

A30 Chiverton to Carland Cross Environmental Statement

**Volume 6 Document Ref 6.4 ES Appendix 12.1
Health impact assessment**

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Planning Act 2008
Infrastructure Planning (Applications: Prescribed Forms and Procedure)
Regulations 2009 (as amended)
APFP Regulation 5(2)(a)

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12 Health

12.1 Introduction

12.1.1 A development project may result in impacts that have consequences for the health of a population. A health assessment is therefore a means of assessing these health consequences and to use this information to feed back into the project design in order to maximise the associated positive and minimise the negative health impacts of the proposal.

12.1.2 Health assessments are multidisciplinary and cut across the traditional boundaries of health, public health, social sciences and environmental sciences. The most commonly used definition of a health assessment is taken from the World Health Organisation (WHO) Gothenburg Consensus Paper:

'.....a combination of procedures, methods and tools by which a policy, programme or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population'

12.1.3 The broader understanding of health is captured by the WHO definition:

'Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity'.

12.1.4 With this in mind, the objectives of this assessment are to:

- identify any negative or positive population health effects of the scheme during construction and operation on existing residents living close to the scheme;
- develop mitigation and enhancement measures that can be applied to the scheme (to be applied following planning consent and during scheme delivery) in order to minimise the negative and enhance the positive health effects; and
- identify possible indicators for monitoring and evaluating the actual health effects during construction and operation.

12.1.5 The following sections set out how the assessment has been carried out, the results of the assessment and recommendations for improving the health effects of the scheme.

12.2 Competent Expert

12.2.1 This health assessment has been prepared by Rowena Ekermawi who is a Chartered Environmentalist with 16 years of experience in Environmental Impact Assessment and Health Assessment. Her qualifications include a BSc in Environmental Biology (University of Reading) and MSc in Environmental Assessment and Management (Oxford Brookes University). She is currently working towards a Master of Public Health qualification.

12.3 Policy Context and Guidance

12.3.1 This section summarises the policy context in relation to the scheme. It does not repeat those that are related to specific EIA topic assessments (e.g. air quality, noise), but rather focuses on those that are related to overall health and wellbeing. An overview of relevant guidance is also set out to identify which guidance has been applied for this assessment.

Policy

National Policy Statement for National Networks, DfT, 2014

- 12.3.2 The National Policy Statement for National Networks (NPS) forms part of the planning system established under the 2008 Planning Act to address Nationally Significant Infrastructure Projects (NSIPs). It sets out the need for, and Government's policy to deliver, development of NSIPs on the national road and rail networks in England.
- 12.3.3 The NPS states that roads have the potential to affect the health, wellbeing and quality of life of the population. Direct health effects are recognised in relation to traffic, noise, vibration, air quality and emissions, light pollution, community severance, dust, odour, polluting water, hazardous waste and pests. Indirect effects are identified as potentially resulting from changes to access to key public services, local transport, opportunities for cycling and walking or the use of open space for recreation and physical activity.
- 12.3.4 The NPS states that the applicant (in this case Highways England) of a road scheme should identify measures to avoid, reduce or compensate for adverse health impacts as appropriate and the assessment should consider cumulative impacts on health that arise as a result of different impacts affecting people simultaneously.

The Cornwall Local Plan Strategic Policies 2010-2030 (adopted 2016)

- 12.3.5 Policy 17 Health and Wellbeing of the Local Plan aims to improve the health and wellbeing of Cornwall's communities, residents, workers and visitors. Development should:
- Protect, and alleviate risk to, people and the environment from unsafe, unhealthy and polluted environments by avoiding or mitigating against harmful impacts and health risks such as air and noise pollution and water and land contamination and potential hazards afforded from future climate change impacts;
 - Maximise the opportunity for physical activity through the use of open space, indoor and outdoor sports and leisure facilities and providing or enhancing active travel networks that support and encourage walking, riding and cycling; and
 - Provide flexible community open spaces that can be adapted to the health needs of the community and encourage social interaction.

Cornwall Partnership NHS, Summary Strategic Plan, 2014-2019

- 12.3.6 This is a five-year strategic plan (2014-2019) which sets out the long term service provision in the County. The strategy recognises that the population in Cornwall is getting older and that future service provision needs to adapt to allow for these changes. The strategy also recognises that tackling deprivation and child poverty need to be given high priority. One of the main aims of the strategy is to improve health and wellbeing within all communities.

Cornwall and Isle of Scilly – Sustainability and Transformation plan

- 12.3.7 Sustainability and Transformation plans are place-based, multi-year plans built around the needs of local populations with the aim of driving sustainable

transformation of health and care outcomes between 2016 and 2021. The plan for Cornwall is not yet complete, but based on consultation to date the main aims are:

- To prevent ill health;
- More joined up care in community; and
- Better access to GP services and urgent care services in the evenings and on weekends

Relevant guidance

12.3.8 There is no statutory guidance for assessing the wider effects of projects on communities or population health. There are, however, some well-established 'toolkits' and guides available for health impact assessment (HIA), including:

- Institute of Environmental Management and Assessment, 2017: Health in Environmental Assessment, a primer for a proportionate approach;
- NHS London Healthy Urban Development Unit (HUDU), 2015. Healthy Urban Planning Checklist and Rapid Health Impact Assessment Tool;
- Wales HIA Support Unit (WHIASU); HIA, A Practical Guide;
- National Mental Wellbeing Impact Assessment Development Unit 2011: Mental Wellbeing Impact Assessment Toolkit; and
- Health Scotland et al, 2007: Health Impact Assessment for Transport: A Guide.
- Ben Cave Associates, (2009); A review package for Health Impact Assessment reports of development projects.

12.4 Scoping

12.4.1 The scope of the Environmental Assessment was set out in the Scoping Report that was submitted in August 2017. This included consideration of population and health as required by the EIA Regulations 2017. The Scoping Report did not propose to include population and human health as a standalone assessment, but rather to include consideration of effects in other relevant topic chapters such as noise and air quality.

12.4.2 As a result of consultation, Public Health England (PHE) provided a scoping response in August 2017 to the Planning Inspectorate for inclusion in the formal response to the scoping request which requested that a health impact section [assessment] should summarise key information, risk assessments, proposed mitigation measures, conclusions and residual impacts, relating to human health. PHE emphasised that there should be compliance with the requirements of National Policy Statements for England (NPSE) and relevant guidance and standards should also be highlighted (see Volume 6 Document Ref 6.4 ES Appendix 4.2 Responses to scoping opinion).

12.4.3 The existing DMRB guidelines do not take population and health into account as required by the 2017 EIA Regulations. However, in order to respond to PHE's scoping response and to bring the assessment into line with current standards, a health assessment has been presented here as an Appendix to **People and communities** (Volume 6 Document Ref 6.2 Chapter 12).

12.4.4 It should be noted that health effects on travellers using the scheme to travel distances beyond the local area have been scoped out of the health assessment and only communities adjacent to the scheme have been considered.

12.5 Methodology

- 12.5.1 The assessment of health is a multidisciplinary process designed to identify and assess the potential health outcomes (both adverse and beneficial) 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.
- 12.5.2 This section sets out the scope of this assessment and the specific methodology that was followed including the study area, the study population, information and data sources that were consulted, assessment criteria and assessment outcomes.
- 12.5.3 The assessment approach has been qualitative except where informed by quantitative findings from the EIA. The assessment has been informed by and builds on the analysis of the EIA (air quality, noise, socio-economic, etc.).

Study area

- 12.5.4 The study area of the assessment varies between different health determinants (see below) being assessed, however generally data has been assessed from the level of wards that surround the scheme and from the wider Cornwall authority area. This is consistent with the study area applied for the **People and communities**' assessment (Volume 6 Document Ref 6.2 ES Chapter 12).
- 12.5.5 Wards that have been included in the assessment are those that are adjacent to the scheme and include:
- St Agnes;
 - Ladock, St Clements and St Erme;
 - Chacewater & Kenwyn;
 - Perranporth; and
 - Newlyn & Goonhavern.

Baseline data gathering

- 12.5.6 Baseline data has been collated from a range of sources to provide an overview of the existing population, existing health profile, socioeconomic conditions in the local community and the physical environment in the locale.
- 12.5.7 This gathering of baseline data has been coordinated with other workstreams within the EIA such as socioeconomic assessment and the air and noise assessments.
- 12.5.8 The data reviewed has included, but has not been limited to:
- Public Health England publications such as Cornwall Health Profile, 2017;
 - Cornwall Health and Wellbeing Board website;
 - Nomis labour market statistics; and
 - Office for National Statistics, Census 2011 data.

Determinants of health

- 12.5.9 Environmental, social, economic and fixed factors, which are collectively known as 'health determinants' influence health and well-being, i.e. health outcomes within a population.
- 12.5.10 The key determinants of health can be characterised as:
- Pre-determined factors such as age, genetic make-up and gender are fixed and strongly influence a person's health status;
 - Social and economic circumstances such as poverty, unemployment and other forms of social exclusion strongly influence health, and improving them can significantly improve health;
 - How the environment in which people live, work and play is managed - its air quality, built environment, water quality – can damage health, or provide opportunities for health improvement;
 - Lifestyle factors such as physical activity, smoking, diet, alcohol consumption and sexual behaviour, can have significant impacts on health; and
 - Accessibility of services such as the National Health Service (NHS), education, social services, transport (especially public transport) and leisure facilities influence the health of the population.
- 12.5.11 Of these, only the pre-determined factors are unlikely to be influenced by a development proposal. This health assessment therefore considers all relevant health determinants other than the pre-determined factors.
- 12.5.12 Guidance produced by the NHS London Healthy Urban Development Unit has produced an assessment matrix (known as HUDU Rapid Health Impact Assessment Matrix)¹ which can be used to identify a list of potential health determinants that may be relevant to a given project. This in turn allows for the identification of any likely significant effects that would need to be assessed further within the EIA (or presented in addendum to ES).
- 12.5.13 The HUDU matrix has been used to identify the health determinants that are considered to be relevant to the scheme. The full matrix can be found in Appendix A to this document and the determinants that have been identified as being relevant to construction and/or operation are set out in Table 12-1.

Table 12-1 Health determinants relevant to construction and operation phases

Health determinant from HUDU matrix	Relevant to Construction?	Relevant to Operation?
Housing quality and design	x	x
Access to healthcare services and other social infrastructure (including education)	✓	✓
Access to open space and nature	✓	✓
Air quality, noise and neighbourhood amenity	✓	✓
Accessibility and active travel	✓	✓
Crime reduction and community safety	✓	✓
Access to healthy food	x	x

¹ NHS London Healthy Urban Development Unit (HUDU), (2013). Planning for Health 'Rapid Health Impact Assessment Matrix'.

Health determinant from HUDU matrix	Relevant to Construction?	Relevant to Operation?
Access to work and training	✓	x
Social cohesion and lifetime neighbourhoods	x	x
Minimising the use of resources	✓	✓
Climate change	✓	✓

Local community to be considered

- 12.5.14 This health assessment has considered the health and well-being status and current health problems of all people within the local community. However, vulnerable and/or disadvantaged groups can often experience health impacts more acutely than other groups within communities and are therefore more sensitive.
- 12.5.15 The Wales Health Impact Assessment Support Unity (WHIASU) has developed a guide to identifying vulnerable groups for the purpose of health assessments. This has been used to identify which vulnerable groups within the local population should be identified as having high relevance to the scheme and therefore considered in more detail in the assessment.
- 12.5.16 Based on the WHIASU guidance, Table 12-2 identifies which groups are considered to have high relevance to the project and which are therefore considered in more detail in the assessment. The identification of these vulnerable groups is based on a review of the population profile of the local communities within the wards listed above (see Appendix B of this document for the relevant community health and wellbeing profile).
- 12.5.17 The WHIASU vulnerable group checklist systematically considers inequalities and the impacts on a range of vulnerable groups within the population and assesses the extent and distribution of them. These groups can, for example, include older people, children and young people, those who suffer from chronic conditions, or those who are geographically isolated.

