheme or construction works. When considering indirect amenity effects, the assessment has been completed in the context of the current baseline.
- 12.9.48 As explained as part of the baseline, the proposed scheme also has the potential to affect unclassified roads or ORPAs that interface with the proposed scheme. Those that are affected by works are also shown on Figure 12.2 Private property within the study area.
- 12.9.49 Figure 12-7 Public Rights of Way within the study area shows proposed stopping up, diversions and new routes for WCH and other users of highways and local routes with public access rights.
- 12.9.50 The proposed scheme includes a number of elements that either ensure continued access for WCH or bring improvements in terms of current accessibility and severance as follows:
- Approximately 1.5km of new footpath linking T26/4 at Nexus 25 roundabout to T22/5 to the west of the proposed scheme. The new stretch of pathway provides walkers with enhanced visitor experience by providing long distance views south onto Blackdown Hills.
 - Stoke Road (Henlade) overbridge would significantly reduce severance between communities in Henlade. It also provides safe and direct access for the existing popular cycling route between Haydon and Stoke St Mary to the south of the proposed scheme to Ruishton to the north.
 - Approximately 5km of proposed cycle route linking into the traffic-free cycle route on the existing A358 to the north of the proposed scheme, south of Nexus 25 roundabout and connecting to the existing signed cycle route at West Hatch Lane.
 - Proposed bridleway to connect Greenway Lane and Ash Road, and through Mattock's Tree Green junction roundabout. The access tracks would include provision for WCHs, helping connect into existing sections of footpaths and cycleways to improve connectivity for WCH.
 - New Griffin Lane underbridge providing a route across the proposed scheme for the East Dean Way and Taunton Cycle Trail. This would enhance the visitor experience of this important long-distance route, bringing a significant improvement on the existing situation.
 - Approximately 7km of proposed cycle route originating in Hatch Beauchamp and ending at Lower Horton. The cycle route would cross over the proposed scheme at Capland, then continue south along the west side of the proposed scheme. The proposal would also link popular cycle routes on Wood Road in Wood and Broadway Road leading to Broadway Pound. The cycle route would travel through Ashill, and eventually end in Lower Horton where it connects

with existing cycle routes. The route provides safe routes for both recreational and commuter journeys.

- New sections of bridleways and footways would connect into existing routes to help enhance connectivity east-west and north-south.

12.9.51 Permanent closures without substitute are only proposed in the following circumstances:

- Where the value of the route is not sufficient to justify the re-provision or diversion as part of the proposed scheme (for example a short length of PRow at its terminus).
- Where the proposed scheme and the mitigation proposals divert a route, rendering part of the current route no longer accessible.

12.9.52 All potential diversions and proposed new routes would also be shown on the ProW plans supporting the DCO application, when submitted. That would provide the necessary powers to stop up PRowS and implement diversions and new routes as necessary.

12.9.53 In order to provide mitigation and enhancement as part of the proposed scheme, a number of new routes, reclassification of PRow or new access rights are proposed. These new proposals are detailed in Table 12-21.

12.9.54 Further detail on the assessment of potential effects on WCH is provided in Appendix 12.2 Population and health preliminary impact assessment, Table 1-9. This identified one large adverse effect where a bridleway is to be stopped up and where the user would be subject to longer journey times, and seven moderate adverse effects where footpaths are stopped up and the user is subject to longer journeys, but where journey safety and quality is improved as the user no longer have to cross the A358. The assessment also identifies moderate benefits effects where, although journeys are subject to a diversion, the new journey provides a safer and better quality environment for users.

Table 12-21 Changes to PRow as a result of the proposed scheme

Proposal	Description
Proposed new footpath	New footpath between Nexus 25 roundabout and Henlade with views south to Blackdown Hills.
Proposed new cycle way	New cycleway between Nexus 25 roundabout to West Hatch Lane.
Proposed new footpath	New footpath between existing PRow T 26/4 at Nexus 25 roundabout and existing PRow T22/5.
Proposed new footpath	New section of footway to connect Gravelands Lane to Thorn Lane
Proposed shared use bridleway	New shared use path through Mattock's Tree Green junction and connecting to existing walking and cycling routes.
Proposed new bridleway	Existing A358 road proposed to be retained as a bridleway at Mattock's Tree Green junction.
Proposed new bridleway	New bridleway to provide connection between Greenway Lane to Ash Road.
Proposed new bridleway	Existing road at Ash Cross proposed to be retained as a bridleway.
Enhancement to route	Griffin Lane underbridge providing signed cycle route on the East Deane Way.
Proposed new footpath	New Fivehead River underbridge to accommodate walkers and diversion of footpath through new underbridge.

Proposal	Description
Proposed new bridleway	Proposed new bridleway to connect Village Road and Capland Lane, and existing A358 road to be retained as bridleway.
Proposed new footpath	Footpath diversion through grade separated junction at Ashill.
Proposed new bridleway	New bridleway through the proposed Ding Bridge underpass.
Proposed new footpath	Footpath diversion through new Sunnyside underpass.
Proposed new footway	New footway over Bickenhall overbridge

Walkers, cyclists and horse riders during construction

12.9.55 The following routes would experience effects during construction as they interact with the proposed works:

- East Deane Way (promoted long distance footpath)
- 30 footpaths across the proposed scheme
- nine bridleways across the proposed scheme

12.9.56 Construction effects are likely given the linear nature of the proposed scheme and the construction activities required. For example, noise, dust and temporary diversions could have an impact on users of the existing routes. It is intended to keep the majority of the PRowS open via local management, early re-provision and/or use of short-term and temporary closures.

12.9.57 It has been assumed that pre-commencement condition surveys/inspections would be undertaken on any PRow to be used by construction vehicles. Regular inspections on any installed temporary diversions or alternative routes would also be undertaken with any short-term damage repaired where necessary.

12.9.58 It is therefore anticipated that with the implementation of management and appropriate mitigation there would be slight adverse effects on the majority of WCHs during construction of the proposed scheme, which would not be significant.

