M5 Junction 10 Improvements Scheme

Environmental Statement

Chapter 13: Population and Human Health

TR010063 – APP 6.11

Regulation 5 (2) (a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

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M5 Junction 10 Improvements Scheme

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6.11 Environmental Statement:

Chapter 13: Population and Human Health

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13. Population and Human Health

13.1. Introduction

13.1.1. This chapter presents the environmental assessment of the M5 Junction 10 Improvements Scheme (the Scheme) for Population and Human Health based on the Scheme as it is described in Chapter 2 – The Scheme (application document TR010063/APP/6.2) and detailed in the General Arrangement Plans (application document TR010063/APP/2.9).

13.1.2. The Infrastructure Planning (EIA) Regulations 2017, specifically Regulation 5(2)(a), requires Environmental Statements to include, inter alia, assessment of likely effects upon population and human health. The EIA Regulations 2017 do not establish the way in which the topic is to be addressed and there is no prescribed EIA definition for 'population and human health'. This chapter has therefore been prepared in accordance with best practice, professional judgement, the standard from National Highways as it is set out in the Design Manual for Roads and Bridges (DMRB)1: The standard for the Population and Human Health assessment is contained within DMRB LA112. The standard for determining the significance of effects as a product of cross-referencing sensitivity to magnitude of impacts is provided in DMRB LA104.

13.1.3. A Scoping Report was prepared, which included the proposed methodology for the Population and Human Health assessment, as noted above. A response to the Planning Inspectorate's Scoping Opinion on the proposed scope of the population and human health assessment is provided in Scoping Opinion Responses (application document TR010063/APP/6.15). Consultation with wider stakeholders was also undertaken on the Scoping Report. In response to consultation comments, the Institute of Environmental Management and Assessment (IEMA) guidance on scoping human health[2] and assigning significance in human health EIA[3] has also been used to complement the DMRB methodology in evaluating wider environmental, social, and economic aspects considered relevant to the human health assessment.

13.1.4. The Population and Human Health assessment reports on the likely effects on people living and working in the Scheme area, and the opportunities for improving health and reducing inequalities, in relation to the construction of the Scheme, and when it is open. The assessment of impacts on the population focuses on effects of the Scheme and the consideration of human health explores possible health outcomes due to the Scheme. The assessment draws conclusions about the likely significance of population effects and human health outcomes arising from the Scheme – DMRB standard has been used to report on the significance of population effects; and principles from the IEMA guidance on human health significance has been used to supplement the human health outcomes such that significance is also assigned.

13.1.5. This chapter opens with an overview of the key planning policy and legislation of relevance to Population and Human Health, which informs the assessment presented within this chapter. The chapter provides an introduction to the general methodology for collating baseline information, determining sensitivity, identifying impacts and assessing the effects of the Scheme. It also highlights aspects of the assessment where consultation, undertaken during the progression of the Scheme, has informed the Environment Statement (ES) assessment findings.

13.1.6. The chapter includes an assessment of the effect of the Scheme on agricultural land holdings and associated infrastructure, but not agricultural soils and land quality. The

[1] DMRB LA 1112 Population and human health. 2020. Available at: https://www.standardsforhighways.co.uk/dmrb/search/1e13d6ac-755e-4d60-9735-f976bf64580a [Accessed on: 22/11/2022]
[2] Pyper, R., Lamming, M., Beard, C., Waples, H., Birley, M., Buroni, A., Douglas, M., Turton, P., Hardy, K., Netherton, A., McClenaghan, R., Barratt, T., Bhatt, A., Fenech, B., Dunne, A., Hodgson, G., Gibson, G., Purdy, J., Cave, B. (2022) IEMA Guide: Effective Scoping of Human Health in Environmental Impact Assessment.
[3] Pyper, R., Waples, H., Beard, C., Barratt, T., Hardy, K., Turton, P., Netherton, A., McDonald, J., Buroni, A., Bhatt, A., Phelan, E., Scott, I., Fisher, T., Christian, G., Ekermawi, R., Devine, K., McClenaghan, R., Fenech, B., Dunne, A., Hodgson, G., Purdy, J., Cave, B. (2022) IEMA Guide: Determining Significance for Human Health in Environmental Impact Assessment.

latter are assessed in Chapter 10 - Geology and Soils (application document TR010063/ APP/6.8).

13.1.7. In terms of the population aspect of the chapter, the Scheme has been assessed against the following aspects, as set out in DMRB LA112:

- Private property and housing.
- Community land and assets.
- Development land and local businesses.
- Agricultural land holdings.
- Walkers, cyclists, and horse-riders (WCH).

13.1.8. The human health assessment explores the impacts of the Scheme on determinants of human health. Potential determinants of human health appear in the IEMA guidance in the format reproduced in Figure 13-1 and as the following list in the DMRB standard:

- The location and type of community, recreational and education facilities, and severance/separation of communities from such facilities.
- The location of green/open space and severance/separation of communities from such facilities.
- The location of healthcare facilities and severance/separation of communities from such facilities.
- Outline spatial characteristics of the transport network and usage in the area, including the surrounding road network, Public Rights of Way (including bridleways), cycle ways, non-designated public routes and public transport routes.
- Air quality management areas and ambient air quality.
- Areas recognised as being sensitive to noise and the ambient noise environment.
- Sources and pathways of potential pollution.
- Landscape amenity.
- Safety information associated with the existing affected road network.
- Where available, information collated from stakeholder consultation.

13.1.9. These determinants have been reviewed and considered in the context of the Scheme to identify those of relevance to the study area context.

13.1.10. For the purposes of reporting, the assessment considers the impacts of the Scheme on the relevant determinants of health. It then assesses how the changes in determinants of health may manifest in health outcomes and effects for specific human health receptors.

Table 5.1: EIA wider determinants of health to scope (not exhaustive)

Categories	Wider determinants of health
Health related behaviours	physical activity
	risk taking behaviour
	diet and nutrition
Social environment	housing
	relocation
	open space, leisure and play
	transport modes, access and connections
	community safety
	community identity, culture, resilience and influence
	social participation, interaction and support
Economic environment	education and training
	employment and income
Bio-physical environment	climate change mitigation and adaptation
	air quality
	water quality or availability
	land quality
	noise and vibration
	radiation
Institutional and built environment	health and social care services
	built environment
	wider societal infrastructure and resources

Figure 13-1 - Wider determinants of health listed in the IEMA guidance (Source: Table 5.1 IEMA 2022[4])

13.2. Competent expert evidence

13.2.1. This assessment has been undertaken and reported by a team of competent population and human health practitioners. The competent expert responsible for the assessment is an Associate Director, chartered member of the Royal Town Planning Institute (RTPI) who has an MA in Town and Country Planning and over 20 years of relevant experience. This includes undertaking strategic environmental assessment (SEA), sustainability appraisal (EA), integrated impact assessment (IIA) and EIA work for strategic plan making and major infrastructure and linear projects, including highways, for which the processes of EIA or SA/SEA have been required, including consideration of social effects, encompassing equality and health.

13.3. Planning policy and legislative context

13.3.1. Legislation, national and local policy has been reviewed to identify references and direction on relevant issues. This includes transport and land use and the way in which national road networks are cited as having the potential to affect health, well-being, and quality of life.

13.3.2. There is no legislation nor policies specifically relating to assessment of impacts on agricultural holdings in the context of the Population and Human Health assessment. Those policies designed to protect best and most versatile (BMV) land are summarised in Chapter 10 – Geology and Soils (Application document TR010063/APP/6.8).