Table 12-2 Vulnerable and disadvantaged groups and their relevance to the assessment

Vulnerable and disadvantaged groups	Relevance to assessment (high/medium/low)
Age related groups:	
Children and young people	High
Older people	High
Income related groups:	
People on low income	Medium
Economically inactive	High
Unemployed/workless	High
People who are unable to work due to ill health.	Medium
Groups who suffer discrimination or other social disadvantage:	
People with physical or learning disabilities /difficulties	High
Refugee groups	Low
People seeking asylum	Low

Vulnerable and disadvantaged groups	Relevance to assessment (high/medium/low)
Travellers	Low
Single parent families	Low
Lesbian and gay and transgender people	Low
Black and minority ethnic groups	Low
Religious groups.	Low
Geographical groups:	
People living in areas known to exhibit poor economic and/or health indicators	High
People living in isolated/over-populated areas	High
People unable to access services and facilities	High

Literature review – linking health outcomes to health impacts

- 12.5.18 A literature review was undertaken to establish the evidence for links between the health determinants identified at the scoping stage and potential health outcomes. The health assessment undertaken (Section 12.6) briefly summarises relevant literature for each health determinant.
- 12.5.19 Several types of literature have been used to inform the health assessment including research reports from organisations such as the World Health Organization (WHO), as well as literature reviews, and primary research studies. 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;
 - WHO;
 - National Institute for Health and Care Excellence (NICE);
 - Health Development Agency (HDA).

Assessing population and health effects

- 12.5.20 There is no established or widely accepted framework for assessing the ‘significant’ health effects of a development proposal. The health significance of an environmental impact is typically a function of the ‘magnitude’ and ‘duration’ of the change to health determinants, the extent of the population exposed to this change and the sensitivity of the people (receptors or population) who will experience the effect.
- 12.5.21 Assessment is made as to whether the effect on health determinants is:
- Direct or indirect;
 - Positive or negative; and
 - Permanent or temporary.
- 12.5.22 This approach permits the assessment to provide a relative scale of effects in order to give a sense of the importance of the potential health effects.

12.5.23 The criteria that have been used in order to define significance of effects are set out in Table 12-3.

Table 12-3 Impact Significance Matrix

Significance level	Criteria
<p>Major +++/-- (positive or negative)</p>	<p>Health effects are categorised as a major positive if they prevent deaths/prolong lives, reduce/prevent the occurrence of acute or chronic diseases or significantly enhance mental wellbeing would be a major positive.</p> <p>Health effects are categorised as a major negative if they could lead directly to deaths, acute or chronic diseases or mental ill health.</p> <p>The exposures tend to be of high intensity and/or long duration and/or over a wide geographical area and/or likely to affect a large number of people (e.g. over 500) and/or sensitive groups e.g. children/older people.</p> <p>They can affect either or both physical and mental health and either directly or through the wider determinants of health and wellbeing.</p> <p>They can be temporary or permanent in nature.</p> <p>These effects can be important local, district, regional and national considerations.</p> <p>Mitigation measures and detailed design work can reduce the level of negative effect though residual effects are likely to remain.</p>
<p>Moderate ++/-- (positive or negative)</p>	<p>Health effects are categorised as a moderate positive if they enhance mental wellbeing significantly and/or reduce exacerbations to existing illness and reduce the occurrence of acute or chronic diseases.</p> <p>Health effects are categorised as a moderate negative if the effects are long-term nuisance impacts, such smell and noise, or may lead to exacerbations of existing illness. The negative impacts may be nuisance/quality of life impacts which may affect physical and mental health either directly or through the wider determinants of health.</p> <p>The exposures tend to be of moderate intensity and/or over a relatively localised area and/or of intermittent duration and/or likely to affect a moderate-large number of people e.g. between 100-500 or so and/or sensitive groups.</p> <p>The cumulative effect of a set of moderate effects can lead to a major effect.</p> <p>These effects can be important local, district and regional considerations.</p> <p>Mitigation measures and detailed design work can reduce and in some/many cases remove the negative and enhance the positive effects though residual effects are likely to remain.</p>
<p>Minor/Mild +/- (positive or negative)</p>	<p>Health effects are categorised as minor/mild either, positive or negative, if they are generally lower level quality of life or wellbeing impacts.</p> <p>Increases or reductions in noise, odour, visual amenity, etc. are examples of such effects.</p>

Significance level	Criteria
	<p>The exposures tend to be of low intensity and/or short/intermittent duration and/or over a small area and/or affect a small number of people e.g. less than 100 or so.</p> <p>They can be permanent or temporary in nature.</p> <p>These effects can be important local considerations.</p> <p>Mitigation measures and detailed design work can reduce the negative and enhance the positive effects such that there are only some residual effects remaining.</p>
Neutral/No Effect	No health effect or effects within the bounds of normal/accepted variation.

Limitations and assumptions

- 12.5.24 Literature and baseline data used in the study has been limited to readily available public and published sources. The information contained within the ES and other project documents has been used to characterise the study area and identify impacts on health determinants.
- 12.5.25 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.

12.6 Baseline Conditions - Community Health Profile

- 12.6.1 The community and health profile focuses on population demographics, socio-economic status and community health. Any vulnerable groups within the population, who may be particularly susceptible to health effects, have been identified.
- 12.6.2 Appendix B of this document gives a detailed description of the community and health profile, which gives a picture of the health and social-demographic context of the scheme in order to understand its potential health impacts and the particular population groups that may be affected.
- 12.6.3 The profiling has involved collecting and analysing secondary (existing) data across a number of indicators that relate to the content and context of the scheme, and its possible impacts on health or health determinants. Indicators are measurable variables that reflect the state of a community or of persons or groups in a community.
- 12.6.4 A summary of key issues identified in the community and health profiles are provided below.

Community profile

- 12.6.5 At the 2011 Census, Cornwall had a population of 536,000. In line with national trends, Cornwall's population is getting older as average life expectancy

continues to rise. Expansion in higher education and better employment prospects have, however, led to reductions of younger people leaving Cornwall².

- 12.6.6 Data from the 2011 Census shows that there is a lower proportion of both children and older people in Cornwall than seen regionally and nationally, indicating that the proportion of residents who are of working age is above average. The majority of residents (98%) are from White ethnic backgrounds which compares to 95% in the South West and 85% in England. This demonstrates Cornwall's limited ethnic diversity compared to much of the rest of the country. Around 60% identify as Christians, in line with the regional and national average. The proportion of residents who experience a limiting long-term health problem or disability is higher than the regional and national average, at 21.4%.

Health profile

- 12.6.7 The Public Health England Health Profile for Cornwall in 2017³ concludes that the health profile of people in Cornwall is varied compared with the average for England. Deprivation is lower than average. However, about 19% (16,800) of children live in poverty. Life expectancy is 6.6 years lower for men and 5.1 years lower for women in the most deprived areas of Cornwall than in the least deprived areas.
- 12.6.8 The rate of alcohol-related hospital stays, and the rate of alcohol-specific hospital stays among those under 18, is worse than the average for England. The rate of smoking related deaths is better than average, but there is a higher level of smoking in pregnant women at the time of delivery. Estimated levels of adult excess weight are worse than average, however the proportion of children classified as obese (18%) is lower than average. The rate of self-harm hospital stays is worse than the average for England.
- 12.6.9 There is an Air Quality Management Area within Truro, known as the Truro AQMA. Noise, air quality and neighbourhood amenity are key environmental determinants of health, with poor air quality linked to incidence of chronic lung disease, heart conditions and asthma among children, and noise pollution linked to sleep disturbance, cardiovascular and psycho-physiological effects⁴.
- 12.6.10 The PE Health Profile identifies the local priorities to include reducing smoking rates, reducing physical inactivity, improving people's diets, reducing excessive alcohol intake and improving social connections between residents of Cornwall. These behaviours, (i.e. smoking, little physical activity, excess alcohol, poor diets and weak social connections) lead to health conditions that cause the majority of deaths and disability in Cornwall. These include cardiovascular disease, cancer, mental illness, lung disease and musculoskeletal problems.

12.7 Assessment of effects

- 12.7.1 The assessment of effects considers each of the determinants of health, identified in Table 12-1 (using significance levels as set out in Table 12-3). Findings from the literature review are firstly set out followed by an assessment of how, as a result of the scheme, the determinants of health are likely to affect each of the

² <https://www.cornwall.gov.uk/council-and-democracy/data-and-research/data-by-topic/population/>

³ <http://fingertipsreports.phe.org.uk/health-profiles/2017/e06000052.pdf>

⁴ NHS London Healthy Urban Development Unit (2017), Rapid Health Impact Assessment Tool

identified vulnerable and disadvantaged groups of people within the population (see Table 12-2).

- 12.7.2 The assessment matrixes below are an overall summary of this assessment which is elaborated on more within each assessment section. Consideration has been given to both the construction and operational phases (Table 12-4 and Table 12-5 respectively).

Table 12-4 Construction phase impacts

	Determinants of health	Access to healthcare services and other social infrastructure (including education)	Access to open space and nature	Air quality, noise and neighbourhood amenity	Accessibility and active travel	Crime reduction and community safety	Access to work and training	Use of resources	Climate change
People affected									
Children and young people		~/-	~	-	-	~	+	~	~/-
Older people		~/-	~	-	-	~	~	~	~/-
People on low incomes		~	~	-	~	~	+	~	~/-
Economically inactive		~	~	-	~	~	+	~	~/-
Unemployed/workless		~	~	-	~	~	+	~	~/-
Long term sick		~	~	-	~	~	~	~	~/-
People with physical/learning difficulties		~	~	-	~	~	~	~	~/-
People in areas of poor economic/health status		~/-	~	-	~	~	~/+	~	~/-
People living in isolated areas		~/-	~	-	~	~	~	~	~/-

12.7.3 The vulnerable people and groups captured above can be collated into the following categories along with the wider community:

People living/working in the adjoining wards		~/-	~	-	~/-	~	~/+	~	~/-
People living/working in wider Cornwall		~	~	-	~	~	~/+	~	~/-

Key: Red = adverse effect | Amber = mixed effect | Green = positive effect

Table 12-5 Operation phase impacts

	Determinants of health	Access to healthcare services and other social infrastructure (including education)	Access to open space and nature	Air quality, noise and neighbourhood amenity	Accessibility and active travel	Crime reduction and community safety	Access to work and training	Climate change
People affected								
Children and young people		~/+	+	— —/+ +	+	~	+	~
Older people		~/+	~/+	— —/+ +	~/+	~	~	~
People on low incomes		~	+	— —/+ +	~/+	~	+	~
Economically inactive		~/+	+	— —/+ +	~/+	~	+	~
Unemployed/workless		~/+	+	— —/+ +	~/+	~	+	~
Long term sick		~	~	— —/+ +	~	~	~/+	~
People with physical/learning difficulties		~	~	— —/+ +	~	~	~/+	~
People in areas of poor economic/health status		~	~	— —/+ +	~	~	~/+	~
People living in isolated areas		~/+	~/+	~	+	~/+	~/+	~

12.7.4 The vulnerable people and groups captured above can be collated into the following categories along with the wider community:

People living/working in the adjoining wards		~/+	~/+	— —/+ +	~/+	~	~/+	~
People living/working in wider Cornwall		~	~	— —/+ +	~	~	~/+	~

Key: Red = adverse effect | Amber = mixed effect | Green = positive effect

Access to healthcare services and other social infrastructure (including education)

Literature review

- 12.7.5 Services and social infrastructure such as healthcare, education, social networks and social interaction can impact on people's physical and mental health⁵. Five percent of adults in Great Britain have reported feeling a sense of isolation due to difficulties accessing local shops and services⁶.
- 12.7.6 Access to health facilities has a direct positive effect on health⁷. Access to healthcare is important for communities as healthcare offers information, screening, prevention and treatments. Restricted access to healthcare prevents patients gaining necessary treatments and information.
- 12.7.7 Access to healthcare services is affected by transport modes, availability of financial support for those on low incomes and the location of healthcare services. Groups impacted by disability, long-term illnesses and older people are more dependent on health and social care services⁸, and are therefore more vulnerable if access to health and social care services becomes restricted.
- 12.7.8 Access to social infrastructure including leisure and cultural facilities is a determinant of health and well-being. According to research 'leisure activities can have a positive effect on people's physical, social, emotional and cognitive health through prevention, coping (adjustment, remediation, diversion), and transcendence'⁹. People participate in cultural activities for a number of reasons including personal growth and development, to learn new skills, enjoyment and entertainment and as a 'means of creative expression', or 'to meet new people' and to 'pass on cultural traditions'¹⁰.