12.9.59 For those PRow in the wider study area that do not directly interact with the proposed scheme, there would typically be no or negligible change during construction, leading to neutral effects, which would not be significant.

Walkers, cyclists and horse riders during operation

12.9.60 The proposed scheme includes numerous proposals that seek to improve accessibility and connectivity across the PRow network within the study area. In summary this includes:

- five sections of proposed new footpath
- six sections of proposed new bridleway
- instances of repurposing existing road for walkers and cyclists
- instances where access rights are proposed to provide greater connectivity between the existing PRow

12.9.61 All new structures proposed, as described in detail in Chapter 2 The Project would carry public access rights and/or PRow, providing a key element of mitigation in order to reduce severance for WCH across the study area.

12.9.62 For the purposes of this assessment, the following assumptions have been made in relation to mitigation, management and re-provision:

- Surfaces would be restored/be as per existing post construction. Suitable surfaces for different types and classification of routes would be provided, taking into account relevant guidance, for example from the British Horse Society. For multipurpose routes (e.g. routes providing private means of access and a footpath, bridleway or restricted byway), details of surfaces and access restrictions features (e.g. demountable bollards) would be agreed with the landowner and/or third party responsible for maintenance and/or use of that surface and/or route at the detailed design stage. Such details and specifications for substituted and new PRow, including scale, surface materials, access features and signage would be agreed at detailed design stage between Highways England, its contractor and SWTC.
- Highways England and its contractor would provide appropriate signage for re-provided and new PRow in agreement with SWTC.
- Where the proposed scheme severs local routes, the provision of alternative routes/diversions would ensure that access across the A358 scheme is maintained at key points during operation.

- 12.9.63 New crossing points and new routes are proposed, as well as the repurposing of existing roads for bridleways, both facilitating and allowing improved conditions for WCH.
- 12.9.64 The new underpass at Griffin Lane would provide a safe and connected route for users on the East Deane Way Long Distance Path, including on the Taunton Cycle Trail. The proposed scheme also proposes a new footpath between Nexus 25 roundabout to Henlade to the west of the A358, which would provide a landscaped environment through which walkers would travel with long views south to Blackdown Hills.
- 12.9.65 The proposed scheme proposes to divert several bridleways and PRows across both new grade separated junctions and new underpasses, providing safe and attractive routes. These include at the proposed Stoke Road overbridge, Fivehead River underbridge, High Bridge underbridge, Sunnyside underpass, and the through grade separated junction at Ashill, which would be considered a major magnitude of impact. These diversions would potentially add journey length and time to some users. However, given the improved environment of the route, on balance it is considered that the proposal would bring some benefits to the users, which would be less the significance of the effect.
- 12.9.66 Some PRow routes are to be stopped up including at West Hatch, Bickenhall Lane, Radigan Lane, Venners Water and Thickthorne. However, additional crossings or diversions have been planned which would mitigate the severance of existing footpaths and bridleways. This would provide favourable WCH routes between key residential and employment areas, and between features and facilities within the study area, offering opportunities for recreational and commuter routes.
- 12.9.67 Where routes have to be stopped up, alternative routes to mitigate severance have been planned for. The re-provision is also likely to provide safer routes with a better environmental quality. However, at several points along the proposed scheme, the diversions to existing routes have led to journey time increases of over 500m, which would be considered a major magnitude of impact. When combined with the medium sensitivity, the significance of impact is considered to be a moderate adverse effect, reduced from a large adverse effect as a result of

the betterment and improved safety. This would be significant to users and the local community.

Assessment of effects on human health

- 12.9.68 The assessment of human health considers each of the determinants of human health identified, comprising:
- healthcare services and other community facilities
 - transport and connectivity
 - access to open space and nature
 - air quality
 - noise environment
 - landscape and visual amenity
 - access to employment and training
- 12.9.69 Focusing on each of the determinants in turn, an assessment is made of how, as a result of the proposed scheme, each of these health determinants may be affected and how these may result in changes in health outcomes of the population within the study area. Where relevant, assessment outcomes from other PEI assessments have been used as a basis for the assessment on health.
- 12.9.70 Consideration is given to the sensitivities of the populations within the study area (i.e. for each of the wards). As described in the methodology section, sensitivity is derived from a consideration of population exposure to the impact (how many people are affected) together with the population vulnerability to changes (refer to Table 12-6). Different groups of people within the population would have different vulnerabilities depending on their characteristics (refer to Table 12-17 which sets out the different vulnerabilities of the different groups within the study areas).
- 12.9.71 Health assessments consider how health outcomes of populations within the study area are likely to be affected by a development proposal. Focus is therefore made on local communities rather than visitors to the area, although visitors are considered where appropriate.

Healthcare services and other community facilities

Access to healthcare services and other community facilities during construction

- 12.9.72 Physical access to healthcare services and other community facilities such as schools, nurseries, leisure facilities and community halls, is unlikely to be restricted during construction, although there is likely to be disruption and delays to access caused by construction activities. It is not considered that this disruption would result in any discernible health impacts, although more vulnerable people such as children, older people and those in poor health would be more sensitive to any changes.
- 12.9.73 The existing A358 dual carriageway to the north of the proposed scheme would be retained as it provides access to multiple properties, businesses and the park and ride facility. Access to these facilities therefore would be unaffected.
- 12.9.74 There are likely to be short-term and temporary increased journey times when traffic management measures are required during construction. This could increase driver stress, albeit the health effects are likely to be neutral.

12.9.75 Overall, it is considered that the construction phase of the proposed scheme would result in a neutral health outcome for those within the study area as result of any impacts on health care or other community facilities.

Access to healthcare services and other community facilities during operation

12.9.76 Once the proposed scheme has been completed it is likely that ease of access to healthcare services and other community facilities would be improved due to the reduced amount of travel time/reduced congestion that the A358 would offer. This, therefore, would result in minor positive health effects, particularly for those whose access to such services is more geographically limited to the study area, e.g. children/young people, older people and those in poor health. However, this is unlikely to make a large difference to the local communities which are relatively sparse and not likely to be directly affected by the proposed scheme.