13.3.3. The National Policy Statement for National Networks (NPS NN) is directly relevant to highway infrastructure projects on the national road network that are defined as Nationally Significant Infrastructure Projects (NSIP). The NPS NN is described as setting out

[4].Pyper, R., Waples, H., Beard, C., Barratt, T., Hardy, K., Turton, P., Netherton, A., McDonald, J., Buroni, A., Bhatt, A., Phelan, E., Scott, I., Fisher, T., Christian, G., Ekermawi, R., Devine, K., McClenaghan, R., Fenech, B., Dunne, A., Hodgson, G., Purdy, J., Cave, B. (2022) IEMA Guide: Determining Significance for Human Health in Environmental Impact Assessment

Government's planning policies for decisions on NSIPs (Annex D: Overview of Development Process). The Scheme falls within the definition of an NSIP, making the NPS NN the primary planning policy against which an application for a DCO for the Scheme would be judged. Table 13-1 identifies the NPS NN policies relevant to population and human health, which have been used to guide the assessment and the identification of appropriate mitigation and enhancement measures.

13.3.4. Table 13-2 presents the national, regional, and local legislative and policy framework of most relevance to the assessment. The review has guided the design of the Scheme and allowed consideration of appropriate mitigation.

13.3.5. It should be noted that the contents of Table 13-1 and Table 13-2 are not intended to provide a full consideration of the relevant documents and their application to the Scheme. This information is provided within the Planning Statement and Schedule of Accordance with National Policy Statement (Application document TR010063/APP/7.1) that accompanies the application for a DCO.

Table 13-1 – Relevant NPS NN policies for population and human health assessment

Relevant NPS NN Chapter	Paragraph reference	Requirement of NPS NN
Chapter 2 – The Need for the Development	2.23	The summary of need sets out the Government's vision and strategic objectives for the national networks. These include improving overall quality of life, journey quality, reliability and safety and linking up communities. The Government's wider policy is to bring forward improvements and enhancements to the existing Strategic Road Network. This includes junction improvements, dualling of single carriageway strategic trunk roads and additional lanes on existing dual carriageways to increase capacity and to improve performance and resilience.
	2.6	Paragraph 2.6 states there is a "need for national networks to support national and local economic growth and regeneration, particularly in the most disadvantaged areas".
Chapter 3 – Wider Government Policy on the national networks	3.2/3.3	Paragraph 3.2 establishes that to be sustainable, new schemes should improve quality of life. Paragraph 3.3 sets the Government expectation that Applicants should avoid and mitigate environmental and social impacts in line with the principles set out in the National Planning Policy Framework (NPPF). Furthermore, paragraph 3.19 states that schemes will be expected to improve accessibility and inclusivity and reduce community severance, to contribute to a network that provides a range of opportunities and choices for people to connect with jobs, services and friends and family.
	3.17	Paragraph 3.17 expects national road schemes within reason to address the needs of pedestrians and cyclists. Paragraph 3.17 states that schemes are expected *"to identify opportunities to invest in infrastructure in locations where the national road network severs communities and acts as a barrier to cycling and walking, by correcting historic problems, retrofitting the latest solutions and ensuring that it is easy and safe for cyclists to use junctions."*
	3.1-3.21	The Government's wider policy commits to creating more accessible and inclusive transport networks to allow for opportunities and choices for people to connect with jobs, services, and people (paragraph 3.19). The NPS NN emphasises the requirement to consider the needs for who are disabled or have reduced mobility in line with the Government's strategy *Transport for Everyone: an action plan to improve accessibility for all* (paragraph 3.20) and obligations under the Equalities Act 2010 (paragraph 3.21). Paragraph 3.20 also requires proposals to consider the accessibility requirements for all who use or are affected by national infrastructure, and opportunities to deliver accessibility improvements to the existing road network where appropriate.
	3.22	Severance is covered in paragraph 3.22 which outlines *"Where appropriate applicants should seek to deliver improvements that reduce community severance and improve accessibility".*
Chapter 4 – Health	4.64-4.66	The NPS NN states that a Scheme should align with the Highway Agency's Safety Framework for the Strategic Road Network and with the national *Strategic Framework for Road Safety* (paragraph 4.64). All steps should be taken to *"minimise the risk of*

Relevant NPS NN Chapter	Paragraph reference	Requirement of NPS NN
		road causalities arising from a Scheme and contribute to an overall improvement in the safety of the Strategic Road Network." Paragraphs 4.64 and 4.65 outline the steps which should be shown to reasonably been taken to: • *"minimise the risk of death and injury arising from their development;* • *contribute to an overall reduction in road casualties;* • *contribute to an overall reduction in the number of unplanned incidents; and* • *contribute to improvements in road safety for walkers and cyclists".* As well as: • consider the safety implications of their project from the outset; and • put in place rigorous processes from monitoring and evaluating safety.
Chapter 4 – Health Chapter 5 – Generic Impacts	4.79-4.80 5.186 / 5.195	It is acknowledged in the NPS NN that new or enhanced national networks infrastructure can have direct (paragraph 4.79) and indirect (paragraph 4.80) impacts on health, well-being and the quality of life of the population. Specific note is made of the connections to human health from increased emissions (paragraph 5.3), waste management and disposal practices (paragraph 5.39), excessive noise (paragraphs 5.186 and 5.195) and pollutants within the water environment (paragraph 5.219). Although it does not provide specific guidance for Population and Human Health impacts, the NPS NN outlines the approach to land use that is of relevance to this assessment. Applicants should identify existing and proposed land uses, including best and most versatile agricultural land, near the Scheme and the likely effects on these (Paragraphs 5.165 and 5.168).
Chapter 4 – Health	4.81/4.82	NPS NN states that (paragraph 4.81) where a proposed project has likely significant environmental impacts that would have an effect on human beings, any environmental statement should identify and set out the assessment of any likely significant adverse health impacts. NPS NN states that the Applicant should identify measures to avoid, reduce or compensate for adverse health impacts as appropriate (paragraph 4.82). It also asserts that as these impacts may affect people simultaneously, the Secretary of State (in determining an application for development consent) should consider the cumulative impact on health.
Chapter 5 – Generic Impacts	5.115; 5.162; 5.166 and 5.184.	NPS NN seeks to protect *"existing open space, sports and recreational buildings and land from development unless land is surplus to requirements or the loss would be replaced by equivalent or better provisions in terms of quantity and quality in a suitable location".* Development should have regard to any local authority assessment of need for types of land and buildings (Paragraph 5.166). Access to high quality open spaces, Public Rights of Way (PRoW), the countryside and opportunities for sport and recreation can be a means of providing mitigation and/or compensation requirements for developments (Paragraphs 5.162 and 5.184). Paragraph 5.115 states that opportunities *"to use open space for multiple purposes such as amenity, wildlife habitats and flood storage uses"* should be considered where appropriate.

Table 13-2 – Legislation, regulatory and policy framework for population and human health

Scale	Document	Summary of Requirements
National	Countryside and Rights of Way Act 2000	The Countryside and Rights of Way Act 2000 (CRoW) regulates all PRoW and ensures access to them. It requires local highway authorities to publish a Rights of Way Improvement Plan (RoWIP), which should be reviewed every 10 years. CRoW also obliges the highway authority to recognise the needs of the mobility impaired when undertaking improvements.
National	Health and Social Care Act 2012	This is a wide-ranging piece of legislation that places a duty of care to protect and improve public health on the Secretary of State for Health, as well as other bodies directed by the Secretary of State for Health such as local authorities, including Directors of Public Health, and the NHS (Sections 11. 12, 18, 22, 20, 31 and 60).
National	Equality Act 2010	The Equality Act 2010 legally protects people from discrimination in the workplace and in wider society. It establishes who is protected from discrimination, defines different types of discrimination, and explains the different ways in which it is unlawful to treat someone. The Equality Duty on the public sector emerged as a provision of the Equality Act in April 2011. This means that all public bodies must consider all individuals when carrying out their day-to-day work, which includes in shaping policies and in delivering services. Of particular relevance in the need for public bodies to have due regard to the need to foster good relations between different people when carrying out their activities.
National	National Planning Policy Framework (NPPF, 2021)	The NPPF provides policies for local authorities developing local plans and is the basis for decisions in the absence of a local plan (NPS NN Annex D: Overview of Development Process). The NPPF establishes national planning policy to achieve sustainable development, through themes that include promoting sustainable transport, supporting a prosperous rural economy, and promoting healthy communities, with a presumption in favour of sustainable development. Given that the Scheme is an NSIP, the NPPF is not the basis for decision making; however, it provides a contextual reference and is cited in the NPS NN as an important and relevant consideration (NPS NN paragraph 1.18). Paragraph 81 states that planning decisions should help create the conditions in which 'businesses can invest, expand and adapt.' Furthermore, planning policies and decisions should aim to achieve healthy, inclusive, and safe places that: • Promote social interaction. • Are safe and accessible. • Enable and support healthy lifestyles. Paragraph 99 recognises that access to a network of high-quality open spaces and opportunities for sport and physical activity is important for the health and well-being of communities. As such, 'existing open space, sports and recreational buildings and land, including playing fields, should not be built on.'