Construction effects

- 12.7.9 Physical access to healthcare services will not be affected by the scheme during the construction phase, i.e. people will still be able to reach these services. The construction workers are also unlikely to increase pressure on the services since the majority of them are likely to stay registered with their own local practices (if working from outside the region) or already be registered locally if they themselves are from the local area. Any unforeseen accident and emergency requirements requiring local services are likely to result in negligible effects given the limited nature and duration associated with that demand.
- 12.7.10 The loss of Marazan Farm Campsite is not likely to have an adverse effect on the health and local community as campsites attract people from outside the local area who are likely to look for alternative sites in the area. The adverse effect is therefore economic in nature and only directly relevant to the current owner and occupiers of the site.

⁵ Global Research Network on Urban Health Equity (2010) Improving urban health equity through action on the social and environmental determinants of health

⁶ Randall, C., 2012, Measuring National Well-being - Where We Live – 2012, Office for National Statistics

⁷ HUDU. (2013). Planning for Health. Rapid Health Impact Assessment Tool. London: National Health Service, London Healthy Urban Development Unit.

⁸ Harner, L. (2004). Improving patient access to health services: a national review and case studies of current approaches. Health Development Agency.

⁹ Caldwell, L.L. (2005) Leisure and health: Why is leisure therapeutic?

¹⁰ New Zealand Government, 2007, Social Report: Leisure and Recreation, Ministry of Social Development, New Zealand Government

- 12.7.11 During construction access to some healthcare, leisure and tourism facilities may be affected due to the need to provide temporary closures and diversions for existing access. This would particularly be likely to be experienced by people living and working in the adjoining wards and children/young people, older people, and people with poor health may be affected differentially because they are more likely to use these facilities. However, in these circumstances, temporary, alternative access arrangements would be provided so that access to these facilities will not be significantly adversely affected during construction and therefore there would be no adverse effect on health.
- 12.7.12 There are likely to be short term and temporary increased journey time unreliability when traffic management measures are required during construction. That could increase driver stress albeit the impact on health is likely to be neutral.
- 12.7.13 Overall it is considered that the construction phase of the scheme would result in a short-term minor adverse health effect for people living and working in the adjoining wards and a neutral effect for those in wider Cornwall.

Operation effects

- 12.7.14 Once the scheme has been completed it is likely that ease of access to healthcare services and other social infrastructure will be improved due to the reduced amount of travel time/reduced congestion that the improved A30 will offer. This therefore would result in minor positive health effects, particularly for those whose access to social infrastructure 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. Overall it is considered that there would be a neutral health effect with regards to access to healthcare and other social infrastructure.

Access to open space and nature

Literature review

- 12.7.15 Access to open space, green space and nature has health benefits, in relation to increasing physical activity¹¹, as well as for mental wellbeing^{12 13}.
- 12.7.16 A Forestry Commission¹⁴ review identified the key health benefits of green space as:
- Long and short term physical benefits associated with obesity, life expectancy, heart rate and blood pressure;
 - Attention and cognitive benefits associated with restoration, mood and self-esteem;
 - Physical activity benefits associated with the use of greenspace;
 - Self-reported benefits in terms of health and life satisfaction; and
 - Community cohesion benefits through social contact fostered by greenspace.

¹¹ Scrivens, K. S. (2013). Four interpretations of social capital: an agenda for measurement. Working Paper no. 55. ODCD.

¹² Gong Y, P. S. (1996). A systematic review of the relationship between objective measurements of the urban environment and psychological distress. *Environment International* , 48-57.

¹³ Lee, A. (2010). The health benefits of urban green space: a review of the evidence. *Journal of Public Health* , 33 (2), 212-222.

¹⁴ O'Brien, L., Williams, K., Stewart, A. (2010), Urban health and health inequalities and the role of urban forestry in Britain: A review, The Research Agency of the Forest Commission

- 12.7.17 Studies have found that the amount of green space and the walkability, connectivity and accessibility of the neighbourhood influence adult and children's mental health and physical health^{15 16}. The attractiveness or quality of green space is also an important determinant of use of green space¹⁷.
- 12.7.18 Contact with nature has positive health benefits through its positive effects on blood pressure, cholesterol and stress reduction, with particular relevance to mental health and cardiovascular disease¹⁸. Green space can also provide spaces to promote social interaction and cohesion¹⁹, and reduce social annoyances and crime, all of which can contribute to the mental health of individuals²⁰.
- 12.7.19 Vulnerable populations include the poorest people who often experience poorer quality outdoor environments and suffer disproportionately from a lack of equitable access to ecology and green spaces. Recent research has suggested that there is a positive association between the percentage of green space in a person's residential area and their perceived general health and that this relationship is strongest for lower socio-economic groups²¹.

Construction phase effects

- 12.7.20 During construction there would likely be a variety of effects on the local Public Rights of Way (PRoW) ranging from complete closure and re-provision/redirection to temporary diversions. These will be managed (via a PRoW Management Plan) to help ensure public safety and minimise disruption to users. It is Highway England's intention to keep the majority of PRoW open via local management, early re-provision and/or use of short-term, temporary closures. The local routes and proposed mitigation during construction are detailed in Chapter 12 of the ES.
- 12.7.21 In all cases, realignment or diversion of these local routes is proposed, utilising new side roads, overbridges and junctions where possible to maintain access for users. This will enable local communities to maintain access to recreational assets within the affected area.
- 12.7.22 The landscape assessment of the ES confirms that the character of the landscape in which the scheme passes would experience temporary and reversible effects that are not significant.
- 12.7.23 No health effect is anticipated in relation to access to green space and nature during the construction phase.

Operation phase effects

- 12.7.24 Once the scheme has been completed facilities for walking, cycling and horse-riding will have been improved; a key element of the strategy is to grade separate all the existing side road crossings including 'quiet lanes' with either an overbridge or underpass. In addition, the existing A30 will be substantially quieter once the

¹⁵ Lee, A. (2010). The health benefits of urban green space: a review of the evidence. *Journal of Public Health*, 33 (2), 212-222.

¹⁶ Ward, J. S. (2016). Ward et al, 2016. The impact of children's exposure to greenspace on physical activity, cognitive development, emotional wellbeing, and ability to appraise risk. *Health and Place*, 40, 44-50.

¹⁷ Croucher, K. M. (2007). The links between greenspace and health: a critical literature review. Greenspace Scotland.

¹⁸ Maller, C. T. (2005). Healthy Nature Healthy People. *Health Promotion International*, 21 (10).

¹⁹ Lee, A. (2010). The health benefits of urban green space: a review of the evidence. *Journal of Public Health*, 33 (2), 212-222.

²⁰ Maas, J. (2006). Green space, urbanity and health: how strong is the relation? *Journal of Epidemiology and Community Health*, 60 (7), 587-592.

²¹ Maas, J. (2006). Green space, urbanity and health: how strong is the relation? *Journal of Epidemiology and Community Health*, 60 (7), 587-592.

new dual carriageway is open and therefore provide a safer and more pleasant route for walking, cycling and horse-riding.

- 12.7.25 There would also be new rights of way proposed as part of the scheme, as detailed in Chapter 12 of the ES. Those would help improve connectivity.
- 12.7.26 As a result of the improvements it is predicted that health effects would be long term, beneficial and minor assuming that more people would choose to use the facilities as a result of improvements made. It is considered that those people who are less able to travel longer distances to benefit from access to open spaces are most likely to benefit from these improvements, including young people, economically inactive, unemployed and those living in isolated areas.

Air quality, noise and neighbourhood amenity

Literature review

- 12.7.27 The term 'neighbourhood amenity' is used in this assessment to relate to the combined impacts of noise, air emissions, traffic and visual impacts on the quality and amenity of the local environment in which people live.

Traffic

- 12.7.28 Transport accounts for around 29% of the UK's CO₂ emissions²². The relationships between transport and health are multiple and complex, and transport also provides access to work, education, social networks and services, which can improve people's opportunities²³. There is strong evidence that traffic interventions reduce road accidents, while there is some inconclusive evidence that they improve physical activity²⁴. The impact of transport on health inequalities is greatest when looking at deaths from road traffic injuries, especially for children, as they are four times more likely to be hit by a car in the 10% most deprived wards than in the least deprived wards²⁵. Fatal accidents on the road are also particularly high among children of parents classified as never having worked or as long-term unemployed.
- 12.7.29 One of the findings of the Marmot Review (2011)²⁶ indicates that there is strong evidence that reductions in traffic to reduce air pollution are successful in improving health and in poorer communities, which have a higher prevalence of cardio-respiratory and other diseases, would therefore benefit proportionately more from air quality improvements.

Noise

- 12.7.30 According to the World Health Organization (WHO), 'in some situations noise may adversely affect the health and wellbeing of individuals or populations'. The WHO recognises the health linkages between environmental noise and annoyance, sleep disturbance and physiological responses such as cardiovascular disease. There are a wide range of non-auditory health effects that may be associated with exposure to environmental noise. In the everyday environment, the response of

²² Environment Agency. Addressing environmental inequalities: position statement. 2004.

²³ Great Britain. Department of the Environment Tatr, University of North London. Transport Research and Consultancy. Social exclusion and the provision and availability of public transport: report by TRaC at the University of North London for the Department of the Environment, Transport and the Regions. London: Department of the Environment, Transport and the Regions, 2000.

²⁴ Boyce T, Patel S, The Kings Fund. The Health Impacts of Spatial Planning Decisions. 2009.

²⁵ Grayling T, Institute for Public Policy Research. Streets ahead: safe and liveable streets for children. London: IPPR, 2002.

²⁶ The Marmot Review report – Fair Society, Healthy Lives. A strategic review of health inequalities in England post 2010

an individual to noise is more likely to be behavioural or psychological (i.e. non-auditory) than physiological.

- 12.7.31 The WHO suggests that some people may be less able to cope with the impacts of noise exposure and be at greater risk for harmful effects, including the elderly, the physically ill, those with existing mental illness, people with hearing impairment, and young children. Families with lower income tend to have lower mobility but greater exposure to adverse environmental conditions related to noise pollution²⁷.

Air quality

- 12.7.32 Evidence on the links between road traffic emissions and respiratory health is well established, based on numerous research studies. The main health damaging pollutants released as emissions from road traffic are particulate matter (PM₁₀) and nitrogen dioxide (NO₂)²⁸. It is generally accepted that particles greater than 10µm in diameter (PM₁₀) do not penetrate the lungs to cause respiratory health problems. However, dust can cause eye, nose and throat irritation and lead to deposition on cars, windows and property²⁹.
- 12.7.33 Populations thought particularly vulnerable to the effects of PM₁₀ are those with pre-existing lung or heart disease, the elderly and children^{30 31}.