12.9.77 Overall, it is considered that there would be a neutral health outcome within the study area with regards to access to healthcare and other social infrastructure during the operation phase of the proposed scheme.

Transport and connectivity

Transport and connectivity during construction

12.9.78 During the construction phase accessibility to the existing road network and public transport would not be affected significantly. It is not yet known whether any diversions to public transport routes are required, but it is not anticipated that any diversions would affect the overall provision of the service and would not result in any health impacts.

12.9.79 In total the proposed scheme has the potential to affect 39 PRow which are shown on Figure 12.7 Public rights of way within the study area. During construction there would be a number of impacts on these PRow, such as diversions and disruption which would affect options available for leisure activities and, to a certain extent, active travel options.

12.9.80 Highways England intends to keep the majority of PRow open via local management, early re-provision and/or use of short-term, temporary closures. In addition, the draft PRow Management Plan would be prepared detailing how impacts on PRow would be managed during construction.

12.9.81 In all cases, it is likely that realignment or diversion of local routes is proposed, utilising new local roads, overbridges and junctions where possible to maintain access for users. This would enable local communities to maintain access to leisure and active travel options during the construction phase, albeit if inconvenienced for a short period.

12.9.82 Population sensitivity to changes in this health determinant is considered to be low to medium across all wards. Based on the changes to this health determinant, a neutral health outcome is likely to result.

Transport and connectivity during operation

12.9.83 Once the proposed scheme is fully operational, existing routes would remain accessible where possible for the local community and visitors to the area. The proposed scheme would improve journey times thereby improving the perception of connectivity between places.

- 12.9.84 New and safe PRow crossings of the proposed route would be provided through the construction of overbridges and underpasses. Details of these would be explored and presented in the ES.
- 12.9.85 It is considered that the proposed scheme would not increase or decrease the number of active travel journeys, which are for the purpose of commuting. This is because whilst the proposed scheme would improve journey times / experience for motor vehicles, no specific provision is being made for walking or cycling along the proposed A358, therefore not improving the experience and/or safety of cyclist and walkers. There could be a slight increase in people travelling by walking or cycling between places given the improved connections and environment for those trips as a result of the proposed scheme (particularly along the existing northern part of the A358). However, it is not thought that this would result any noticeable health impact.
- 12.9.86 As a result of the proposed scheme, it is not considered that active travel would increase. However, improved connectivity would result from the proposed scheme, as congestion decreases and journey experience improves. It is also likely that local communities would utilise the improved PRow crossings, thereby increasing active travel uptake. For children and young people in particular, this would be beneficial.
- 12.9.87 Population sensitivity to these changes is considered to be low to medium across all wards and based on the predicted change to this health determinant, a beneficial health outcome is likely to result for each of the study wards.

Open space and nature

Open space and nature during construction

- 12.9.88 Access to open space would be maintained throughout construction where possible. However, the quality of that access is likely to be adversely affected due to the proximity of the construction activities (and associated noise and general disturbance). Due to the rural nature of the local area, there are other options for accessing open space in close proximity which could be used during construction and therefore it is considered these changes in access do not represent a large change, particularly as none of the areas under consideration are designated open spaces.
- 12.9.89 Population sensitivity to these changes in access to open space and nature during construction is considered to be low and a neutral health outcome predicted for each of the study wards.

Open space and nature during operation

- 12.9.90 No new areas of open space are being provided. Whilst the proposed scheme does go off-line into a rural area, this is not identified as being open access land or common land.
- 12.9.91 Table 12-21 identifies the PRow that would be affected by the proposed scheme which includes numerous proposals that seek to improve accessibility and connectivity across the PRow network within the study area. In summary this includes:
- five sections of proposed new footpath
 - six sections of proposed new bridleway
 - instances of repurposing existing road for walkers and cyclists

- instances where access rights are proposed to provide greater connectivity between the existing PRow

12.9.92 These works would maintain and enhance access to open spaces and nature, particularly for the communities which live close to these routes and who may use them frequently for local walking. This would be explored more in the ES that would be submitted in support of the DCO application.

12.9.93 Population sensitivity to these changes in access to open space and nature during operation is considered to be low across all wards and based on the predicted change to this health determinant, a neutral health outcome is likely for each of the study wards.

Air quality

Air quality during construction

12.9.94 Chapter 5 Air quality considers effects related to construction dust and construction traffic. During construction, potential air quality effects arise from fugitive dust emissions due to earthworks, track out and general construction activity associated with the proposed scheme. During these activities the contractor would be following the EMP, which when prepared and submitted as part of the DCO application, would set out how environmental impacts should be mitigated during construction.

12.9.95 Whilst the proposed scheme is considered to have high potential for generation of construction dust, with the implementation of these mitigation measures, the air quality assessment (Chapter 5 Air quality) considers impacts on human health to be not significant (negligible). That assessment however does not consider the potential vulnerabilities within a population that may make them more susceptible to changes in air quality. Ruishton and Creech ward has a high vulnerability with regards to people in poor health, whilst West Monkton and Taunton Halcon have high vulnerability with regards to children and young people. All other wards have either a high or medium vulnerability with regards to older people. All wards are therefore considered to be of high sensitivity to changes in this health determinant and there is potential for a negative health outcome in the absence of mitigation. Because mitigation would be in place, there would be a neutral health outcome in relation to air quality during construction.

12.9.96 Construction traffic is not considered to pose a risk to human health in any of the study wards.

Air quality during operation

12.9.97 Chapter 5 Air quality has predicted no exceedances of the Air Quality Objectives (AQOs) at human receptors for the proposed scheme. All concentrations of annual mean NO₂ are predicted to remain below the AQOs.

12.9.98 At the Henlade AQMA, the concentrations of annual mean NO₂ reduce from 33.1 µg/m³ (micrograms per cubic metre) to 12.4 µg/m³ in 2023. This is due to the proposed scheme moving traffic away from receptor locations in the AQMA and a reduction in congestion.