Scale	Document	Summary of Requirements
		Paragraph 83 notes local shops, meeting places, sports venues, open space, cultural buildings, public houses and places of worship within the category of community facilities (particularly within the rural context, which is relevant to parts of the study area). Paragraph 112 encourages walking, cycling and public transport use. Applications for development should, inter alia: • 'give priority first to pedestrian and cycle movements, both within the Scheme and with neighbouring areas'. • 'address the needs of people with disabilities and reduced mobility in relation to all modes of transport'. • 'create places that are safe, secure and attractive – which minimise the scope for conflicts between pedestrians, cyclists and vehicles.'
National	Public Health England (PHE) Strategy 2020-2025	The PHE Strategy aims to both protect good health and help people live longer in good health. The strategy focuses on reducing inequalities and improving outcomes so that by 2025 England is healthier, safer, fairer, and stronger. The PHE Strategy cites ten priorities. The priorities that have greatest relevance to the Scheme in terms of matters that could be more directly influenced are as follows: • Creating cleaner air. • Better mental health. • Effective responses to major incidents.
National	Public Health Outcomes Framework	The Public Health Outcomes Framework comprises indicators that are intended to help health and care professionals and the public to understand trends in public health. The indicators seek to translate the national vision and targets for public health, focusing on improvement and protection. Relevant target indicators include: reducing killed and seriously injured casualties on England's roads; reducing the percentage of the population affected by noise; increasing utilisation of outdoor space for exercise/health reasons; increasing the proportion of physically active adults; reducing the fraction of mortality attributable to particulate air pollution; reducing mortality rate for causes considered preventable; and reducing numbers of 16-18 year olds not in education, employment or training.
Regional	Gloucestershire Local Transport Plan (LTP) (2020-2041)	The Gloucestershire LTP sets the strategic transport vision for the County to 2041. The plan sets out the overarching and modal policies that support the spatial Connecting Places Strategies (CPS) and the Transport Scenarios, looking to 2041. It is a material consideration for the Scheme, given its status as an NSIP.

Scale	Document	Summary of Requirements
		Paragraph 2.3.1 states that Gloucestershire's vision for transport is 'a resilient transport network that enables sustainable economic growth by providing travel choices for all, making Gloucestershire a better place to live, work and visit.' Paragraph 2.3.4 goes on to state that a key objective of the LTP is to 'improve community health and wellbeing and promote equality of opportunity.' Policy LTP PD 0.5 Community Health and Wellbeing ensures that people from all social and economic groups and those with disabilities are encouraged to use safe and affordable multi-modal travel options. Furthermore, there is a focus on 'improving air quality; and connecting people to services, employment, housing, education, health services, social and leisure amenities to allow equality of opportunity to health, social and economic wellbeing and remove barriers that can create social isolation.' Policy LTP PD 4.4 – Road Safety pledges to 'contribute to improved safety, security and health by reducing the risk of death, injury or illness arising from transport, working with partners to improve personal safety perceptions and the promotion of transport that contributes to good health and wellbeing.' Policy LTP PD 6.1 – Gloucestershire's Pedestrian Network states that 'Gloucestershire County Council (GCC) will work with interested parties to provide an inclusive safe, reliable and efficient highway environment that encourages walking, and provides pedestrian links to connect communities, employment and services.' Policy LTP PD 6.2 - Rights of Way ensures that GCC will 'support the Rights of Way and Countryside Access Improvement Plan in identifying and seeking to support measures to improve safety, accessibility and the quality of the experience for walkers, horse riders, carriage drivers and those travelling by bicycle.' Policy LTP PD 6.4 - Pedestrian Safety states that 'GCC will contribute towards improved safety, security and health by reducing the risk of death, injury or illness arising from journeys on foot or by mobility mode.'
Regional	Joint Core Strategy (JCS) 2011-2031	The JCS is a partnership between GCC, Cheltenham Borough Council (CBC) and Tewkesbury Borough Council (TBC) which sets out a strategic planning framework for the three areas. The JCS Strategic Objective 1 – 'Building a strong and competitive urban economy' seeks to provide the right conditions and sufficient land in appropriate locations to support existing businesses and attract new ones. Strategic Objective 7 – 'Promoting sustainable transport' states a preference for improving access to services in rural and urban areas through new development, improved integrated transport links and supporting local and community led transport initiatives. Relating to Policy SD1: 'Employment – except retail development', paragraph 4.1.12 of the JCS states that there is agreement across relevant partners that the upgrading of M5 Junction 10 to an all movements junction will support the economy of the JCS area and that of wider Gloucestershire.

Scale	Document	Summary of Requirements
		Policy SD14: 'Health and Environmental Quality' states that new development must result in no unacceptable levels of air, noise, water, light or soil pollution or odour, either alone or cumulatively, with respect to relevant national and EU limit values. Policy INF1: 'Transport Network' states that developers should provide safe and accessible connections to the transport network to enable travel choice for residents and commuters. Of particular relevance to the Scheme is the notion that proposals should ensure that safe and efficient access to the highway network is provided for all transport modes. Policy INF6: 'Infrastructure Delivery' states that local planning authorities will seek to secure appropriate infrastructure, which is necessary, directly related, and fairly and reasonably related to the scale and kind of the development proposal, including the highway network, traffic management, sustainable transport and disabled peoples' access. Policy A4 North West Cheltenham is a site-specific policy for an area of land at north west Cheltenham. The land is a strategic allocation and the policy provides guidance on the development of the site. The development of this strategic allocation is dependent on the requirement that transport infrastructure improvements to be fully realised, which will be delivered by the Scheme. This is referred to as the North West Cheltenham Development Area. Policy A7 West Cheltenham is a site-specific policy for an area of land at west Cheltenham. The land is a strategic allocation and the policy provides guidance on the development of the site. The development of this strategic allocation is dependent on the requirement that transport infrastructure improvements to be fully realised, which will be delivered by the Scheme. This is referred to as the West Cheltenham Development Area. Policy SD5 Green Belt focuses on the protection of the green belt. The policy states that the boundaries of the Green Belt have been reviewed and safeguarded areas have been identified for longer-term development needs. Two of these areas of land are relevant to the Scheme - safeguarded land to the west of Cheltenham, adjacent to the West Cheltenham Development Area (allocated under Policy A7 of the JCS); and safeguarded land to the north-west of Cheltenham, adjacent to the M5 and the North West Cheltenham Development Area (allocated under Policy A4 of the JCS).
Local	The Cheltenham Plan (July 2020)	The Cheltenham Plan was adopted at a full council meeting of Cheltenham Borough Council on 20 July 2020. Policy HM3: Loss of Residential Accommodation states that development which involves the loss of residential accommodation through the demolition of existing housing will not be permitted, except where 'the proposed use would be beneficial to the wider economy and the local community.'