Landscape and visual amenity

- 12.7.34 Research into the effects of the visual and aesthetic environment on well-being is mainly focused on the psychological effects of 'natural' versus 'man-made' or urban views. In general, evidence shows a preference for views of natural over man-made scenes. These links are often tied in with each other, related issues such as opportunities for exercise and contact with nature. Open spaces and natural scenes can improve physical health, comfort, and mental well-being, as well as provide opportunities to improve people's quality of life and social interactions.

Construction phase effects

Traffic

- 12.7.35 The majority of the construction of the scheme would take place offline, which would minimise impacts on road users of the existing A30 and side roads. Some sections would involve online works with interfaces between the scheme and existing roads, for example at the junctions and at Chybucca and Tolgroggan.
- 12.7.36 The **People and communities** (Volume 6 Document Ref 6.2 ES Chapter 12) chapter of the ES indicates that during construction, traffic management measures including limited temporary diversions and speed limits where works interface with existing roads could result in minor delays and frustration and increased fear of accidents. There would also be additional construction traffic,

²⁷ World Health Organization. (2011). Burden of Disease from Environmental Noise. Geneva, Switzerland: World Health Organization Europe.

²⁸ COMEAP (2015). Statement on the evidence for the effects of Nitrogen Dioxide on health. Committee on the medical effects of air pollutants.

²⁹ The control of dust and emissions from construction and demolition Best Practice Guidance, Greater London Authority (2006)

³⁰ World Health Organization. (2013). Health effects of particulate matter. Denmark: World Health Organization Europe.

³¹ Defra, Netcen, Department for Communities and Local Government, National Statistics. (2006). *Air Quality and Social Deprivation in the UK: an environmental inequalities analysis (AEAT/ENV/R.2170)*. London: Defra.

largely HGVs and construction machinery, which are typically slower moving vehicles. Best practice mitigating measures such as safety measures, short diversions and off-peak working where practicable will be detailed in a Traffic Management Plan.

- 12.7.37 During construction bus travellers' access to two bus stops at Marazanvose (one in each direction) adjacent to the A30 and in close proximity to the Marazan Farm Campsite / Marazanvose Farm would be affected temporarily. To mitigate this effect, it is proposed that early consultation with bus operators is carried out alongside provision of advance travel information for passengers.
- 12.7.38 These interruptions to traffic flows and bus services is temporary but may cause anxiety for those people reliant on public transport, however it is thought that with the proposed mitigation health effects are likely to be neutral.

Noise

- 12.7.39 Temporary significant construction noise has been identified at a number of residential properties:
- Highfield (also representative of The Annex and Burrow Farm);
 - Roscarnick Farm;
 - Elmsleigh (also Barn Wyn, Treffry Cottage, 1 The Cottages, Ranger Barn),
 - Henvor Lane Cottage (also Henvor Cottage);
 - Pennycomequick;
 - Honeycombe Barn (also Honeycombe House and residential Caravan).
 - The Stables and nearby residences;
 - Callestick Vean Bungalow;
 - NFH Villa;
 - Zelah Lane Farm, Zelah Lane Farm Annexe, Trolgroggan Bungal, Chapel Cottage, The Nook Zelah Lane and The Chapel; and
 - 2 Church Lane and nearby residences.
- 12.7.40 Temporary significant construction noise has also been identified for a number of non-residential receptors, post mitigation:
- Mithian Church Hall,
 - The Church of St Peter,
 - NFH wedding venue; and
 - Trevarth Holiday Park.

- 12.7.41 At these locations, particularly at the residential properties, health effects are identified as temporary, minor adverse effects. They are classified as minor due to the number of people affected by the construction noise, which is relatively few within the overall community.

Air quality

- 12.7.42 The air quality assessment has identified a number of receptors which could experience adverse effects as a result of construction activities (including activities associated with compounds, construction, demolition and trackout). A total of 584 receptors were identified which were identified based on proximity to affected roads, being representative of the maximum effects of the scheme in that

region and the risk of exceeding the annual mean NO₂ Air Quality Objective (AQO). Receptors included dwellings, hospitals and educational establishments.

- 12.7.43 Emissions from construction heavy goods vehicles were scoped out of the assessment due to the temporary nature of the works and the minimal impact the additional vehicles would have on overall pollutant concentrations³². Emissions from site equipment have been scoped out of the assessment due to the temporary nature of the works and the minimal impact the site equipment would have on overall pollutant concentrations.
- 12.7.44 A qualitative assessment of the impacts of nuisance dust arising during construction was undertaken, using guidance set out in paragraph 3.45 of DMRB HA207/07. Properties within 200m of dust producing activities were identified and the assessment confirmed that construction activities close to these (within the towns of Chiverton, Maranzavose, Zelah and Mitchell) would require mitigation in order to reduce the adverse impact from dust. This mitigation would include standard construction management practices in order to minimise the frequency and intensity of any dust episodes. Vulnerable groups within these locations such as children, elderly or people with respiratory illnesses may still experience some adverse health effects due to dust; however, it is considered that provided the mitigation measures to control dust emissions are adhered to, these effects would be short term, minor adverse.

Landscape and visual amenity

- 12.7.45 During the construction phase no significant landscape effects are predicted. A number of receptors have been predicted to receive significant short term and reversible adverse visual effects. These include:
- Residential receptors at Callestick Vean (south), Maranzavose, Polstain Farm and Pennycomequick;
 - Pedestrians and equestrians using bridleway 314/64/1, bridleway 319/9/1, footpath 319/16/1 and in Newlyn Downs Open Access Land;
 - Cyclists using NCR 32 near Henvver Lane;
 - People enjoying the views to and from nearby heritage asset – Bowl Barrow (1016103) and the Barrow Cemetery at Carland Cross (1016888, 1017050, 1020758); and
 - Outdoor workers at NFH.
- 12.7.46 From a health perspective, residential receptors will be experiencing short term construction effects in the knowledge that this will lead to permanent changes to their views once the A30 is completed. It is considered that this is likely to result in long term, minor adverse health effects.

Combined construction effect from construction noise, air and landscape effects

- 12.7.47 Considering the combined effects from traffic, air quality, noise and landscape and visual amenity it is considered that the health effects on the health of the community will be short term, minor adverse. However, vulnerable groups within the population such as children and older people may experience these effects to a great degree, albeit, still likely to be minor adverse.

³² Guidance recommends that where HGV trips are less than an additional 200 per day or where additional AADT does not exceed 1000, no significant effects are likely in relation to air quality.

Operational phase effects

Traffic

12.7.48 Traffic modelling has identified that traffic volumes would increase and decrease on the following roads surrounding the existing A30. These are listed in Table 12-6 below.

Table 12-6 Changes in traffic volumes

Increases in traffic volumes	Decreases in traffic volumes
B3298 – Scorrier to Gwennap	Chasewater to Devoran
A393 – Gwennap to A39	A390 – A30 to Truro
B3284 – Truro to A30	A390- South of Truro
A3076 – A30 to Gummows Shop	A39 – Carland Cross to Truro
A3058 Gummows Shop to A392	A390 – Truro to Hewas Water
A3058 – St Stephen to Sumercourt	B3275 – A390 to Brighton
	A39 – Truro to A393 Junction
	Shortlandsend to Zelah
	B3285 – Perranporth to Goonhavern
	A392 – Trevarren to A3075
	A3075 – A392 to A30

12.7.49 Where the traffic is predicted to increase, this is likely to have a long term, minor adverse effect on the health of the vulnerable population groups such as children and older people who may experience intimidation from the extra traffic and therefore reduce their time outdoors being active.

12.7.50 Conversely, there are a number of routes on which traffic flows are predicted to reduce (Table 12-6) and in these locations this is likely to have a long term, minor beneficial effect on the health of the same vulnerable population groups who may become more inclined to spend time outdoors being active where nearby traffic flows are reduced.

Noise

12.7.51 The noise assessment notes that many of the properties within the study area would exceed noise limit values in the absence of the scheme and some are already in Noise Important Areas³³. Notwithstanding this, the noise assessment

³³ Noise Important Areas are areas which have been identified as requiring Noise Action Plans to reduce the level of noise being experienced in these locations.

identifies several communities as being subject to direct, likely significant adverse effects in 2038. These are all to the northwest of the scheme, as follows:

- dwellings nearest to the proposed new Chiverton Junction around chainage 1+700.000;
- small groups of dwellings further from the scheme (approximately 250m) between chainages 1+500.000 and 2+000.000; and dwellings just beyond chainage 2+000.000.

12.7.52 For 34 other properties that are predicted to exceed recommended limit levels in the 2023 do nothing scenario, the noise assessment identifies that there would be reductions in noise by 2038 with the scheme. Properties within five noise important areas would also experience decreases in noise. These include:

- Four Burrows Farm House (NIA 13097),
- Marazanvose Farm group of dwellings (NIA 3291),
- Henvor Cottage (NIA 3292),
- Tregorland and Zelah Hill Cottage (NIA 3293); and
- Racland House and Four Winds (within NIA 3294)

12.7.53 The noise assessment identifies a number of indirect noise effects that would arise as a result to changes to affected road links to the south of the scheme. A total of 637 properties within 50m of these road links have been identified as having a significant noise increase (3dB increase).

12.7.54 Overall, at the community level, the balance of increased and decreased noise levels as a direct effect from the scheme is predicted to result in a health effect that is long term, minor adverse based on the number of people affected (i.e. few people). However, the indirect noise effects resulting from the changes in traffic flows at the affected road links to the south of the scheme lead to significant noise levels which have the potential to lead to adverse health effects of moderate significance.

Air quality

12.7.55 The air quality assessment carried out a detailed assessment using an air dispersion model ADMS-Roads v.4.1.1.0 to determine the potential effects on annual mean NO₂ concentrations at selected sensitive receptors, in accordance with HA207/07 guidance. In particular, modelled concentrations were compared with the EU limit value for annual mean NO₂ following the method detailed in IAN175/13 to provide a clear indication of the scheme's potential to affect the UK's ability to comply with the Air Quality Directive³⁴.

12.7.56 The air quality assessment identifies that there are no modelled exceedances of the annual mean NO₂ objective in the baseline or in the Do-Minimum or Do-Something 2023 scenarios along the A30. Whilst there are no predicted exceedances, it is likely that on routes where traffic is predicted to increase (see Table 12-6), air quality will be reduced (even if it stays within exceedance levels). The population health (particularly those of vulnerable groups such as children, elderly or sick) along these sections are therefore likely to experience minor, adverse health effects in relation to air quality.

³⁴ UK Government, The Air Quality Standards Regulations 2010, SI 2010/1001, 2010

Landscape and visual amenity

- 12.7.57 Once landscape mitigation has become established (estimated 15 years post completion), the landscape assessment concludes that there would not be any significant landscape effects. Prior to mitigation becoming established the effects are assessed to be short-medium term and significant adverse.
- 12.7.58 The following receptors are predicted to receive significant long-term and irreversible adverse residual visual effects as a result of the operation of the scheme.
- Residential receptors at Maranzavose, Hill House, Pennycomequick, Journey's End, Racland House, Four Winds, Zelah Hill Cottage, Mount Pleasant, and Tregorlands
 - Pedestrians and equestrians using footpath 319/16/1, bridleway 319/9/1 and in Newlyn Downs Open Access Land
 - People enjoying the views to and from nearby heritage assets – Barrow Cemetery at Carland Cross (1016888, 1017050, 1020758); and
 - Outdoor workers at NFH.
- 12.7.59 From a health perspective, residential receptors will be experiencing long term minor adverse health effects. The health effect from this visual change is not considered to be more significant than this as the views will remain predominantly rural.

Combined operation effect from noise, air and landscape effects

- 12.7.60 Whilst there will be some benefits for some people along the existing A30 in terms of reduced traffic flows, reductions in noise and air pollution, the combined health effects from air quality, noise and neighbourhood amenity effects of the scheme are predicted to be long term, minor adverse effects. The in-combination cumulative effect is not considered to be of greater magnitude than this.