12.9.99 With no exceedances of the AQOs at human receptor locations and improvements in the Henlade AQMA, it is considered the proposed scheme would have no significant effects on air quality. Overall, the proposed scheme is

considered to have a beneficial impact on local air quality due to the reductions in NO₂ concentrations within the AQMA.

12.9.100 The population is considered to have high to medium vulnerability to air quality across all wards as a result of the proportion of children, young people, older people and people with poor health who are more vulnerable to changes in air quality. Population sensitivity is therefore medium to high. Combined with the air quality assessment outcome, this is likely to result in health outcomes that are positive.

Noise

Noise during construction

12.9.101 Chapter 11 Noise and vibration assesses the construction noise levels. The results of the noise impact assessment are shown in Table 12-22 showing impacts related to individual locations (including structures, earthworks and cuttings associated with individual proposed scheme elements) and the total combined impacts including other linear works away from specific structures (note some properties would be impacted by multiple activities).

Table 12-22 Construction noise impacts at all receptors (residential and non-residential)

Location	Properties predicted to experience a major noise impact	Properties predicted to experience a moderate noise impact	Total
Ashill junction	3	3	6
Griffin Lane underbridge	1	1	2
Stewley Link Road	2	2	4
Mattock's Tree Green junction	18	6	24
New Cad Brook underbridge	0	4	4
Stoke Road overbridge	131	82	213
Hatch Beauchamp junction overbridge	1	0	1
New High bridge underbridge	3	0	3
Venner's bridge (watercourse)	5	0	5
Total impacts for all works*	199	146	345

* Includes earthworks, cuttings and sub-base activities not specific to a particular junction or structure.

12.9.102 In summary, based on the preliminary assessment, a total of 199 properties are predicted to experience major adverse impacts during one or more construction activities and 146 properties are predicted to experience moderate adverse impacts. It is likely that durations of these works would exceed ten days in 15 consecutive days or 40 days in a consecutive six months and therefore temporary direct significant adverse effects are predicted at these receptors.

12.9.103 The above impacts all relate to noise levels predicted to exceed the Significant Observed Adverse Effect Level (SOAEL) threshold. There may be further negligible or minor impacts affecting properties between the Lower Observed Adverse Effect Level (LOAEL) and SOAEL.

12.9.104 Within each of the study wards the population is considered to be between low and medium sensitivity to changes in noise levels. This is based on consideration

of the population vulnerability within the wards, particularly in relation to children, older people and people with poor health who are more sensitive to noise. As it is not possible to know who lives within the residential properties affected, or indeed whether these residents are particularly vulnerable to changes in noise, a general assumption is made based on the average within the wards. Assuming that the 345 properties have residents who are particularly sensitive to changes in noise levels (as a worst case), this represents an adverse health outcome at these locations. However, at a population level, construction noise is unlikely to result in adverse health outcomes in each of the wards.

Noise during operation

12.9.105 Chapter 11 Noise and vibration assesses the operational noise levels at residential receptors along the proposed scheme.

12.9.106 The noise assessment summarises the overall noise impacts separately for settlements around the proposed scheme, north to south. These are listed below in Table 12-23 along with an overview of which ward these fall within and what the outcomes of the noise assessment are in terms of the number of residential properties affected either positively or negatively.

Table 12-23 Noise effects (as reported in Chapter 11 Noise and vibration)

Section as identified in noise assessment	Ward	Significant Adverse above the SOAEL	Significant Beneficial above the SOAEL	Number of dwellings			
				Significant Adverse (between LOAEL and SOAEL)	Significant Beneficial (between LOAEL and SOAEL)	Not Significant	Negligible effects above SOAEL
Taunton	West Monkton Taunton Halcon Taunton and Blackbrook and Holway	-	-	-	-	1,007	17
Ruishton	Ruishton and Creech	-	-	-	1	405	-
Henlade	North Curry and Stoke St Gregory	2	55	108	37	47	-
Thornfalcon and Mattock's Tree Green Junction	Ruishton Neroche, Taunton Deane	5	7	42	5	57	-
West Hatch and Meare Green	Neroche, Taunton Deane	-	-	22	-	13	-
Hatch Beauchamp	Neroche, Taunton Deane	-	-	55	-	171	-

Section as identified in noise assessment	Ward	Significant Adverse above the SOAEL	Significant Beneficial above the SOAEL	Significant Adverse (between LOAEL and SOAEL)	Significant Beneficial (between LOAEL and SOAEL)	Not Significant	Negligible effects above SOAEL
		Number of dwellings					
Hatch Green	Neroche, Taunton Deane	2	1	21	3	6	-
Ashill	Neroche, South Somerset	11	1	115	2	14	-
Rapps	Neroche, South Somerset Islemoor	-	-	32	-	40	-
Horton Cross	Neroch, South Somerset Ilminster Islemoor	5	-	14	-	137	1

12.9.107 In the wider area where the current traffic patterns would be influenced indirectly due to the opening of the proposed scheme, dwellings located within 50m from the road edges would be subject to a reduction in noise levels on following roads:

- Shoreditch Road, B3170, and Chestnut Drive in Taunton
- Thurlbear Road in Orchard Portman
- Staple Hill and New Road in Staple Fitzpaine
- Unnamed roads between Staple Fitzpaine and Buckland St Mary
- Pound Road in Horton

12.9.108 Dwellings located on the following road would be subject to an increase in noise levels:

- Windmill Hill and Stoke Road in North Curry
- Meare Green in Mare Green
- Curload Road in Curload
- Stanmoor Road in Burrow Bridge
- Headwell and Higher Street in Curry Mallet
- Broadway Road in Broadway
- Hanning Road in Horton

12.9.109 Within each of the study wards the population is considered to be between low and medium sensitivity to changes in noise levels. This is based on consideration of the population vulnerability within the wards, particularly in relation to children, older people and people with poor health who are more sensitive to noise. As it is not possible to know who lives within the residential properties affected, or indeed whether these residents are particularly vulnerable to changes in noise, a general assumption is made based on the average within the wards.