Scale	Document	Summary of Requirements
		Policy SL1: Safe and Sustainable Living requires new development to avoid 'unacceptable harm to the amenity of adjoining land users'. Policy HD8 Old Gloucester Road is a site-specific policy for an area of land at Old Gloucester Road. The land is allocated for residential development, approximately 175residential properties. Policy H2 Lansdown Industrial Estate is a site-specific policy for an area of land at Lansdown Industrial Estate. The land is allocated for mixed use employment and residential development.
Local	Tewkesbury Borough Plan 2011 to 2031, adopted 8 June 2022	Policy HEA1 Healthy & Active Communities states that major development should be designed in line with 'active design' principles. Policy COM1 Protecting Community Assets states that where proposals would lead to the loss of existing community assets, there should be no demonstrable current or future need for the asset. Furthermore, all efforts will need to have been made to maintain the asset. Policy RN1 Public Outdoor Space, Sports Pitch and Sports Facility Provision states that proposals where there will be a loss, in total or part, of public outdoor spaces, sports pitches and built sports facilities, this will be resisted. Policy TRAC1 Pedestrian Accessibility outlines the stance that pedestrian networks will be protected across Tewkesbury Borough, as well as extended and enhanced. Policy TRAC2 Cycle Network and Infrastructure seeks to protect and enhance the cycle network and infrastructure.

13.4. Methodology: general assessment approach

13.4.1. The assessment has considered the requirements of the EIA Regulations 2017 and general methodology and guidance documents including the DMRB standard, supplemented by the latest guidance on human health in EIA, published by IEMA[5][6].

13.4.2. The Scoping Report, Preliminary Environmental Information Report (PEIR) and this assessment follow the requirements and methodology set out in the DMRB LA112 (Population and Human Health), which provides a framework for assessing, mitigating and reporting the effects of highways projects on population and human health.

13.4.3. The assessment establishes the baseline population and human health conditions within the areas likely to be affected by the Scheme. The assessment then ascertains the likely positive and negative effects of the construction, operation, and maintenance of the Scheme on the Population baseline; and for the Human Health aspect, explores likely health outcomes together with opportunities for improving health and reducing inequalities.

13.4.4. The assessment draws conclusions about the likely significance of the population effects and human health outcomes reported – in relation to human health, this extends beyond the DMRB LA112 standard and develops the methodology further than described within the Scoping Report. The assessment of significance of health outcomes has been incorporated to better reflect the requirements of the EIA Regulations 2017 and in response to comments received through consultation. This change also reflects findings of a review of recent precedent relating to the Planning Inspectorate expectations for significance of human health effects to be addressed through EIA of road schemes and reported in ES documents[7]. IEMA guidance on determining significance of human health in EIA has been used as a reference point for supplementing the DMRB LA112 methodology.

13.4.5. DMRB LA112 standard states that land use effects shall be assessed during construction and for the first year of operation (future year scenario). After the first year of operation, the guidance asserts that effects on land use associated with routine maintenance operations are unlikely to be significant. On this basis, land use effects arising from routine maintenance of the operational Scheme are scoped out and have not been assessed.

13.4.6. A series of assumptions has been made for the purpose of assessing the impacts of transport movements by the construction workforce. These assumptions are also presented in Chapter 2 – The Scheme (Application document TR010063/APP/6.2).

13.5. Methodology: population

Population study area

13.5.1. DMRB standard for the Population assessment requires the study area to be based on the construction footprint / the Order limits (Scheme boundary). This requires the assessment to include compounds and temporary land, plus a 500 m area surrounding the Order limits. The Population assessment has therefore explored a study area of 500 m from the Order limits of the Scheme.

13.5.2. It should be noted that the methodology also allows some flexibility within this to extend or redact the 500 m area, depending on the sensitivity of receptors identified within it. For this Scheme, the study area for the population assessment has been set according to:

[5] Pyper, R., Lamming, M., Beard, C., Waples, H., Birley, M., Buroni, A., Douglas, M., Turton, P., Hardy, K., Netherton, A., McClenaghan, R., Barratt, T., Bhatt, A., Fenech, B., Dunne, A., Hodgson, G., Gibson, G., Purdy, J., Cave, B. (2022) IEMA Guide: Effective Scoping of Human Health in Environmental Impact Assessment.
[6] Pyper, R., Waples, H., Beard, C., Barratt, T., Hardy, K., Turton, P., Netherton, A., McDonald, J., Buroni, A., Bhatt, A., Phelan, E., Scott, I., Fisher, T., Christian, G., Ekermawi, R., Devine, K., McClenaghan, R., Fenech, B., Dunne, A., Hodgson, G., Purdy, J., Cave, B. (2022) IEMA Guide: Determining Significance for Human Health in Environmental Impact Assessment
[7] The Planning Inspectorate. Scoping Opinion: Proposed M60/M62/M66 Simister Island Interchange. 2021. (para. 13.7.13). Available at: TR010064-000030-TR010064 - Scoping Opinion.pdf (planninginspectorate.gov.uk) [Accessed: 22/11/2022]

- The extent and characteristics of the Scheme.
- The location (in relation to the Scheme), characteristics and sensitivity of communities and associated facilities / amenities.

13.5.3. The identification of receptors for the Population assessment has focused on this 500 m area – the study area has been expanded only where the nearest receptor or asset type to the Order limits falls beyond the 500 m threshold, with the assessment considering these assets as appropriate. This relates to a small number of community facilities, such as Giggles Nursery, Gloucester Community Dental Services, Springbank Surgery and Cheltenham Pharmacy, which is noted in the summary of population receptors provided in Table 13-10.

13.5.4. For the agricultural component of this assessment the study area is the entirety of the farm holdings whose land will be acquired on a permanent or temporary basis.

13.5.5. The population study area falls within the local authority areas of TBC and CBC.

Sensitivity of receptors

13.5.6. Using criteria set out in Table 3.11 within DMRB LA112, the sensitivity of land use and accessibility receptors (i.e. private property and housing, community land and assets, development land and businesses, agricultural land holdings, and WCH) has been determined by their location within the study area, close to the Scheme, characteristics and capacity to cope with change. The sensitivity criteria are set out in more detail in Table 13-3, drawing directly from DMRB LA112.

Table 13-3 – Environmental value (sensitivity) and descriptions

Receptor value (sensitivity)	Description
Very high	**Private property and housing** 1) Existing private property or land allocated for housing located in a local authority area where the number of households is expected to increase by >25% by 2041 (ONS data) and/or 2) Existing housing and land allocated for housing (e.g. strategic housing sites) covering >5 ha. and/or >150 houses
	Community land and assets Where there is a combination of the following: 1) Complete severance between communities and their land/assets, with little/no accessibility provision 2) Alternatives are only available outside the local planning authority area 3) The level of use is very frequent (daily) 4) The land and assets are used by the majority (>=50%) of the community
	Development land and business 1) Existing employment sites (excluding agriculture) and land allocated for employment (e.g. strategic employment sites) covering >5 ha
	Agricultural land holdings 1) Areas of land in which the enterprise is wholly reliant of the spatial relationship of land to key agricultural infrastructure 2) Access between land and key agricultural infrastructure is required on a frequent basis (daily)
	Walkers, cyclists, and horse riders (WCH) 1) National trails and routes likely to be used for both commuting and recreation that record frequent (daily) use. Such routes

Receptor value (sensitivity)	Description
	connect communities with employment land uses and other services with a direct and convenient WCH route. Little/no potential for substitution 2) Routes regularly used by vulnerable travellers such as the elderly, school children and people with disabilities, who could be disproportionately affected by small changes in the baseline due to potentially differing needs 3) Rights of way for WCH crossing roads at grade with >16,000 vehicles per day
High	**Private property and housing** 1) Private property or land allocated for housing located in a local planning authority area where the number of households is expected to increase by 16-25% by 2041 (ONS data) and/or 2) Existing housing and land allocated for housing (e.g. strategic housing sites) covering 1-5 ha. and/or >30-150 houses
	Community land and assets Where there is a combination of the following: 1) There is substantial severance between communities and assets, with limited accessibility provision 2) Alternative facilities are only available in the wider local planning authority area 3) The level of use is frequent (weekly) 4) The land and assets are used by the majority (>=50%) of the community
	Development land and business 1) Existing employment sites (excluding agriculture) and land allocated for employment (e.g. strategic employment sites) covering >1-5 ha
	Agricultural land holdings 1) Areas of land in which the enterprise is dependent on the spatial relationship of land to key agricultural infrastructure 2) Access between land and key agricultural infrastructure is required on a frequent basis (weekly)
	Walkers, cyclists, and horse riders (WCH) 1) Regional trails and routes (e.g. promoted circular walks) likely to be used for recreation and to a lesser extent commuting, that record frequent (daily) use. Limited potential for substitution 2) Rights of way for WCH crossing roads at grade with >8,000-16,000 vehicles per day
Medium	**Private property and housing** 1) Houses or land allocated for housing located in a local authority area where the number of households is expected to increase by >6-15% by 2041 (ONS data) and/or 2) Existing housing and land allocated for housing (e.g. strategic housing sites) covering <1 ha. and/or <30 houses.
	Community land and assets Where there is a combination of the following: 1) There is severance between communities and their land/assets, but with existing accessibility provision