Accessibility and active travel

Literature review

Accessibility

- 12.7.61 Research indicates that public transit improvements and more transit oriented development can provide large but often overlooked health benefits. People who live or work in communities with high quality public transportation tend to drive significantly less and rely more on alternative modes (walking, cycling and public transit) than they would in more automobile-oriented areas. This reduces traffic crashes and pollution emissions, and increases physical fitness and mental health. These impacts are significant in magnitude compared with other planning objectives, but are often overlooked or undervalued in conventional transport planning³⁵.

Active travel

- 12.7.62 Active travel applies to modes of transport that require physical activity (i.e. cycling and walking), in contrast to modes that require little physical effort such as

³⁵ Litman, T (2010), Evaluating public transportation health benefits. Victoria Transport Policy Institute.

motor vehicles. It is therefore the physical activity associated with active travel that brings about health effects.

- 12.7.63 Active travel in areas with low pollution levels has been associated with increased physical activity among older adults. Where there is a perception that there is air pollution this appears to constitute a barrier to participating in outdoor physical activity and active transport³⁶.
- 12.7.64 The positive effects of physical activity on physical health was summarised in the Department of Health's 2011 report³⁷ which suggests that:
- 12.7.65 'Regular physical activity can reduce the risk of many chronic conditions including coronary heart disease, stroke, type 2 diabetes, cancer, obesity, mental health problems and musculoskeletal conditions. Even relatively small increases in physical activity are associated with some protection against chronic diseases and an improved quality of life.'
- 12.7.66 An ever-growing body of research also provides consistent evidence of a relationship between physical activity and mental capacity, especially in older and elderly people. Longitudinal studies show not only that physical activity is associated with a reduced risk of age-related cognitive decline, but also that regular physical activity is linked to a lower risk of Alzheimer's disease (AD) and other forms of dementia³⁸. Age UK's guidelines also outlines examples of practical ways to promote older people to become more active, including Nordic walking, Tai-Chi sessions aimed at older people, walking groups, and an 'easy rider' scheme (using a fixed-wheel bike, tricycles and tandems to aid balance)³⁹.

Construction phase effects

- 12.7.67 During the construction phase accessibility to public transport will not be affected significantly as services will still run. Where diversions are required, this is not predicted to affect the overall provision of the service.
- 12.7.68 Active travel options during the construction phase are likely to be minimally affected. As discussed in Section 12.7.15, during construction there will be a variety of effects on the local Public Rights of Way (PRoW) ranging from complete closure and reprovision/redirection to temporary diversions. In all cases, realignment or diversion of these local routes is proposed, utilising new side roads, overbridges and junctions where possible to maintain access for users. This will enable local communities to maintain access to active transport options during the construction phase, albeit if inconvenienced for a short period.
- 12.7.69 As such, any health effects are likely to be short term, minor adverse. However, adverse effects are likely to be differentially experienced by those for whom small changes to the distances of PRoW may discourage their use, e.g. older people or those with limited mobility.

36 Annear, M., Keeling, S., Wilkinson, T., Cushman, G., Gidlow, B., & Hopkins, H. (2014). Environmental influences on healthy and active ageing: A systematic review. *Ageing & Society*, 34 (4), 590-622

37 CMO (2011) Start Active, Stay Active: A report on physical activity from the four home countries' Chief Medical Officers, Department of Health, Physical Activity, Health Improvement and Protection.

38 Government Office for Science. (2008). Mental Capital and Wellbeing: Making the most of ourselves in the 21st century. State-of-Science Review: SR-E24, p.2.

39 Age UK. (2010). Promoting Mental Health and Well-being in Later Life: A Guide for Commissioners of Older People's Services

Operational phase effects

- 12.7.70 Once the scheme is fully operational, active travel facilities for walking, cycling and horse-riding will have been improved and new routes proposed. In addition, the existing A30 will be substantially quieter once the new dual carriageway is open and therefore provide a safer and more pleasant route for walking, cycling and horse-riding.
- 12.7.71 As a result of the improvements it is predicted that health effects would be long term, beneficial and minor assuming that more people would choose to use the active travel facilities as a result of improvements made. This would include people choosing to commute for work or using the facilities for recreational purposes.

Crime reduction and community safety

Literature review

- 12.7.72 Community safety is crucial in determining health and wellbeing. It has been stated that ‘a healthy community protects and improves the quality of life for its citizens, promotes healthy behaviours and minimizes hazards for its residents, and preserves the natural environment.’ The effects of crime on health include both direct effects, for example through violence, and indirect social and psychological effects arising from fear of crime⁴⁰.
- 12.7.73 A review undertaken by Lorenc et al⁴¹ looked at qualitative evidence on the fear of crime and the environment. The report notes that most research on crime and health focused on the direct health effects suffered by victims of crime. However, indirect effects of crime and its broader influence on individuals and communities may also have important effects on wellbeing.
- 12.7.74 General environmental improvements have the potential to reduce fear of crime⁴². For example, poor lighting, graffiti or general lack of maintenance increase people’s perception that crime is more likely to take place in these areas. Improving the environment, e.g. through improved lighting, landscaping and regular maintenance therefore helps people to reduce the fear of associated crime.
- 12.7.75 Social inequalities are particularly marked in urban environments, with different population subgroups experiencing impacts to different degrees. Older people are identified as being particularly likely to suffer as a result of fear of crime.

Construction phase effects

- 12.7.76 It is not considered that the construction phase of the scheme would influence the crime rates within the local communities and therefore no health effect in this regard is predicted.

⁴⁰ British Medical Association (1999). ‘Health and Environmental Impact Assessment: an Integrated Approach’. Earthscan Publications Ltd.

⁴¹ Lorenc, T., Petticrew, M., Whitehead, M., Neary, D., Clayton, S., Wright, K., Thomson, H., Cummins, S., Sowden, A., Renton, (2012). A. Fear of crime and the environment: systematic review of UK qualitative evidence, BMC Public Health. 13: 496.

⁴² McCormack, G.R., & Shiell, A. (2011). In search of causality: a systematic review of the relationship between the built environment and physical activity among adults. Int J Behav Nutr Phys Act [online]. 8 (1), 125.

- 12.7.77 During the construction phase, community safety issues would relate to the potential for increased accidents as a result of temporary HGV movement, and construction traffic. This traffic would use the existing A30 but will access the construction site and compounds off the associated side roads, including the A390, B3284, A39, Allet Road, Shortlanesend Road and Pennycomequick Road.
- 12.7.78 To help mitigate or avoid adverse impacts on the local communities accessed from those roads, a haul road would be established by the contractor through sections of the alignment, with site-won material to be moved using the haul road rather than the existing A30 and its side roads where practicable, with plant crossings required on some of the side roads as necessary.
- 12.7.79 The CEMP also outlines mitigation measures to help ensure the safety of the local community during works. For example, clear signage and best practice techniques would be applied. When work is required online, a series of traffic management measures will be implemented including single way working of traffic in each direction maintained at all times. A mandatory 40mph speed limit would be imposed where construction occurs in the vicinity of the existing A30.
- 12.7.80 As such, the impact on community safety during works is considered to be temporary, minor adverse depending on the proximity of communities to construction works. With mitigation in place, the effect on community safety during the construction stage is not considered to be significant.

Operational phase effects

- 12.7.81 It is not considered that the operational phase of the scheme would influence the crime rates within the local communities and therefore no effect in this regard is predicted.
- 12.7.82 During consultation on the proposals by Highways England, there were safety concerns expressed related to lighting at junctions, particularly at Chiverton Junction, i.e. it was raised that lighting should be provided at these locations. As a result of these concerns, ducting will be provided as part of the current scheme, to enable the possibility of implementing lighting in the future. Once the scheme is open to traffic, the situation will be monitored by Cornwall Council to establish if lighting is required. It is considered that this aspect of community safety (if required and implemented) will result in long term minor beneficial effects.
- 12.7.83 Traffic modelling results show that with the scheme in place, over the appropriate 60-year appraisal period, the forecast reduction in accidents is expected to be 772. The existing section of A30 between Chiverton and Chybucca has nearly double the national average of personal injury accidents (PIAs) (Chapter 12, People and Communities). The accident analysis software (COBA-LT) assumes national average accident rates for the future year scenario with the scheme compared to the rates without the scheme. For the new section of dual carriageway between Chiverton and Chybucca the accident rate would be in-line with the national average, which is a much-reduced accident rate, largely as a result of the safe and modern design standard of the new road. The fear of accidents would therefore be reduced.
- 12.7.84 Furthermore, the average forecast peak period traffic flows on local roads near the A30 as a result of the scheme, show a reduction with traffic on local roads reducing by up to 40%. That would result in the local roads experiencing, on

average, less traffic. Those conditions would be favourable to community severance, the movement of people, and safety.

- 12.7.85 As such, there would be slight community safety benefits as a result of the scheme.

Access to work and training

Literature review

- 12.7.86 The Marmot Review (2010)⁴³ looked at the differences in health and well-being between social groups. The Review identified the importance of work for health: 'being in good employment is protective of health. Conversely, unemployment contributes to poor health.'
- 12.7.87 The documented linkages between access to work and health are often related to the negative impacts of unemployment, rather than the positive impacts of employment. However, it follows that employment is generally expected to be positive in health terms.
- 12.7.88 Employment is related to social and psychological well-being; a study commissioned by the Department of Work and Pensions⁴⁴ found that 'work meets important psychosocial needs in societies where employment is the norm' and that 'work is central to individual identity, social roles and social status'.
- 12.7.89 Training is a form of work involving the application of physical or mental effort to improve skills, knowledge or other personal resources which can improve chances of employment and career progression.

Construction phase effects

- 12.7.90 The **People and Communities** assessment (Volume 6 Document Ref 6.2 ES Chapter 12) identifies that it is estimated the scheme will employ approximately 500 people at its peak. This is to include approximately 350 construction workers (70% of the total) and 150 wider project staff (30% of total).
- 12.7.91 Due to the geographic location of the proposed Scheme and the type / volume of construction skills required, it is anticipated that a large proportion of the construction workforce will be 'imported' into the area and therefore made up of workers travelling from outside the area and staying locally.
- 12.7.92 As the majority of the workforce will be from outside the local area, the health benefits associated with employment will be dissipated beyond the local communities. However, in addition to the direct employment there is also likely to be some induced employment within the tourism sector which is likely to provide some of the accommodation needed to house the workforce which is travelling into the area for the work.
- 12.7.93 New spend within the local economy by these workers is also likely to benefit local businesses. The People and Communities Chapter estimates that the scheme could bring in the region of £3.6m to £4.1m additional spend into the local economy over the 31-month construction period. This is relatively small when compared to the overall tourism spend in Cornwall which stood at approximately

⁴³ Marmot M. (2010) Fair Society, Healthy Lives: A Strategic Review of Inequalities in England. London: University College London

⁴⁴ Waddell, G and Burton, A.K. (2006) Is work good for health and wellbeing?, Department for Work and Pensions

£1.9bn in 2016, but nonetheless is not an insignificant level of spend in the local area, with a slight beneficial effect expected during construction.

- 12.7.94 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 although should people within the local communities' benefit, this would result in a short-term, minor beneficial health effect.
- 12.7.95 Whilst there will be some employment benefits in the local area as a result of induced spent, it is considered that the overall construction phase health related benefits would be short term, minor beneficial. 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 scheme's construction phase.

Operational phase effects

- 12.7.96 During operation the scheme would not result in any direct employment benefits beyond typical maintenance arrangements. However, the objectives for the scheme include, amongst others:
- to contribute to regeneration, development opportunities and sustainable economic growth;
 - to support employment, skills and training opportunities / legacy benefits; and
 - to improve local and strategic connectivity.
- 12.7.97 Whilst it is difficult to measure the success of these objectives, if (when) met, they will all contribute to a stronger employment market that will benefit the health of the whole community. As such, it is predicted that the scheme would result in long term, minor beneficial health effects.