12.9.110 Overall, there are relatively few residential properties that would experience a significant beneficial noise effect as a result of the proposed scheme. The highest number of residential properties to benefit are within North Curry and Stoke St Gregory ward. Due to the relatively low number of properties likely to experience this (in terms of population exposure), the population sensitivity is considered to be low with a positive health outcome.

12.9.111 With regards to the significant adverse effects identified by the noise assessment, more properties are affected (compared to experiencing beneficial effects), although the total number still remains relatively small compared to all properties within the wards. There are groups within each of the wards that are particularly sensitive to noise increases, including children, older people and people with poor health and the population sensitivity within each of the wards is, as described above, between low and medium. The health outcome would be negative for those residents affected. At a population level, the health outcome is likely to be neutral across all wards except for North Curry and Stoke St Gregory, which is positive.

Landscape and visual amenity

Landscape and visual amenity during construction

12.9.112 Chapter 7 Landscape identifies the sources of effects on landscape and visual receptors during construction as:

- Temporary construction compounds with associated lighting and fencing
- Temporary haul roads
- Stockpiling and storage of materials
- Excavation and handling of materials
- On- and off-site construction traffic
- On-site plant, such as:
 - Demolition plant and excavators for site clearance.
 - Articulated dump trucks, excavators up to 35 tonne capacity, dozers and rollers for bulk earthworks.
 - Cranes, telescopic boom lifts, piling rigs and telescopic forklifts for construction of structures.
- Night-time security lighting year-round such as:
 - Isolated task lighting, which would be provided intermittently where required during the winter months only.
 - Lighting of construction site compounds.

12.9.113 The majority of construction activities would take place between 2024 and 2028 and is considered to be temporary. The construction period is likely to impact on the sense of tranquillity and calm in the existing landscape and the construction activities themselves would result in changes to the existing landscape.

12.9.114 The following landscape construction impacts are identified in Chapter 7 Landscape for each of the local landscape character areas (LLCA) within the study area:

- Vale of Taunton Deane LLCA (assessed as being of medium sensitivity for the purpose of the LVIA) – major adverse magnitude of change due to large-scale impact to existing landscape character including fields, the village of Henlade

and settlements between the existing A358 and new offline section, caused by construction works and associated vehicles and deliveries. This is assessed to result in a large adverse effect, which is significant.

- North Curry Sandstone Ridge LLCA (assessed as being of medium sensitivity for the purpose of the LVIA) – This is assessed to be a major adverse magnitude of change, based on the loss and extensive damage to existing landscape character of Mattock’s Tree Hill, an asset of local cultural value, and nearby settlements, caused by construction works and associated vehicles and deliveries. This is assessed to result in a large adverse effect, which is significant.
- Fivehead Vale LLCA (assessed as being of medium sensitivity for the purpose of the LVIA) – This is assessed to result in a moderate adverse magnitude of change due to works associated with the construction of new uncharacteristic road infrastructure. The magnitude of impact is considerable on the character of connectivity within the landscape, stopping up local lanes, and shifting movement from lanes and footpaths to overbridges and footbridges. This is assessed to result in a moderate adverse effect, which is significant.
- Lower Lias Foothills and Lowland LLCA (assessed as being of medium sensitivity for the purpose of the LVIA) – This is assessed to result in a moderate adverse magnitude of change due to the impact of constructing two areas of new uncharacteristic road infrastructure, as well as on the character of connectivity within the landscape, stopping up local lanes and diverting footpaths. This is assessed to result in a moderate adverse effect, which is significant.

12.9.115 Chapter 7 Landscape and Figure 7.4 Zone of Theoretical Visibility (ZTV) and Proposed Viewpoints identifies a number of viewpoint locations which have been assessed for construction impacts. Out of the 48 viewpoints (VP) assessed, 25 are identified as being significantly affected (i.e. of moderate significance and above):

- Major adverse significant effect: VP27: Hedgerow and woodland removal adjacent to both sides of existing A358 would create exposed views of the road construction and associated Ashill overbridge and new link to Rapps.
- Very large adverse significant effect: VPs 1 and 4: Effect would result from changes in view from rural fields to close proximity views of construction machinery.
- Large adverse significant effect: VPs 2, 5, 7, 10, 13, 18, 22, 24, 26, 32: generally relates to loss of hedgerow and trees making construction works visible.
- Moderate adverse significant effect: VPs 6, 9, 14, 16, 19, 20, 21, 23, 25, 30, 31, 46: generally related to removal of hedgerow and trees in the distance, exposing more construction activity from viewpoints.

12.9.116 From a health perspective, changes to the landscape and visual amenity during construction are considered to result in neutral health outcomes due to the temporary nature of loss of amenity and the low sensitivity of the communities to changes in landscape and visual determinants of health.

Landscape and visual amenity during operation

12.9.117 Chapter 7 Landscape identifies the sources of effects on landscape during operation as:

- Tree and vegetation loss when compared to baseline (particularly at year 1, as any mitigation planting would be immature).
- Additional woodland planting incorporated into the proposed scheme to reduce visual impacts and improve landscape integration of the proposed scheme.
- Presence of the widened A358 corridor and increased prominence in the landscape along the on-line section of the proposed scheme.
- The presence of the A358 corridor in new landscapes that did not previously have road infrastructure along the off-line section of the proposed scheme.
- The extent, scale, and design of earthworks.
- The materials and appearance of proposed structures for the works (e.g. junctions, bridges, and retaining walls).
- Addition or removal of lighting along the A358 corridor.
- Addition of road signage along the A358 corridor.
- Any changes to the existing strategic green infrastructure network.

12.9.118 Impacts on visual amenity are identified as:

- Tree and vegetation loss when compared to baseline increasing visibility of the A358 (particularly at year 1, as any mitigation planting would be immature).
- Presence of widened A358 corridor and increased prominence of traffic in views.
- Presence of the A358 corridor and associated traffic in some views that did not previously have road infrastructure along the on-line section, causing dust and visual intrusion.
- The extent, scale, and design of earthworks.
- The materials and appearance of proposed structures for the works (e.g. junctions, bridges, and retaining walls).
- Addition or removal of lighting along the A358 corridor.
- Addition of road signage along the A358 corridor.
- Engineering or environmental features enclosing or changing views towards the Blackdown Hills AONB or other landscape features.
- Establishment of visual mitigation (particularly at year 15).
- Establishment of landscape mitigation (particularly at year 15).