Receptor value (sensitivity)	Description
	2) Limited alternative facilities are available at a local level within adjacent communities 3) The level of use is reasonably frequent (monthly) 4) The land and assets are used by the majority (>=50%) of the community
	Development land and business 1) Existing employment sites (excluding agriculture) and land allocated for employment (e.g. strategic employment sites) covering <1 ha
	Agricultural land holdings 1) Areas of land in which the enterprise is partially dependent on the spatial relationship of land to key agricultural infrastructure 2) Access between land and key agricultural infrastructure is required on a reasonably frequent basis (monthly)
	Walkers, cyclists and horse riders (WCH) 1) Public rights of way and other routes close to communities which are used for recreational purposes (e.g. dog walking), but for which alternative routes can be taken. These routes are likely to link to a wider network of routes to provide options for longer, recreational journeys 2) Rights of way for WCH crossing roads at grade with >4,000-8,000 vehicles per day
Low	**Private property and housing** 1) proposed development on unallocated sites providing housing with planning permission/ in the planning process
	Community land and assets Where there is a combination of the following: 1) Limited existing severance between community and assets, with existing full Disability Discrimination Act (DDA) 1995 compliant accessibility provision 2) Alternative facilities are available at a local level within the wider community 3) The level of use is infrequent (monthly or less frequent) 4) The land and assets are used by the minority (<=50%) of the community
	Development land and business 1) Proposed development on unallocated sites providing employment with planning permission/ in the planning process
	Agricultural land holdings 1) Areas of land in which the enterprise is not dependent on the spatial relationship of land to key agricultural infrastructure 2) Access between land and key agricultural infrastructure is required on an infrequent basis (monthly or less frequent)
	Walkers, cyclists, and horse riders (WCH) 1) Routes which have fallen into disuse through past severance, or which are scarcely used because they do not currently offer a meaningful route for either utility or recreational purposes 2) Rights of way for WCH crossing roads at grade with <4,000 vehicles per day

Receptor value (sensitivity)	Description
Negligible	**Private property and housing** N/A
	Community land and assets Where there is a combination of the following: 1) No or limited severance or accessibility issues 2) Alternative facilities are available within the same community 3) The level of use is very infrequent (a few occasions yearly) 4) The land and assets are used by the minority (<=50%) of the community
	Development land and business N/A
	Agricultural land holdings 1) Areas of land which are infrequently used on a non-commercial basis
	Walkers, cyclists, and horse riders (WCH) N/A

13.5.7. The sensitivity of the receptors to changes to the baseline conditions is critical to enabling the assessment of significance of resultant effects. The judgements relating to the sensitivity of receptors have been supplemented by consultation as appropriate (see Section 13.7 and information in Table 13-9). Table 13-9 presents a summary of all receptors, including the factors contributing to the sensitivity that has been assigned to them, which relate to the matters noted in Table 13-3.

Magnitude of Impact

13.5.8. The assessment of impacts on Population largely focuses on severance and land take of identified receptors within the study area, using the criteria and thresholds provided in Table 3.12 within DMRB LA112. These criteria and thresholds are replicated in Table 13-4.

13.5.9. Levels of usage and the characteristics of receptors and/or user groups have been taken into account when identifying the type and magnitude of impacts, which in turn influences proposals for any mitigation. The exception is the consideration of impacts on WCH. The DMRB LA112 standard focuses only on changes in journey length for this sub-topic with regard to the Population assessment.

13.5.10. This consideration of the magnitude of impacts has been informed by consultation as appropriate. Where consultation has influenced professional judgement, this is noted in the relevant assessment tables in Section 13.9.

Table 13-4 – Magnitude of impact criteria

Magnitude of impact (change)	Description
Major	**Private property and housing, community land and assets, development land and businesses and agricultural land holdings** 1) Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements. E.g. direct acquisition and demolition of buildings and direct development of land to accommodate highway assets and/or 2) Introduction (adverse) or removal (beneficial) of complete severance with no/full accessibility provision

Magnitude of impact (change)	Description
	WCH >500 m increase (adverse) or decrease (beneficial) in WCH journey length
Moderate	**Private property and housing, community land and assets, development land and businesses and agricultural land holdings** 1) Partial loss of/damage to key characteristics, features or elements, e.g. partial removal or substantial amendments to access or acquisition of land compromising viability of property, businesses, community assets or agricultural holdings and/or 2) Introduction (adverse) or removal (beneficial) of severe severance with limited/moderate accessibility provision **WCH** >250-500 m increase (adverse) or decrease (beneficial) in WCH journey length
Minor	**Private property and housing, community land and assets, development land and businesses and agricultural land holdings** 1) A discernible change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements, e.g. amendment to access or acquisition of land resulting in changes to operating conditions that do not compromise overall viability of property, businesses, community assets or agricultural holdings and/or 2) Introduction (adverse) or removal (beneficial) of severance with adequate accessibility provision **WCH** >50-250 m increase (adverse) or decrease (beneficial) in WCH journey length
Negligible	**Private property and housing, community land and assets, development land and businesses and agricultural land holdings** 1) Very minor loss or detrimental alteration to one or more characteristics, features or elements, e.g. acquisition of non-operational land or buildings not directly affecting the viability of property, businesses, community assets or agricultural holdings and/or 2) Very minor introduction (adverse) or removal (beneficial) of severance with ample accessibility provision **WCH** <50 m increase (adverse) or decrease (beneficial) in WCH journey length
No change	No loss or alteration of characteristics, features, elements, or accessibility; no observable impact in either direction

Significance of effects

13.5.11. As noted in DMRB LA112, the significance of effect is derived by combining the assigned value (sensitivity) of receptors with the magnitude of change (magnitude of impact) arising from a project.

13.5.12. The significance of effects within this assessment has been measured according to the Significance of Effect Matrix set out in DMRB LA 104 (see also Chapter 4 – Environmental Assessment Methodology (application document TR010063/APP/6.2)). The significance of effects is also informed by considerations of permanence of effect (temporary or permanent), type of effect (direct or indirect) and duration of effect (short term or long term).

13.5.13. Where two potential values of significance of effect are identified within the Significance of Effect Matrix, professional judgement is used to assign the value, based on understanding of details of both the magnitude of impact and sensitivity of the asset. For example, where a minor impact is identified in relation to a receptor of high sensitivity, professional judgement would be used to determine whether this results in a slight or moderate adverse effect. This has been informed, where possible, through consultation undertaken to supplement the assessment; and with reference to the Significance of Effect Descriptors set out in DMRB LA 104 and replicated in Table 13-5.