Minimising the use of resources

Literature review

- 12.7.98 Reducing or minimising resource use, including waste disposal processes for construction as well as encouraging recycling at all levels can improve human health directly and indirectly by minimising environmental impact, such as air pollution⁴⁵.
- 12.7.99 Sending out waste from a development site to be sorted or disposed can increase vehicle movements, emissions and cause significant disruption including noise and dust which can contribute towards health problems for residents. See section on air quality, noise and neighbourhood amenity above for further details on the linkages to potential health effects from both air quality and dust, and noise impacts.

Construction phase effects

- 12.7.100 The **Material assets and waste** chapter of the ES (Volume 6 Document Ref 6.2 ES Chapter 10) concludes that during construction the generation of waste could

⁴⁵ HUDU (2013). HUDU Planning for Health. Rapid Health Impact Assessment Tool. (NHS) London Healthy Urban Development Unit.

result in slight/moderate adverse effects due to limited availability of waste management facilities in the region. The assessment confirms that a detailed strategy following the waste management hierarchy will be set out in the Site Waste Management Plan (SWMP) in order to reduce the amount of material that would need to be disposed of off-site.

12.7.101 In respect of resource use, **Material assets and waste** (Volume 6 Document Ref 6.2 ES Chapter 10) identifies that the import of materials may have a potential slight adverse effect on off-site secondary material sources.

12.7.102 From a health perspective, it is not considered that these impacts will result in any adverse health effects. Potential issues related to the impacts on road networks and air quality have been considered within those relevant sections of the health assessment.

Operational phase effects

12.7.103 The **Material assets and waste** chapter of the ES (Volume 6 Document Ref 6.2 ES Chapter 10) confirms that the operation of the scheme is unlikely to have any significant effects. There are therefore also not likely to be any health effects related to use of resources during this stage.

Climate change

Literature review

12.7.104 Climate change is the projected rise in global temperatures as a result of anthropogenic development which is likely to contribute to continued changes in weather patterns, rising sea levels and increased frequency and intensity of extreme weather events.

12.7.105 The UK Climate Projections (UKC09)⁴⁶ have stated that the UK should expect a shift generally towards wetter winters and a greater proportion of precipitation to fall as heavy events. There is a predicted rise in temperature and greater likelihood of drier summers has been suggested, but the various projections cover a wide range of outcomes from climate change.

12.7.106 There are direct impacts linking the environment and health such as heat-related effects, flooding and poor air quality and indirect impacts such as fuel poverty, access to green space and disruption to services and access to items such as healthy food.

12.7.107 Many of the health impacts are therefore interrelated with the health determinants and associated health impacts previously mentioned.

12.7.108 Chalmers et al⁴⁷ concluded that certain people are expected to be the most vulnerable to climate change and this includes:

- poorly housed or non-mobile individuals;
- the population living in high risk places such as flood zones and coastal locations; and
- socially isolated or those individuals otherwise unable to adapt to change.

⁴⁶ <http://ukclimateprojections.metoffice.gov.uk/21678>

⁴⁷ Chalmers H, Pilling A and Maiden T (2008) Adapting to the Differential Social Impacts of Climate Change in the UK

Construction phase effects

12.7.109 The Climate Change Resilience assessment of the ES (Volume 6 Document Ref 6.2 Chapter 14 Climate change) concludes that no significant climate change resilience effects during the construction stage have been identified. This is based on design mitigation being included such as geotechnical and drainage design and construction management practices such as those included within the Construction Environmental Management Plan (CEMP) being followed in the event of extreme weather events.

12.7.110 No health effects are therefore likely to result from climate change effects during the construction phase.

Operational phase effects

12.7.111 The A30 provides an important transport link for Cornwall and is a crucial part of the strategic road network in the region. The scheme is expected to increase the resilience of transport systems in Cornwall to a range of hazards, including climatic hazards and climate change, and hence provide benefit for the overall resilience of the region.

This increased resilience is likely to result in long-term, minor beneficial health effects as local communities will remain connected to the wider areas even during times of extreme weather, for activities such as work, recreation and access to healthcare as needed.

12.8 Mitigation and Enhancement

12.8.1 As a result of the assessment, both positive and adverse impacts have been identified which may affect the health and wellbeing of the local population. This section identifies what actions could be taken to either mitigate the adverse effects, or enhance the beneficial effects.

Table 12-7 Construction and Operation Mitigation

Health determinant	Construction mitigation	Operation mitigation
Access to healthcare services and other social infrastructure (including education)	None	None
Access to open space and nature	During construction when there will be PRow temporary diversions in place, these should be signposted clearly and information provided on the likely duration of these diversions.	Effective communication of the improvements made to the facilities for walking, cycling and horse-riding should be considered in order to ensure that local communities are made fully aware of the new/improved assets that can be utilised for accessing open space more readily and safely. In addition, consideration should be given to improving way marking for users of the improved facilities.

Health determinant	Construction mitigation	Operation mitigation
Air quality, noise and neighbourhood amenity	<p>In relation to construction noise health effects, it is recommended that a communication strategy is implemented so that local communities and residents are informed of when noisy construction activities are likely to take place and for how long. This approach can mitigate some of the adverse health effects from construction noise that can arise as a result of uncertainty in relation to noise duration. For example, if a noisy construction activity is scheduled for a few days, people may become very anxious if they are not informed before it takes place that it is likely to take place over a short, defined period only.</p> <p>In relation to air quality health effects from construction, provided the CEMP is followed, no further mitigation is recommended. In relation to landscape health effects, it is recommended that local communities are in receipt of detailed information of how the landscape relevant to them will be altered as a result of the scheme. This will reduce any anxiety related to being unsure of what is planned.</p>	<p>Once operational, it is recommended that air quality monitoring is continued in relation to NO₂ and made publically available. Landscape mitigation should be monitored to ensure that implementation of the landscape management plan is successful and where not, remediation measures employed.</p> <p>Two properties may be eligible for noise insulation under the Noise Insulation Regulations (NIR) 1975 (as amended). These are, Callestick Vean bungalow at approximate chainage 4+000.000, and Trevalso Cottage around chainage 9+600.000.</p>
Accessibility and active travel	See access to open space	See access to open space
Crime reduction and community safety	Monitoring of implementation of the CMEP should take place to make sure that it is effective and it is recommended that a contact phone number is made available for the community in case of needing to speak with the scheme construction team regarding any community safety issues that may be perceived or arise. This will facilitate good community relations, fostering trust with the local community.	None
Access to work and training	A strategy for engaging locally unemployed/ economically inactive people in construction related training should be considered in order to improve the likelihood of benefits being experienced within these communities.	None
Use of resources	None	None
Climate change	None	None

Appendix A HUDU Rapid Health Impact Assessment Matrix

	Assessment criteria	Relevant?	Details/evidence	Potential health impact	Initial considerations for the design team and further recommendations
Housing quality and design					
1.1	Does the proposal seek to meet all 16 design criteria of the Lifetime Homes Standard?	No	No housing is included in the scheme	Neutral	
1.2	Does the proposal address the housing needs of older people, i.e. extra care housing, sheltered housing, lifetime homes and wheelchair accessible homes?	No	No housing is included in the scheme	Neutral	
1.3	Does the proposal include homes that can be adapted to support independent living for older and disabled people?	No	No housing is included in the scheme	Neutral	
1.4	Does the proposal promote good design through layout and orientation, meeting internal space standards?	No	No housing is included in the scheme	Neutral	

	Assessment criteria	Relevant?	Details/evidence	Potential health impact	Initial considerations for the design team and further recommendations
1.5	Does the proposal include a range of housing types and sizes, including affordable housing responding to local housing needs?	No	No housing is included in the scheme	Neutral	
1.6	Does the proposal contain homes that are highly energy efficient (e.g. a high SAP rating)?	No	No housing is included in the scheme	Neutral	
Access to healthcare services and other social infrastructure					
2.1	Does the proposal retain or re-provide existing social infrastructure?	Yes	Social infrastructure can be broadly defined as the construction and maintenance of facilities that support social services. Roads are a type of social infrastructure.	Positive	The scheme should aim to increase accessibility to the wider community and meet the existing and projected future needs of the local community in terms of access. Consideration of how the existing A30 is used in the future should be made
2.2	Does the proposal assess the demand for healthcare services?	No	Healthcare needs/demand have not been considered as a road is not changing the population of the area.	Neutral	

	Assessment criteria	Relevant?	Details/evidence	Potential health impact	Initial considerations for the design team and further recommendations
2.3	Does the proposal include the provision, or replacement of a healthcare facility and does the facility meet NHS requirements?	No	The scheme will not result in changes to population levels and therefore would not affect healthcare services. No provision or replacement of healthcare services would therefore be required.	Neutral	
2.4	Does the proposal assess the capacity, location and accessibility of other social infrastructure, e.g. schools, social care and community facilities?	Yes	The scheme considers access to social infrastructure that exists along the existing A30 and which may be affected by the new route.	Uncertain	The scheme has the potential to affect accessibility to social infrastructure and this needs to be allowed for within the design.
2.5	Does the proposal explore opportunities for shared community use and co-location of services?	Yes	Co-location of services is not relevant to a road scheme. However, the scheme itself would be shared community use, as would the existing A30.	Positive	The existing A30 has the potential to become a community asset if it improves the local connectivity for active travel, i.e. for pedestrians, cyclists and horse riders.

	Assessment criteria	Relevant?	Details/evidence	Potential health impact	Initial considerations for the design team and further recommendations
2.6	Does the proposal contribute to meeting primary, secondary and post 19 education needs?	Yes	The scheme would not affect any education needs for primary or secondary levels. Training opportunities during construction for post 19 may arise	Positive	Consideration should be given to how training needs of post 19 could be met through opportunities on the scheme during construction.
Access to open space and nature					
3.1	Does the proposal retain and enhance existing open and natural spaces?	Yes	The scheme passes through some green/natural spaces which could be adversely affected.	Uncertain	The design should look for ways to maintain connectivity between areas the scheme passes through.
3.2	In areas of deficiency, does the proposal provide new open or natural space, or improve access to existing space?	Yes	The scheme will possibly affect access to existing natural spaces as the route cuts through green areas and potentially lead to green areas being cut off/access restricted by the scheme.	Negative	Whilst the new A30 scheme may affect access to some open spaces/green spaces, the existing A30 could be modified to improve access to existing spaces and improve opportunities for active travel.

	Assessment criteria	Relevant?	Details/evidence	Potential health impact	Initial considerations for the design team and further recommendations
3.3	Does the proposal provide a range of play spaces for children and young people?	No	Play spaces for children and young people would not be part of a road scheme	Neutral	The design for the road would not be appropriate to include play spaces for children and young people.
3.4	Does the proposal provide links between open and natural spaces and the public realm?	Yes	The road itself would act as a link between natural spaces, however, public realm is not part of the scheme and would not be appropriate.	Neutral	Opportunities for redesigning the existing A30 to improve links between open spaces within the communities it passes through could be identified. The speed of the scheme would not make it a suitable conduit for providing links between natural spaces within the communities.
3.5	Are the open and natural spaces welcoming and safe and accessible for all?	No	Design of open space into the scheme is not appropriate.	Neutral	
3.6	Does the proposal set out how new open space will be managed and maintained?	No	Design of open space into the scheme is not appropriate and therefore there is no management required	Neutral	
Air quality, noise and neighbourhood amenity					

	Assessment criteria	Relevant?	Details/evidence	Potential health impact	Initial considerations for the design team and further recommendations
4.1	Does the proposal minimise construction impacts such as dust, noise, vibration and odours?	Yes	Construction impacts would be minimised through the effective implementation of the CEMP.	Neutral	Monitor CEMP measures to ensure that they are effective in mitigating impacts. Put in place effective community liaison and response measures to deal quickly with any non-compliances or adverse impacts.
4.2	Does the proposal minimise air pollution caused by traffic and energy facilities?	Yes	Energy facilities are not relevant to the scheme. Air pollution from traffic is likely to be an issue. Reduced congestion may lead to less pollution.	Uncertain	The existing A30 could be redesigned to allow it to be more suitable for active travel such as walking and cycling which may reduce air pollution from local journeys.
4.3	Does the proposal minimise noise pollution caused by traffic and commercial uses?	Yes	Construction impacts on the noise environment would be minimised through the CEMP.	Uncertain	The proposal considers how to minimise noise pollution caused by traffic through design of the road.
Accessibility and active travel					
5.1	Does the proposal prioritise and encourage walking (such as through shared spaces)?	Yes	Footways along with scheme would not be included. However, the network of footways	Positive	The layout of the development should be designed to encourage residents to walk.