12.9.119 The following landscape operational impacts are identified in Chapter 7

Landscape for each of the local landscape character areas (LLCA) within the study area. Only year 15 is considered for the purpose of the health assessment because it is considered unlikely that health outcomes would be affected 1 year post construction:

- Vale of Taunton Deane LLCA – A moderate adverse magnitude of change due to mitigation treatments helping to reinstate some lost features and partially embed new infrastructure into local landscape character. Damage to existing landscape character and the increase in aural and visual influence of transport features on the landscape would therefore be lessened. This is assessed to result in a moderate adverse effect, which is significant.
- North Curry Sandstone Ridge LLCA – At year 15 this is assessed to be a major adverse magnitude of change, based on the loss of the existing landscape character of Mattock's Tree Hill, an asset of local cultural value. The impact on settlements may be reduced by the establishment of mitigation

planting to help re-establish the character in these areas of notable change. This is assessed to result in a moderate adverse effect, which is significant.

- Fivehead Vale LLCA – At year 15 the magnitude of change is assessed to reduce to minor adverse with mitigation treatments helping to reinstate some lost features and partially embed new infrastructure into local landscape character and reducing the overall increase in influence of transport features on the landscape. This is assessed to result in a slight adverse effect, which is not significant.
- Lower Lias Foothills and Lowland LLCA – At year 15 the magnitude of change is assessed to be minor adverse. Although landscape mitigation measures would reinstate many of the baseline characteristics of the landscape, the widened corridor and addition of two areas of new uncharacteristic road infrastructure for proposed overbridges would continue to increase the influence of transport infrastructure on landscape character in this area, as well as the character of connectivity within the landscape, stopping up local lanes and shifting movement from lanes and footpaths, to overbridges. This is assessed to result in a slight adverse effect, which is not significant.

12.9.120 Chapter 7 Landscape and Figure 7.4 ZTV and Proposed Viewpoints identifies a number of viewpoint locations which have been assessed for operational impacts. For the same reasons as given for landscape, out of the 48 viewpoints assessed, only 4 are identified as being significant (i.e. of moderate significance and above)

- Large adverse significant effect: VPs 1, 4: due to a change in views from rural fields to close proximity views of major highway corridor. Established mitigation would soften appearance of the proposed scheme.
- Moderate adverse significant effect: VPs 18, 32: at VP18 the highway corridor and access road to Stewley Link Road would be a more prominent feature of the view than the baseline condition. At VP32 the loss of mature trees would not be fully mitigated and the prominence of the highway corridor would be increased due to the closer proximity and presence of planted earthworks for Stewley Link Road.

12.9.121 From a health perspective, changes to the landscape and visual amenity during operation are considered to result in neutral health outcomes at a population level within each of the study wards due to the low sensitivity of the communities to changes in landscape and visual determinants of health.

Sources of pollution

Pollution during construction

12.9.122 Chapter 9 Geology and soils identifies localised significant effects in relation to exposure to contaminated soil, groundwater, leachate, ground gas and vapours, which but concludes that with appropriate and standard mitigation in place, there would not be any significant risk. From a health perspective there would also therefore be a neutral health outcome from sources of pollution which would be controlled during this time.

Pollution during operation

12.9.123 Provided that the mitigation measures set out in Chapter 9 Geology and soils are followed, population health outcomes are unlikely to be affected as a result during the operational phase, i.e. a neutral health outcome is predicted.

Employment and training

Access to employment and training during construction

- 12.9.124 During construction it is anticipated that employment would be generated that would remain fairly constant over the construction programme. Given the location of the proposed scheme, it is anticipated that a proportion of the construction workforce would be brought into the area and therefore made up of workers travelling from outside the area and staying locally.
- 12.9.125 Given that the majority of the workforce would be from outside of the local area, the health benefits associated with employment would be dissipated beyond the local communities. However, in addition to the direct employment there would also likely be some induced employment within the tourism sector which is likely to provide some of the accommodation needed to house the workforce which would be travelling into the area for the work.
- 12.9.126 New spend within the local economy by these workers is also likely to benefit local businesses. This is likely to be relatively small when compared to the overall tourism spend in Somerset, but nonetheless is not an insignificant level of spend in the local area, with an increased boost to the local economy.
- 12.9.127 For those who are unemployed or economically inactive, there may be opportunities for accessing training related to construction employment. At this stage it is not known how many people would benefit and therefore it is not possible to quantify the magnitude of this effect.
- 12.9.128 Whilst there would be some employment benefits in the local area as a result of induced spend, it is considered that the overall construction phase health outcomes within a community of low sensitivity to this change, would be short-term and neutral. This is based on the wide area across which direct employment benefits are likely to be felt and the relatively low levels of induced employment likely to result from the proposed scheme's construction phase.

Access to employment and training during operation

- 12.9.129 During operation the proposed scheme would not result in any direct employment benefits beyond typical maintenance arrangements. However, as identified in PEI Report Chapter 2: The Project (Table 2-1), one of the proposed scheme objectives is to facilitate growth in employment at key locations and centres along the A303/A358/A30 corridor and to the South-West Region'.
- 12.9.130 Whilst it is difficult to measure the success of these objectives, if (when) met, they would all contribute to a stronger employment market that would benefit the health of the whole community. As such, it is predicted that the proposed scheme would result in long-term, positive health outcomes, even within a study population of low sensitivity to economic change.

12.10 Monitoring

- 12.10.1 Beyond the recommendations for monitoring made in other relevant assessments, there are no significant adverse effects related to this assessment identified either during the construction or operational stages of the proposed scheme that would require monitoring.

12.11 Summary

12.11.1 The summary is split between the community lands and assets assessment and the human health assessment.

Community lands and assets

Preliminary construction assessment

12.11.2 There are three private properties that experience permanent large adverse effects during construction due to demolition.