Table 13-5 – Significance of Effects Descriptors

Significance	Descriptors
Very large	Effects at this level are material in the decision-making process
Large	Effects at this level are likely to be material in the decision-making process
Moderate	Effects at this level can be considered to be material in the decision-making process
Slight	Effects at this level are not material in the decision-making process
Neutral	No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error

13.5.14. The assessment is reported in two steps, within a series of assessment tables:

- Step 1: an assessment of effects is provided for the receptors and/or communities identified as potentially experiencing changes due to the Scheme. This notes the source of these impacts. The resultant effect is categorised by cross-referring the receptor sensitivity to the magnitude of the impact (as per DMRB LA104) after taking account of the Scheme description and listed embedded mitigation and enhancement measures.
- Essential mitigation is noted, which represents additional matters that have been agreed to target specific assessment findings related to negative population effects.
- Step 2: a residual assessment of significance is provided. In addition to the items that inform the assessment at Step 1, this residual assessment takes account of the essential mitigation and how this may change the Step 1 assessment findings, leading to an assignment of the significance of the residual population effects reported.

13.5.15. Moderate, large and very large residual effects are considered to be “significant” in terms of the EIA Regulations 2017.

13.6. Methodology: human health

Human health study area

13.6.1. For Human Health, the study area is required by DMRB standard to encompass the communities and wards that are directly or indirectly affected by the Scheme. The selection of wards is informed by the extent and characteristics of the Scheme.

13.6.2. Outcomes reported within the Human Health assessment are largely derived from changes in wider determinants of health (see Table 13-7 and Table 13-8), which are influenced by factors addressed through other technical assessments (i.e. air quality, noise, vibration, landscape and visual amenity, contamination and water pollution).

Consequently, the definition of the Human Health study area has been informed by the findings of each relevant contributing technical chapter, allowing for variations between construction and operation due to the larger extent of temporary footprint of the Scheme. For reference, these topic specific study areas for the technical assessments that inform the human health assessment are described here:

- Air Quality – for construction, within 200 m of the temporary footprint of the Scheme to assess likely effects of construction dust; for operation, human health receptors identified within 200 m of the Affected Road Network (ARN) (see Chapter 5 – Air Quality (application document TR010063/APP/6.3)).
- Noise and Vibration – for construction, within 300 m of any construction works; for operation, within 1 km of any new or altered routes and 600 m from any affected roads (ARN) within the study area (see Chapter 6 – Noise and Vibration (application document TR010063/APP/6.4)).
- Landscape and Visual Amenity – for construction and operation, 1 km from the Order limits (see Chapter 9 – Landscape and Visual (application document TR010063/APP/6.7)).
- Geology and Soils – for construction and operation, for the assessment of agricultural land and agricultural holdings, the study area covers the entirety of the agricultural land which is crossed (see Chapter 10 – Geology and Soils (application document TR010063/APP/6.8)).
- Road Drainage and Water Conservation – for construction and operation, features of the water environment within 1 km of the Order limits (see Chapter 8 – Road Drainage and the Water Environment (application document TR010063/APP/ 6.6)).

13.6.3. The human health study area has been defined to include wards within both TBC and CBC. The extent of the human health study area comprises the combined boundaries of the relevant wards within the local authorities, which are Badgeworth, Churchdown St John's, Severn Vale North and Severn Vale South (TBC area); and Springbank, Swindon Village and St Peter's wards (CBC area). Note that the majority of the Order limits are located within Badgeworth and Severn Vale South wards.

13.6.4. It is acknowledged that the operational affected route network (ARN) for air quality and noise and vibration, respectively, include some parts of the transport network that fall outside the study area that has been defined for Human Health. These locations are at the extremities of the ARN and well beyond 500m from the Order limits, for example, in the eastern parts of Bishops Cleeve; a small section of the A40 between M5 Junction 11 and the centre of Cheltenham; and part of the north-eastern edge of Gloucester. In the relevant locations, traffic changes have not been noted to result in significant effects on noise or air quality within the relevant technical assessments and no other topic assessments have noted changes potentially relevant to health determinants.

13.6.5. In the interests of providing a proportionate assessment, the human health study area has not been expanded to include all of these wards, noting that the ARN represents a very small proportion of each affected ward. However, commentary is included within the assessment to reflect the potential for changes in health determinants to result in health outcomes in these specific locations close to the ARN, based exclusively on the consideration of impacts on human health determinants associated with changes in traffic flows.

Sensitivity of receptors

13.6.6. As noted in DMRB LA112, there is a need to identify the health profile of affected communities, identifying vulnerable groups / communities. The guidance notes that this shall include the following data:

- Percentage of community with increased susceptibility to health issues (vulnerable members, e.g., <16 & >65).
- Percentage of community with pre-existing health issues (e.g., respiratory disease/chronic obstructive pulmonary disease (COPD)).

- Deaths from respiratory diseases.
- Percentage of community with long term illness or disability.
- General health.
- Life expectancy.
- Income deprivation.

13.6.7. DMRB LA112 notes the requirement to identify determinants of health. Wider determinants of health are a diverse range of social, economic, and environmental factors which influence people's mental and physical health and social wellbeing. In considering determinants of health, the assessment has had regard to the World Health Organization's (WHO) constitutional statement that 'Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity'. The WHO also asserts that 'mental health is a state of well-being in which an individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and is able to make a contribution to his or her community.'

13.6.8. The IEMA guidance on scoping human health includes Table 5.1 (reproduced as Figure 13-1 in the introduction of this chapter), which proposes wider determinants of health that should be scoped into health assessment. The guidance also advocates providing an explanation of the relevant source (of a change to a health determinant), pathway (way in which the change can affect health) and receptor (the way in which the change to the health determinant manifests, and to who), in order to provide details on the relationship between determinants of health and health outcomes. This approach has been adopted for the assessment and is provided in Table 13-6, with further information about connections between receptors and changes to health determinants provided in Table 13-8.

Table 13-6 – The consideration of IEMA determinants of health and links to the DMRB determinants of health.

Category	Wider determinants of Health (IEMA)	Examples of impacts arising from the Scheme (links to source-pathway-receptor identification as per IEMA guidance)	Determinant to be scoped in or out; and link to the categories of determinants of health used for reporting in this ES (refer to **Table 13-7**)
Health related behaviours	Physical activity	The construction works will result in disruptions to the transport network, WCH routes and/bus routes specifically. This will result in reduced opportunities for active travel within the study area and between employment and community and recreational facilities. Reduced access to leisure centres, open spaces, and community centres may reduce participation in local sport activities and in turn physical activities. Disruption to WCH routes used for recreational purposes may also reduce physical activity participation, particularly during construction.	Scoped in. *Categories: characteristics of the transport network across all modes; access to community, recreational and educational facilities; access to green space and open space.*
	Risk-taking behaviour	Construction compounds with low security can enable criminal behaviours, in deprived areas in particular, and unauthorised access which may result in injuries or loss of life from slips, tips and falls, and conflict with vehicles and materials.	Scoped in. *Category: safety information, including risk of injuries and death*.
	Diet and Nutrition	The Scheme will not affect the production of food.	Scoped out – land used commercially for the production of food is considered through the agricultural assessment reported in Chapter 10 - Geology and Soils (application document TR010063/APP/6.8). *Category: impacts on users of Hayden Road Allotments and are considered in relation to access to green space and open space; and access to recreational facilities (a part of access to community, recreational and educational facilities).*

Category	Wider determinants of Health (IEMA)	Examples of impacts arising from the Scheme (links to source-pathway-receptor identification as per IEMA guidance)	Determinant to be scoped in or out; and link to the categories of determinants of health used for reporting in this ES (refer to **Table 13-7**)
Social environment	Housing	The Scheme does not involve the development of residential properties, but will enable the development of future housing. The assessment considers the changes that may arise in the future baseline scenario taking account of planned residential growth, provision of new services and facilities and changes in access across modes, exploring the implications for existing residents and incoming residents. The Scheme involves the demolition of residential properties. The assessment considers health effects such as stress and anxiety that are likely to arise for directly affected occupiers. The assessment also considers the impact of demolition on established sense of community, exploring health impacts on remaining residents in communities where some houses are demolished.	Scoped in. *Category: social cohesion; access to community, recreational and educational facilities; access to green space and open space; characteristics of the transport network across all modes*
	Relocation	The construction works will result in the demolition of properties, increased levels of pollution (noise, air quality, amenity etc) and reduced access between properties and local facilities. Some residents and businesses are to be relocated during the construction works either on a permanent basis (through compulsory purchase, due to demolition of properties and premises) or on a temporary basis. Residents may choose to relocate during the construction or operational years as a response to their own capacity to adapt to the Scheme.	Scoped out as the Scheme does not include the identification of properties or land that will host relocation. The process of household relocation is managed through the compulsory purchase process, which is separate from the EIA. *Category: impacts on people who will be supported to relocate (e.g. through compulsory purchase of homes or premises) and impacts that might lead to a person choosing to relocate are considered in relation to other health determinants that are scoped in – social cohesion; air quality; noise environment and vibration; landscape amenity; and*