	Assessment criteria	Relevant?	Details/evidence	Potential health impact	Initial considerations for the design team and further recommendations
			along the existing A30 would be improved		
5.2	Does the proposal prioritise and encourage cycling (for example by providing secure cycle parking, showers and cycle lanes)?	Yes	No provision for cycle lanes has been made	Negative/ Positive	Consideration should be given to make better provision for cyclists on the existing A30 such that safety is improved.
5.3	Does the proposal connect public realm and internal routes to local and strategic cycle and walking networks?	Yes	Details not yet known	Unknown	The scheme should include appropriate signage to nearby local and strategic cycle/walking networks. This should be particularly considered for the existing A30.
5.4	Does the proposal include traffic management and calming measures to help reduce and minimise road injuries?	Yes	Details not yet known	Unknown	Consider the need for traffic management and calming measures, particularly on existing A30
5.5	Is the proposal well connected to public transport, local services and facilities?	Yes	The details of the proposed provision in not yet know.	Unknown	Consider how to connect the site to the wider area of Llanelli.

	Assessment criteria	Relevant?	Details/evidence	Potential health impact	Initial considerations for the design team and further recommendations
5.6	Does the proposal seek to reduce car use by reducing car parking provision, supported by the controlled parking zones, car clubs and travel plan measures?	No	The scheme is not a destination	Neutral	
5.7	Does the proposal allow people with mobility problems or a disability to access buildings and places?	Yes	The scheme would be accessible by all who can drive or use motorised transport	Positive	
Crime reduction and community safety					
6.1	Does the proposal incorporate elements to help design out crime?	Yes	Details of this are not yet known.	Unknown	The proposal should incorporate elements to help design out crime such as surveillance. Consultation should take place with the Crime Prevention Advisor.

	Assessment criteria	Relevant?	Details/evidence	Potential health impact	Initial considerations for the design team and further recommendations
6.2	Does the proposal incorporate design techniques to help people feel secure and avoid creating 'gated communities'?	No	The scheme does not in itself create a community	Neutral	
6.3	Does the proposal include attractive, multi-use public spaces and buildings?	No	Not relevant to a road scheme	Neutral	
6.4	Has engagement and consultation been carried out with the local community?	Yes	Engagement has been carried out with the local community.	Positive	Refer to Section 9 of this table for other engagement recommendations.
Access to healthy food					
7.1	Does the proposal facilitate the supply of local food, i.e. allotments, community farms and farmers' markets?	No	Not relevant to a road scheme.	Neutral	

	Assessment criteria	Relevant?	Details/evidence	Potential health impact	Initial considerations for the design team and further recommendations
7.2	Is there a range of retail uses, including food stores and smaller affordable shops for social enterprises?	No	Not relevant to a road scheme	Neutral	
7.3	Does the proposal avoid contributing towards an over-concentration of hot food takeaways in the local area?	No	Not relevant to a road scheme.	Neutral	
Access to work and training					
8.1	Does the proposal provide access to local employment and training opportunities, including temporary construction and permanent 'end-use' jobs?	Yes	Temporary job provision during the construction phase a would be provided. There are unlikely to permanent end use jobs as highways maintenance would continue to be provided as on existing A30	Positive	Consider opportunities to source local employment during construction through promotion of jobs in local job centres and schools/colleges. Include apprentice and volunteering schemes.
8.2	Does the proposal provide childcare facilities?	No	Not relevant to a road scheme	Neutral	

	Assessment criteria	Relevant?	Details/evidence	Potential health impact	Initial considerations for the design team and further recommendations
8.3	Does the proposal include managed and affordable workspace for local businesses?	No	Not relevant to a road scheme	Neutral	
8.4	Does the proposal include opportunities for work for local people via local procurement arrangements?	Yes	This level of detail is not yet known	Unknown	Local employment and the use of local suppliers during construction and operation should be promoted.
Social cohesion and lifetime neighbourhoods					
9.1	Does the proposal connect with existing communities, i.e. layout and movement which avoids physical barriers and severance and land uses and spaces which encourage social interaction?	Yes	The scheme provides for opportunities for improving the local facilities for walking, cycling and horse riding, e.g. by making facilities safer	Positive	Consideration should be made to connecting the facilities to the wider networks in the area

	Assessment criteria	Relevant?	Details/evidence	Potential health impact	Initial considerations for the design team and further recommendations
9.2	Does the proposal include a mix of uses and a range of community facilities?	No	Not relevant to a road scheme	Neutral	N/A
9.3	Does the proposal provide opportunities for the voluntary and community sectors?	No	Not relevant to a road scheme	Neutral	N/A
9.4	Does the proposal address the principles of Lifetime Neighbourhoods?	No	Not relevant to road schemes	Neutral	N/A
Minimising the use of resources					
10.1	Does the proposal make best use of existing land?	Yes	The scheme mainly uses greenfield land.	Unknown	The use of greenfield land is not necessarily negative to health if access to remaining open spaces is improved. Consideration should be given to access and connectivity
10.2	Does the proposal encourage recycling (including building materials)?	Yes	These details are not yet known	Unknown	The design should encourage use of recycled material

	Assessment criteria	Relevant?	Details/evidence	Potential health impact	Initial considerations for the design team and further recommendations
10.3	Does the proposal incorporate sustainable design and construction techniques?	Yes	The details of this are not yet known	Unknown	Design team should include local sourcing, embodied energy and waste minimisation in appraisal of construction materials. The sourcing and transport of trees and planting should, where possible, minimise travel distance and consider sustainability credentials of source.
Climate change					
11.1	Does the proposal incorporate renewable energy?	Yes	It is currently unknown what the energy source will be during construction.	Positive	The scheme should incorporate energy efficiency measures in construction practices.
11.2	Does the proposal ensure that buildings and public spaces are designed to winter and summer temperatures, i.e. ventilation, shading and landscaping?	No	Not relevant to road schemes	Neutral	N/A

	Assessment criteria	Relevant?	Details/evidence	Potential health impact	Initial considerations for the design team and further recommendations
11.3	Does the proposal maintain or enhance biodiversity?	Yes	Habitat replacement would be provided for important and notable habitats and species. New road crossings for species would be provided at strategic locations along the scheme to allow for safe passage of animals (to ensure connectivity). Habitats would include grasslands, heathland, hedgerows and woodlands designed to benefit bats, badgers, otters and reptiles.	Unsure	Planting choices/landscaping proposals should create attractive spaces for communities to enjoy. Create natural spaces for educational purposes e.g. bat and bird boxes, or bug homes/inset boxes etc. Avoid plants with poisonous berries that may create health hazards for small children. Ensure monitoring is in place from the outset
11.4	Does the proposal incorporate urban drainage techniques?	Yes	The highway drainage will consist of filter drains and surface water channels, with kerb and gully systems where necessary. The highway drainage will be designed to cater for a 1 in 1 year return period event without surcharging and will ensure that there is no surface water flooding	Unknown	Review should be made on potential for water attenuation with permeable surfacing and a fully integrated SUDs system.

	Assessment criteria	Relevant?	Details/evidence	Potential health impact	Initial considerations for the design team and further recommendations
			for a 1 in 5 year return period event.		

Appendix B Community Health and Wellbeing Profile

B.1 Introduction

- B.1.1.1 The community health and wellbeing profile focuses on population demographics, socio-economic status and community health.
- B.1.1.2 The purpose of the health profile is to give a picture of the health and social-demographic context of the scheme in order to understand any potential health impacts and the particular population groups that may be affected. The profiling has involved collecting and analysing secondary (existing) data on a number of indicators that relate to the content and context of the scheme, and its possible impacts on health or health determinants. Indicators are measurable variables that reflect the state of a community or of persons or groups in a community.

B.2 Population

- B.2.1.1 The county has a total population of approximately 555,100 (48.5% male), of whom 58.9% are between the ages of 16-64. By comparison, 63.1% of the total population of England is aged 16-64.
- B.2.1.2 Outside of Truro and some other towns of Falmouth, Camborne, Penzance and Newlyn and St Austell, Cornwall is predominantly rural, with a population density of 1.5 persons per hectare⁴⁹, which compares to an England average population density of 4.1 persons per hectare.
- B.2.1.3 The population of Cornwall has been gradually increasing and changing demographically. Whilst there has been a decline amongst younger age groups 0-39, older groups have been increasing in size with the largest group being the 40-54 age band accounting for 21.2% of the population with an overall increase of 50.96% since 1951¹.

B.2.2 Ethnicity

- B.2.2.1 Cornwall is less ethnically diverse than much of the rest of the UK having 98.1% white compared to 85.3% across England. In the 2011 census the following ethnic groups were identified, compared with the regional and England statistics. The ethnic diversity at the relevant ward level is also similar to the Cornwall statistics.

⁴⁸ ONS, 2016 midyear estimates

⁴⁹ ONS (2012), Census 2011

Table 12-8 Ethnic diversity

	Cornwall (Total and %)	South West (Total and %)	England (Total and %)
White	522,213 (98.1%)	5,040,798 (95.3%)	45,226,247 (85.3%)
Gypsy/Traveller/Irish Traveller	635 (0.1%)	5,631 (0.1%)	54,895 (0.1%)
Mixed/ multiple ethnic groups	4,400 (0.8%)	71,884 (1.4%)	1,192,879 (2.3%)
Asian / Asian British: Indian	837 (0.2%)	34,188 (0.6%)	1,395,702 (2.6%)
Asian / Asian British: Pakistani	107 (<0.1%)	11,622 (0.2%)	1,112,282 (2.1%)
Asian / Asian British: Bangladeshi	280 (0.1%)	8,416 (0.2%)	436,514 (0.8%)
Asian / Asian British: Chinese	1,004 (0.2%)	22,243 (0.4%)	379,503 (0.7%)
Asian / Asian British: Other Asian	1,206 (0.2%)	29,068 (0.5%)	819,402 (1.5%)
Black / African / Caribbean / Black British	762 (0.1%)	49,476 (0.9%)	1,846,614 (3.5%)
Other Ethnic Group	829 (0.2%)	15,609 (0.3%)	548,418 (1%)

B.2.3 Religion

B.2.3.1 The 2011 census identified the religious make up of Cornwall as 59.8% Christian, 29.7% No religion, 0.3% Buddhist, 0.2% Muslim, 0.1% Hindu, 0.1% Agnostic, 0.1% Jewish, 0.1% Atheist.

B.3 Housing and household composition

B.3.1.1 Across Cornwall there are 230,346 households of which 68.8% are owner-occupied. The proportion of households that are social rented is 12%².

B.3.1.2 In the Cornwall Local Plan, the Community Neighbourhood Area (CNA) of St Agnes and Perranporth, under which part of the scheme falls, aims to develop 1,100 dwellings before 2030, of which 490 had already been completed at the time of writing the Strategic Policies Document in 2014. The remaining section falls under the CNA of Truro and Roseland, which aims to develop 3,900 dwellings before 2030.

B.3.1.3 The rate of one person households is 30.1%, (14.8% are people 65 and over). Lone parent families with dependent children make up 5.7 % of households in Cornwall; 36.2% of these are not in any employment. 1.6% of the resident population of Cornwall live a communal establishment that offers medical care (e.g. care home, hospital)².