12.11.3 There are no demolitions resulting in large adverse effects for either community assets or businesses. There are moderate adverse effects to 20 businesses as a result of access changes or discernible changes in environmental quality.

12.11.4 37 agricultural land holdings would be affected temporarily during construction, of which 23 would experience very large, large or moderate temporary adverse effects, which are significant.

12.11.5 Once the construction is complete and agricultural land required temporarily has been restored, 31 agricultural land holdings would be affected permanently from construction, of which 16 would experience large or moderate permanent adverse effects, which are significant.

12.11.6 Slight adverse effects would be experienced by all walker, cyclists, and horse riders as a result of construction activities, which are not considered significant.

Preliminary operational assessment

12.11.7 Table 12-24 summarises the overall assessment of significance of identified effects for the topics discussed in this section.

12.11.8 Four private properties are anticipated to experience permanent moderate adverse effects during operation where severance has been created or there are substantial environmental changes. There are no demolitions resulting in permanent large adverse effects for either community assets or businesses. There is one very large adverse effect, one large adverse effect and four moderate adverse effects however because of stopped up road or discernible changes in the attributes of the environmental quality. Both community assets and business however would experience slight beneficial effects once the proposed scheme is operational.

Table 12-24 Summary of significance during construction and operation – land use and accessibility

Land use and accessibility category	Significance of effect during construction	Significance of effect during operation
Private property and housing	<p>Permanent large adverse</p> <ul style="list-style-type: none"> Henlade Farm Bath Cottage, West Hatch <p>Permanent large adverse</p> <ul style="list-style-type: none"> Meadow View <p>Temporary moderate adverse</p> <ul style="list-style-type: none"> Keirles, Thornfalcon Ash Cross Cottage 	<p>Permanent moderate adverse</p> <ul style="list-style-type: none"> Kierles, Thornfalcon <p>Permanent moderate adverse</p> <ul style="list-style-type: none"> Ash Cross Cottage, Ash Road <p>Permanent moderate adverse</p> <ul style="list-style-type: none"> Little Ashe <p>Permanent moderate adverse</p> <ul style="list-style-type: none"> April Cottage

Land use and accessibility category	Significance of effect during construction	Significance of effect during operation
	<ul style="list-style-type: none"> • Little Ashe, Ash Road • Chase Cottage, West Hatch • April Cottage Rapps Temporary slight adverse <ul style="list-style-type: none"> • Land Plat, Stewley 	Permanent slight adverse <ul style="list-style-type: none"> • Chase Cottage Permanent slight adverse <ul style="list-style-type: none"> • Land Plat, Stewley
Community land and assets	Permanent very large adverse <ul style="list-style-type: none"> • Somerset Progressive School Temporary large adverse <ul style="list-style-type: none"> • Huish Woods Scout Campsite Temporary moderate adverse <ul style="list-style-type: none"> • Ivy House Social Club Temporary moderate adverse <ul style="list-style-type: none"> • West Hatch Village Hall Temporary moderate adverse <ul style="list-style-type: none"> • Ashill Village Hall Temporary moderate adverse <ul style="list-style-type: none"> • Ashill Primary School Temporary slight adverse <ul style="list-style-type: none"> • all other receptors 	Permanent Slight Beneficial – <ul style="list-style-type: none"> • all receptors
Development land and businesses	Permanent moderate adverse <ul style="list-style-type: none"> • Nags Head Tavern. Temporary moderate adverse <ul style="list-style-type: none"> • Nexus 25 roundabout • Ivy House Park • The Mount Somerset • Thornfalcon Classic Car Storage • Desert to Jungle Gardening • Somerset Motorhome • SPAR Thornfalcon • KNR Scaffolding • Posh Wash Showers Ltd • Thornfalcon Storage • Baxters Rescue • AVS Furniture Outlet • Ashe Farm Camping and Caravan Site • Foresters Garden Buildings, Vape it UK, Oatmans • TM Safety Signs Ltd, West Hatch Lane Equestrian • Orchard Poultry • Jordan's Estate Glamping • Blackdown Shepherds Huts • JM Glass Ltd • Ginger Bread House • Southfields roundabout employment allocation 	Permanent Slight Beneficial – <ul style="list-style-type: none"> • all receptors

Land use and accessibility category	Significance of effect during construction	Significance of effect during operation
	<ul style="list-style-type: none"> • Stoneleigh Beauty Temporary slight adverse <ul style="list-style-type: none"> • All other receptors 	
Agricultural land holdings	Temporary very large adverse <ul style="list-style-type: none"> • Ashe Farm Temporary large adverse <ul style="list-style-type: none"> • Land north of Haydon Lane • Haydon House Farm • The Conifers • Rose Farm • West Hatch Farm/Meare Court Farm • Broughton Farm • Broadlands Farm • Bickenhall Farm/Higher Wrantage Farm (including Gore Langton Estate) • Capland Orchard • Westview Farm • Sunnyside Farm • Ashill Farm • Southtown Farm House Temporary moderate adverse <ul style="list-style-type: none"> • Thornwater Farm • The Clock House (Land at Home Farm) • Ash Lodge • Land North of West Hatch Lane • Forest Farm • Meadows • New Rydon Farm • Land north of Ashill • Shrubbery Farm Temporary slight and neutral adverse <ul style="list-style-type: none"> • All other receptors Permanent large adverse <ul style="list-style-type: none"> • Land north of Haydon Lane • Haydon House Farm • The Conifers • Rose Farm • Ashe Farm • West Hatch Farm/Meare Court Farm • Broughton Farm • Sunnyside Farm Permanent moderate adverse <ul style="list-style-type: none"> • Thornwater Farm 	N/A - All effects experienced during construction phase.