Category	Wider determinants of Health (IEMA)	Examples of impacts arising from the Scheme (links to source-pathway-receptor identification as per IEMA guidance)	Determinant to be scoped in or out; and link to the categories of determinants of health used for reporting in this ES (refer to **Table 13-7**)
			characteristics of the transport network across all modes
	Open space, leisure, and play	Open spaces and leisure facilities and play spaces enable activities that can support physical and mental wellbeing. Construction works are likely to result in travel disruptions reducing access to open spaces, leisure facilities and play activities.	Scoped in. *Category: access to community, recreational and educational facilities; access to green space and open space; characteristics of the transport network across all modes.*
	Transport modes, access and support	The construction works will result in temporary road and WCH route closures, causing disruptions to the transport network and journey delays which will be anxiety inducing, particularly for travellers who are unaware of the works.	Scoped in. *Category: characteristics of the transport network across all modes*
	Community identity, culture, resilience and influence	The construction works, the operational years of the Scheme and the anticipated future housing developments on the strategically allocated sites will result in the setting and character of rural communities, such as Uckington and Elmstone, to become more urbanised and less distinctive in terms of identity.	Scoped in. *Category: landscape amenity*
	Social participation, interaction, and support	The construction works will result in disruptions to the transport network, WCH routes and/bus routes specifically. This will result in reduced access to community and recreational facilities which enable social opportunities.	Scoped in. *Category: access to community, recreational and educational facilities*
Economic environment	Education and training	The construction works could disrupt regular routes to educational facilities, including walking and public transport routes. This could add time and unpredictability to journeys, which could increase stress.	Scoped in.

Category	Wider determinants of Health (IEMA)	Examples of impacts arising from the Scheme (links to source-pathway-receptor identification as per IEMA guidance)	Determinant to be scoped in or out; and link to the categories of determinants of health used for reporting in this ES (refer to **Table 13-7**)
		The Scheme could present educational opportunities through construction activities – trainee positions may become available.	*Category: access to community, recreational and educational facilities*
	Employment and income	The construction of the Scheme will provide opportunities for employment, involved in construction. Individuals become employed as part of the Scheme will benefit and be less deprived than those who are unemployed.	Scoped in. *Category: access to community, recreational and educational facilities*
Bio-physical environment	Climate change and mitigation and adaption	The Scheme aims are not focused on mitigating or adapting to the impacts of climate change.	Scoped out.
	Air quality	The construction works will generate particulates and dust, which will lower air quality within the area of works. The reduced air quality will affect those with respiratory conditions of diseases, in particular.	Scoped in. *Category: air quality.*
	Water quality or availability	The construction works could produce contaminates. Changes to water flow paths could make it possible for contaminates to reach and contaminate water sources, during construction or operation. Reduced quality of water sources may negatively affect the health of biodiversity and humans.	Scoped in. *Category: soil and water pollution.*
	Land quality	The Scheme will result in the permanent and temporary loss of agricultural land. Land which will be temporarily used during the construction works will be returned to its previous use (or such other use as agreed with the landowner).	Scoped out – land used for agriculture is considered through the agricultural assessment reported in Chapter 10 - Geology and Soils (document reference TR010063/APP/6.8).

Category	Wider determinants of Health (IEMA)	Examples of impacts arising from the Scheme (links to source-pathway-receptor identification as per IEMA guidance)	Determinant to be scoped in or out; and link to the categories of determinants of health used for reporting in this ES (refer to **Table 13-7**)
	Noise and Vibration	The construction works will generate noise and vibration from excavation works and construction traffic. This will reduce the landscape amenity for residents and WCH users within the study area. The operational Scheme will change the noise environment, including through the introduction of the Link Road through predominantly agricultural land.	Scoped in. *Category: noise environment and vibration.*
	Radiation	The Scheme will not be a source of radiation.	Scoped out.
Institutional and built environment	Health and Social Care Services	Access to health and social care facilities may be reduced during construction works. The change in traffic flows and routes (for private motor vehicles and bus services) may present anxiety and could result in missed appointments, longer journey times, and wait times for at home care services.	Scoped in. *Categories: access to community, recreational and educational facilities; characteristics of the transport network across all modes.*
	Built Environment	The Scheme introduces urbanising features, both within the A4019 corridor and along the Link Road. The transport improvements delivered by the Scheme will also enable future strategic housing-led mixed-use development, which will result in the character of the built environment of the study area changing from a predominantly rural area to an urban extension of Cheltenham. This will change the established character and amenity for residents in the study area.	Scoped in. *Categories: access to community, recreational and educational facilities; access to green space and open space; characteristics of the transport network across all modes; landscape amenity.*
	Wider societal infrastructure and resources	The transport improvements delivered by the Scheme will enable future strategic housing-led mixed-use development. The future housing developments will contribute to increasing housing stock in the county; and incoming residents will generate new demand for services and facilities across a range of sectors, some of which will need to be met within the strategic development proposed. These	Scoped in. *Categories: access to community, recreational and educational facilities; access to green space and open space; characteristics of the transport network across all modes; landscape amenity.*

Category	Wider determinants of Health (IEMA)	Examples of impacts arising from the Scheme (links to source-pathway-receptor identification as per IEMA guidance)	Determinant to be scoped in or out; and link to the categories of determinants of health used for reporting in this ES (refer to **Table 13-7**)
		additional resources would also be available to existing residents of the study area once operational.	

13.6.9. It is well established in the UK and internationally that the factors that influence health and well-being within the affected population vary by age, gender, ethnicity, disability, income, and social support. The most sensitive or vulnerable members in society often stand to lose the most from both the construction and operational stages of a project and this can lead to health inequality and health and social equity issues that must be addressed. This also reflects IEMA guidance for assessing health impacts in EIA, which recommends that specific attention should be paid to impacts on vulnerable groups within the community. These groups are noted in the guidance as likely to be more susceptible to the changes to health determinants than other social groups and are typically differentiated by their age, health status and income.

13.6.10. For the local population overall, the key challenges to physical health, mental and social well-being generally arise from the wider social, economic, and environmental determinants of health, as well as from unhealthy lifestyle behaviours and inactivity, which influenced by the way people interact with roads, traffic, and the local transport network. In this context, the following receptors are likely to be exposed to health impacts arising from the Scheme; and this has informed the identification of receptors for the assessment. In all instances, the study area reference relates to the human health study area comprising the geographic extent of the wards directly and indirectly affected by the Scheme:

- Residents of properties in the study area.
- Persons using open space, greenspace, and recreational facilities in the study area.
- Persons travelling to/from, and using, local services in the study area.
- Employees and customers at businesses in the study area.
- Pedestrians and cyclists using recreational routes and the local footpath, cycleway, and road network within the study area.
- Visitors to attractions or destinations in the study area.
- Public transport users in the study area.

13.6.11. Identification of vulnerable groups has been made through examining relevant plans and policies in respect of the study area to identify key health and wellbeing issues, but also through examining the baseline data gathered for the study area and consideration of the nature of the Scheme. In response to consultation comments, the presence of and potential impacts upon support groups serving the health needs of residents within the study area have also been explored (for example, the presence or absence of community venues hosting mother and baby groups; sports and cultural activity clubs; scouting and guiding; and mental health related support activities).