B.4 Economic and Employment Activity

B.4.1 Adult economic activity rate

B.4.1.1 Employment statistics for Cornwall show that the proportion of economically active people is similar to the national average. However, at ward level there is more variability with only Perranporth ward having a lower proportion of economically active people than the national average.

B.4.1.2 The percentage of economically active people who are unemployed in the wards adjacent to the scheme is lower than the both the national and regional average. Economic inactivity is also lower in these adjacent wards than the regional average. These statistics indicate that the local economy is more buoyant than the region as a whole.

Table 12-9 Employment statistics for Cornwall and wards adjacent to the scheme⁵⁰

	Cornwall	Great Britain	Ladock, St Clements and St Erme	Chacewater & Kenwyn	Perranporth	Newlyn & Goonhavern	St Agnes
Residents Aged 16-74 (2013)⁵¹	324,900 (60%)	63.8%	2,893	2,498	2,464	2,941	2,785
Economically Active³	263,700 (76.4%)	76.8%	2,275 (81.7%)	1,968 (79.3%)	2,081 (73.2%)	2,379 (80.2%)	2,169 (80.1%)
In employment	244,600 (70.6%)	70.1%	2,163 (77.7%)	1,890 (76.2%)	1,974 (74.9%)	2,265 (76.4%)	2,067 (76.3%)
Unemployed	16,800 (6.4%)	7.8%	112 (4.9%)	78 (4%)	107 (5.1%)	114 (4.8%)	102 (4.7%)
Economically Inactive³	(23.9%)	22.9%	509 (18.3%)	513 (20.7%)	556 (21.1%)	587 (19.8%)	540 (19.9%)

B.4.2 Key sector employment

B.4.2.1 Data for the proportion of enterprises by broad industrial sector shows that Cornwall is fairly similar to the national average for each sector. However, at the more granular ward level, agriculture, construction, accommodation and food service activities have a higher than England average. In particular, it is noticeable that human health and social work activities is significantly higher at the local level than at the England level. Professional, scientific and technical activities (typically higher earning), along with administrative and support services is significantly less represented in Cornwall than the rest of England. The breakdown for each of these industries in each of the relevant wards, Cornwall and England is set out in Table 12-10.

⁵⁰ Nomis, 2011 data.

⁵¹ Nomis 2013 data. Whilst there is 2017 data for Cornwall, this is not available at ward level.

Table 12-10 Workforce jobs by industry sector, 2011⁵².

Geography	Ladock, St Clement s	Chacewa ter & Kenwyn	Perranp orth	Newlyn & Goonhav ern	St Agnes	Cornwall	England
Measure	%	%	%	%	%	%	%
All categories: Industry	100	100	100	100	100	100.0	100.0
A Agriculture, forestry and fishing	5.4	4.2	2.2	3.7	1.5	3.0	1.1
B Mining and quarrying	0.4	0.2	0.4	0.3	0.3	0.7	0.1
C Manufacturing	4.9	6.6	5.0	5.7	5.1	7.9	8.1
D Electricity, gas, steam and air conditioning supply	0.2	0.3	0.2	0.1	0.4	0.4	0.3
E Water supply; sewerage, waste management and remediation activities	0.9	0.7	0.3	0.3	0.6	0.8	0.6
F Construction	9.4	9.0	10.2	10.1	8.9	9.0	6.3
G Wholesale and retail trade; repair of motor vehicles and motor cycles	15.1	16.7	14.1	15.5	13.8	16.8	15.1
H Transport and storage	4.0	4	3.7	3.5	2.2	3.7	4.8
I Accommodation and food service activities	6.1	4.8	10.5	10.9	7.6	9.2	6.3
J Information and communication	3	2.9	2.1	1.6	3.2	1.7	4.2
K Financial and insurance activities	2	1.5	1.5	1.9	1.2	1.5	3.7
L Real estate activities	1.6	1.5	1.3	1.5	1.2	1.4	1.5
M Professional, scientific and technical activities	5.8	5.2	4.9	5.6	6.0	4.7	8
N Administrative and support service activities	4.7	3.8	3.9	4.5	3.7	4.3	8
O Public administration and defence; compulsory social security	5.6	5.3	4.3	4.7	6.2	6.3	4.9
P Education	10.2	8.6	10.4	10.1	11.1	9.7	8.7
Q Human health and social work activities	15.8	20.4	20.1	14.2	21.9	13.5	12.3

⁵² Nomis, 2011 data

R, S, T, U Other	4.6	4.3	4.9	5.6	5.1	5.3	6
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B.5 Education

B.5.1.1 As a whole, Cornwall has similar educational achievement as the rest of England and Wales, although there are slightly lower levels of Level 4 qualifications and above (26.9% compared to 29.7%). Within the wards directly adjacent to the scheme attainment of Level 4 qualifications is higher than the England average. This is reflected by the levels of people with no qualifications in these wards, i.e. they are all below the national and regional average of 22%. Table 12-11 provides a breakdown of educational attainment within the relevant wards, Cornwall and England.

Table 12-11 Educational attainment (2011)⁵³

Highest level of qualification	Ladock, St Clements	Chacewater & Kenwyn	Perranport h	Newlyn & Goonhavern	Cornwall	England
	%	%	%	%	%	%
No qualifications	16	19	20	20	22	22.5
Level 1 qualifications	14	12	11	13	13	13.3
Level 2 qualifications	19	17	15	17	17	15.2
Apprenticeship	4	4	5	5	5	3.6
Level 3 qualifications	14	12	12	14	13	12.4
Level 4 qualifications and above	30	32	32	27	25	27.4
Other qualifications	4	4	4	4	4	5.7

B.6 Health

B.6.1 Personal well-being

B.6.1.1 Self-reported well-being status of people within the UK is now measured by the Office of National Statistics. Both nationally and in Cornwall, life satisfaction has increased although only marginally.

B.6.1.2 In 2016-17 the self-reported personal well-being status of people in Cornwall showed that overall life satisfaction in Cornwall is good. A total of 80.4% of residents' report having between very high and high life satisfaction, whilst 14.8% report having

⁵³ ONS, Census 2011

medium life satisfaction and 4.7% having low life satisfaction. Table 12-12 below shows the average life satisfaction ratings where 10 is the most satisfied for Cornwall and England over a number of years.

Table 12-12 Personal well-being – self reported, 2011-2017⁵⁴

	Average (mean) ratings					
	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Life satisfaction						
England	7.41	7.44	7.50	7.60	7.64	7.68
Cornwall	7.73	7.65	7.73	7.70	7.78	7.82
Worthwhile						
England	7.66	7.69	7.74	7.82	7.83	7.86
Cornwall	7.93	7.88	7.97	7.92	7.96	7.88
Happiness						
England	7.29	7.29	7.38	7.46	7.47	7.51
Cornwall	7.60	7.46	7.49	7.47	7.61	7.59
Anxiety						
England	3.14	3.04	2.93	2.86	2.87	2.91
Cornwall	2.96	2.94	2.89	2.90	2.81	2.63

⁵⁴ ONS, Personal well-being estimates (<https://www.ons.gov.uk/peoplepopulationandcommunity/wellbeing/datasets/headlineestimatesofpersonalwellbeing>)

B.6.2 Self-reported health

- B.6.2.1 Self-reported health status was measured in the 2011 census. Over three quarters of the population in Cornwall (419,564) identified their health as 'good' which represents an increase of 12.6% in the population who identified their health as 'good' between 2001 and 2011.
- B.6.2.2 There were 33,528 people in Cornwall who identified their health as 'bad' in 2011 equating to 6.3% of the population. In 2001 48,806 or 9.9% identified their health as 'bad' meaning a fall of 3.6% between 2001 and 2011.

B.6.3 Child health

- B.6.3.1 In Year 6 (age 10-11), 17.1% (808) of children are classified as obese, better than the average for England⁵⁵. The rate of alcohol specific hospital stays among those under 18 was 46.5⁵⁶, worse than the average for England. This represents 49 stays per year.

B.6.4 Carers

- B.6.4.1 In Cornwall in 2011, 11.9% of people undertook unpaid care every week compared to 11.3% in 2001 this is an additional 7,612 carers. The percentage of the population in Cornwall who provided unpaid care for 50+ hours per week rose to 3% (15,856) in 2011; this is an increase of 2,737 people from 2001⁵⁷. These numbers are higher than the national average.

B.7 Deprivation

- B.7.1.1 Deprivation is measured by Lower Super Output Area (LSOA) rather than by ward. The Indices of Multiple Deprivation 2015 data show that Cornwall is now ranked 143 out of 326 local authority areas for deprivation (where 1 is having the highest proportion of the population living in the most deprived neighbourhoods). The 2010 data showed that Cornwall ranked 154 which suggests deprivation in Cornwall has increased.
- B.7.1.2 The areas that cover the wards adjacent to the scheme are not in the most deprived areas within the county.

⁵⁵ Public Health England. Cornwall Health Profile 2016

⁵⁶ Rate per 100,000 population

⁵⁷ ONS, 2011 – Census at a glance, Cornwall

B.8 Tourism and recreation

B.8.1.1 There are a number of tourist and recreational facilities located within the study area and which can be accessed by the existing A30. These include:

B.8.2 Camping and caravanning sites

B.8.2.1 Trevarth Holiday Park (approximately 435m south west of the Chiverton Cross roundabout), Summer Valley Touring Park (approximately 1km south east of Allet, accessed from the B3284), Chiverton Caravan and Touring Park (approximately 530m south west of the Chiverton Cross roundabout) and Marazan Farm Campsite (approximately 70m south east of the existing A30 at Marazanvose).

B.8.3 Accommodation

B.8.3.1 Plume of Feathers (approximately 1.4km north east of the Carland Cross roundabout, in Mitchell), Goonwinnow Farm (approximately 1km north of the Carland Cross roundabout), Pure Cornwall Ltd (approximately 900m north east of the Chiverton Cross roundabout, between the A3075 and the A30), Fair View Farm (approximately 1.2km south east of the A30 in Allet, accessed from the B3284), Chiverton Arms (approximately 250m west of existing Chiverton Cross roundabout, Little Callestock Farm and Callestock Courtyard Cottages (approximately 1km north west of the A30 at Zelah).

B.8.4 Equestrian centres

B.8.4.1 Colrairie Equestrian Centre (approximately 1.4km north of the A30 at Callestick Vean), Chiverton Riding Centre (approximately 500m north west of the Chiverton Cross roundabout) and Chyverton Park Equestrian Centre (approximately 475m north west of the A30 at Marazanvose)

B.8.5 Recreational facilities

B.8.5.1 Healey's Cornish Cider Farm (approximately 1.8km north of the A30 at Callestick Vean), Llama Lland (1.6km south east of the A30 at Marazanvose).

B.8.6 Public houses and restaurants

B.8.6.1 Callestick Farm Tearoom (approximately 1.7km north of the A30 at Callestick Vean), NFH 9200m east of the A30 at Marazanvose), The Hawkins Arms (150m west of the A30 at Zelah, accessed from Herver Lane) and the Chiverton Arms⁵⁸ (300m east of the Chiverton Cross roundabout).

B.8.7 Access to vehicles and commuting patterns

B.8.7.1 17.7% of households in Cornwall do not have a car or van⁵⁹. This is less than the England average of 25% of households who don't have access to a car or van and may be representative of the more rural nature of large parts of Cornwall.

B.8.7.2 In the 2011 census, 37.8% of people commute to work by driving a car or van, 3.2% by being a passenger in a car or van, 1% by bicycle, 7.4% on foot. This compares to the England average of 34.9%, 3.2%, 1.9% and 6.3% respectively.

⁵⁸ Also a B&B hotel

⁵⁹ ONS (2012), Census 2011.

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