Land use and accessibility category	Significance of effect during construction	Significance of effect during operation
	<ul style="list-style-type: none"> • Ash Lodge • Land North of West Hatch Lane • Bickenhall Farm/Higher Wrantage Farm (including Gore Langton Estate) • Forest Farm • Meadows • Ashill Farm • Shrubbery Farm • Southtown Farm House <p>Permanent slight and neutral adverse</p> <ul style="list-style-type: none"> • All other receptors 	
WCH	<p>Slight adverse</p> <ul style="list-style-type: none"> • All WCH routes 	<p>Large adverse</p> <ul style="list-style-type: none"> • T31/36 Bridleway <p>Moderate adverse</p> <ul style="list-style-type: none"> • T22/6 Footpath linking Taunton and Henlade • T22/7 Footpath linking Ruishton to Henlade, north-south • T22/5 Footpath linking Henlade towards Ruishton, south-north • T22/1 Footpath links Henlade and Thornfalcon • T31 /37 Footpath Mattock Tree • T2/5 Footpath • T14.8 Bridleway • CH 1/1 Footpath linking Radigan Lan to Ashill • CH 1 / 2 Footpath links Radigan Lane to Ashill • CH 1 /3 Footpath linking Venner's Water • CH 1/5 Links Park Barn Lane to the A358 • CH 1/6 Footpath Ashill • CH1 /21 Footpath links to Thickthorne across the A358 • CH 1/ 6 Footpath crosses the A358 and links to Suggs Lane • Ch 2/15 Footpath Ding Bridge <p>Slight adverse</p> <ul style="list-style-type: none"> • T27/3 links the railway cutting to the A358, south-north

Land use and accessibility category	Significance of effect during construction	Significance of effect during operation
		<ul style="list-style-type: none"> T14/15 Footpath crossing the A358 at Capland, east-west T14/4 footpath links the A358 with Forest Drove, east-west

Human health assessment

12.11.9 Table 12-25 below set out a summary of health outcomes for each of the wards within the study area, taking each health determinant in turn for the construction and operation stages of the proposed scheme.

Table 12-25 Summary assessment of human health outcomes

Ward	Sensitivity	Health outcome: Construction	Health outcome: Operation
Transport and connectivity			
West Monkton	Low	Neutral	Positive
Taunton Halcon	Low	Neutral	Positive
Taunton and Blackbrook and Holway	Low	Neutral	Positive
Neroche, Taunton Deane	Medium	Neutral	Positive
North Curry and Stoke St Gregory	Low	Neutral	Positive
Ruishton and Creech	Medium	Neutral	Positive
Ilminster	Low	Neutral	Positive
Islemoor	Low	Neutral	Positive
Neroche, South Somerset	Medium	Neutral	Positive
Open space and nature			
West Monkton	Low	Neutral	Neutral
Taunton Halcon	Low	Neutral	Neutral
Taunton and Blackbrook and Holway	Low	Neutral	Neutral
Neroche, Taunton Deane	Low	Neutral	Neutral
North Curry and Stoke St Gregory	Low	Neutral	Neutral
Ruishton and Creech	Low	Neutral	Neutral
Ilminster	Low	Neutral	Neutral
Islemoor	Low	Neutral	Neutral
Neroche, South Somerset	Low	Neutral	Neutral
Air quality			
West Monkton	Low	Negative	Positive
Taunton Halcon	Low	Negative	Positive
Taunton and Blackbrook and Holway	Low	Negative	Positive
Neroche, Taunton Deane	Medium	Negative	Positive
North Curry and Stoke St Gregory	Low	Negative	Positive
Ruishton and Creech	Medium	Negative	Positive
Ilminster	Low	Negative	Positive

Islemoor	Low	Negative	Positive
Neroche, South Somerset	Medium	Negative	Positive
Noise and vibration			
West Monkton	Low	Neutral	Neutral
Taunton Halcon	Low	Neutral	Neutral
Taunton and Blackbrook and Holway	Low	Neutral	Neutral
Neroche, Taunton Deane	Medium	Neutral	Neutral
North Curry and Stoke St Gregory	Low	Neutral	Positive
Ruishton and Creech	Medium	Neutral	Neutral
Ilminster	Low	Neutral	Neutral
Islemoor	Low	Neutral	Neutral
Neroche, South Somerset	Medium	Neutral	Neutral
Landscape			
West Monkton	Low	Neutral	Neutral
Taunton Halcon	Low	Neutral	Neutral
Taunton and Blackbrook and Holway	Low	Neutral	Neutral
Neroche, Taunton Deane	Low	Neutral	Neutral
North Curry and Stoke St Gregory	Low	Neutral	Neutral
Ruishton and Creech	Low	Neutral	Neutral
Ilminster	Low	Neutral	Neutral
Islemoor	Low	Neutral	Neutral
Neroche, South Somerset	Low	Neutral	Neutral
Sources of pollution			
West Monkton	Low	Neutral	Neutral
Taunton Halcon	Low	Neutral	Neutral
Taunton and Blackbrook and Holway	Low	Neutral	Neutral
Neroche, Taunton Deane	Low	Neutral	Neutral
North Curry and Stoke St Gregory	Low	Neutral	Neutral
Ruishton and Creech	Low	Neutral	Neutral
Ilminster	Low	Neutral	Neutral
Islemoor	Low	Neutral	Neutral
Neroche, South Somerset	Low	Neutral	Neutral
Employment and training			
West Monkton	Low	Neutral	Positive
Taunton Halcon	Low	Neutral	Positive
Taunton and Blackbrook and Holway	Low	Neutral	Positive
Neroche, Taunton Deane	Low	Neutral	Positive
North Curry and Stoke St Gregory	Low	Neutral	Positive
Ruishton and Creech	Low	Neutral	Positive
Ilminster	Low	Neutral	Positive
Islemoor	Low	Neutral	Positive
Neroche, South Somerset	Low	Neutral	Positive

Further work

- 12.11.10 Quantified effects on agricultural land would be updated and provided to reflect any changes made to the DCO boundary.
- 12.11.11 Lengths of stopping up, diversions and new sections of PRow would be calculated and provided in the ES once the PRow Management Plan is available.
- 12.11.12 The impacts on health determinants would be updated and provided to reflect any changes to the results reported in other relevant assessments.

Abbreviations List

Please refer to PEI Report Chapter 17 Abbreviations.

Glossary

Please refer to PEI Report Chapter 18 Glossary.

References

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