13.6.12. The baseline and community health profile has been established from analysis of local socio-economic, demographic and health data in comparison with sub-regional and national data. It provides an understanding of data relating to the determinants of health (see Table 13-7) and receptors in the study area, particularly the presence of any sensitive groups that may be more vulnerable or susceptible to potential impacts, also informed by the findings of the Equalities Impact Assessment (EqIA) undertaken for the Scheme (Application document TR010063/APP/7.6). DMRB LA 112 also notes that where available, information collated from stakeholder consultation should also be used. Liaison with officers within the Prevention, Wellbeing and Communities team in GCC has informed the understanding of health and wellbeing issues considered important to address; and ward level profiles for the human health study area have been generated by the GCC team for the express purpose of informing this assessment.

13.6.13. DMRB LA 112 notes that once the health profile of communities has been established, the sensitivity of a community / population to change shall be identified and supported with evidence. The sensitivity of a community / population is defined as:

- Low.
- Medium.
- High.

13.6.14. The IEMA guidance on human health in EIA provides indicative criteria for assigning health sensitivity. This is reproduced in Figure 13-2. These criteria have been used to inform the assignment of sensitivity to changes in determinants of health that has been used in this assessment in relation to the identified receptors.

Table 7.1 Health sensitivity methodology criteria

Category/Level	**Indicative criteria (judgement based on most relevant criteria, it is likely in any given analysis that some criteria will span categories)** The narrative explains that the population or sub-population's sensitivity is driven by (select as appropriate):
High	*high* levels of deprivation (including pockets of deprivation); *reliance* on resources shared (between the population and the project); existing *wide* inequalities between the most and least healthy; a community whose outlook is predominantly *anxiety or concern*; people who are *prevented* from undertaking daily activities; *dependants*; people with *very poor* health status; and/or people with a *very low* capacity to adapt
Medium	*moderate* levels of deprivation; *few* alternatives to shared resources; existing *widening* inequalities between the most and least healthy; a community whose outlook is predominantly *uncertainty* with some concern; people who are *highly limited* from undertaking daily activities; people providing or requiring *a lot of care*; people with *poor* health status; and/or people with a *limited* capacity to adapt
Low	*low* levels of deprivation; *many* alternatives to shared resources; existing *narrowing* inequalities between the most and least healthy; a community whose outlook is predominantly *ambivalence* with some concern; people who are *slightly limited* from undertaking daily activities; people providing or requiring *some care*; people with *fair* health status; and/or people with a *high* capacity to adapt
Very Low	*very low* levels of deprivation; *no* shared resources; existing *narrow* inequalities between the most and least healthy; a community whose outlook is predominantly *support* with some concern; people who are *not limited* from undertaking daily activities; people who are *independent* (not a carer or dependant); people with *good* health status; and/or people with a *very high* capacity to adapt.

Figure 13-2 - Indicative criteria for assigning health sensitivity (Source: Table 7.1 IEMA 2022[8])

13.6.15. The sensitivity of an individual or population sub-group is defined as encompassing their ability to withstand exposures and the range of associated impacts or effects, and the physiological (e.g. co-morbidities or disabilities) and socio-economic factors that increase their susceptibility to the exposure. However, it is important to note that assessment of EIA significance at the level of individuals is not proportionate (IEMA human health significance guidance, para. 5.2) and therefore the assessment of the Scheme explores the effects at a population and sub-population level.

13.6.16. Section 13.12 includes Table 13-47, which sets out the different categories of receptors that have been identified for the purposes of the human health assessment. Each receptor category is then assigned a single sensitivity score, which is based on an analysis of the baseline data in relation to the indicative criteria published in the IEMA guidance and reproduced at Figure 13-2. As a supplement to this, Table 13-49 highlights how sensitivity to certain determinants of health may alter within these receptor groups, where they may contain a proportion of vulnerable groups.

Assessment

13.6.17. The determinants of human health likely to be affected by a project are noted in the methodology and guidance documents used for this assessment as environmental conditions relevant to human health. DMRB LA112 provides an indicative list. In this

[8].Pyper, R., Waples, H., Beard, C., Barratt, T., Hardy, K., Turton, P., Netherton, A., McDonald, J., Buroni, A., Bhatt, A., Phelan, E., Scott, I., Fisher, T., Christian, G., Ekermawi, R., Devine, K., McClenaghan, R., Fenech, B., Dunne, A., Hodgson, G., Purdy, J., Cave, B. (2022) IEMA Guide: Determining Significance for Human Health in Environmental Impact Assessment

instance, liaison with bodies such as the UK Health Security Agency (UKHSA), who are responsible for protecting communities from health threats, raised a number of health and wellbeing issues that it was considered important to address and these have supplemented the approach (further information relating to consultation is in Section 13.7).

13.6.18. In addition to those indicative health determinants noted within DMRB LA 112, it was considered precautionary to examine a wider range of health determinants considered relevant to the Scheme. IEMA guidance on wider health determinants was used to identify wider environmental, social, and economic aspects considered relevant to the Scheme. The information within Table 5-1 of the IEMA guidance on human health in EIA (reproduced as Table 13-6 in this document) has been used to inform the production of Table 13-7, which identifies the determinants of human health that have been used in the assessment of the Scheme.

13.6.19. By including both the DMRB LA 112 indicative determinants of health and the wider range of determinants of health noted through IEMA guidance, it was possible to identify the proportionate range of determinants of health to be examined in relation to this Scheme. These are as detailed in Table 13-7.

Table 13-7 – Determinants of human health scoped into the assessment

Aspect	Determinants of health relevant to impacts from the Scheme
Natural environment	**Air quality** – to include air quality management areas and ambient air quality **Soil and water pollution**– to include areas of contamination and known sources and pathways
Built environment	Risk of injuries and death – to include **safety information** associated with the existing affected road network (numbers killed and seriously injured)
Activities	**Characteristics of the transport network** – considering outline spatial characteristics of the transport network and usage in the area and including road network and public transport routes, as well as Active Travel, to include designated public rights of way, bridleways, cycleways, non-designated public routes
Landscape amenity	**Landscape amenity** including the way in which the Scheme may alter the character of the landscape
Local economy	Severance/separation from **educational facilities**, including training facilities and development land and business
Community	Location and type of **community, recreational, educational and healthcare facilities** and to include severance / separation from such facilities Location and type of **green space, open space,** recreation and leisure-time activities and to include severance / separation from such facilities Social cohesion, within and between communities, including changes in the distribution and amount of housing
Lifestyle	**Noise environment and vibration** – to include noise important areas and noise management areas and ambient noise environment

13.6.20. Note that within the above table, the text marked in bold denotes terms used in this human health assessment, with the additional text provided for clarity to show the issues addressed within. All aspects of the indicative determinants of health provided within DMRB LA112 have been included within this assessment approach.

13.6.21. For human health, potential health impacts have been considered drawing on the above determinants of health and professional judgement to consider how these may relate to likely changes arising from the Scheme. This connection between determinants of health and impacts from the Scheme is summarised in Table 13-8.

Table 13-8 – Determinants of Human Health – connections to impacts that could theoretically arise from the Scheme

Determinant of Health – topics used for reporting in this ES	Impact to health that could theoretically arise from the Scheme, including to~~o~~ sensitive groups
Air quality: AQMAs and ambient air quality	Poor environmental quality and exposure to traffic derived pollutants are linked to increased risk for physical health, including respiratory and gastrointestinal problems, and lower mental health outcomes. Those with existing health issues are likely to be more sensitive. Asthma, allergies, and some types of cancer are of particular concern to children.[9]
Soil and water pollution: Land/water contamination	Soil and water pollution can lead to public health impacts directly when people encounter water and soil through recreation activities and or indirectly through the use of water for gardens and allotments watering. Polluted surface water runoff and direct migration of mobile pollutants to groundwater resources from construction vehicles, plant and high-risk activities have the potential to contaminate groundwater resources.
Safety information: Numbers of killed and seriously injured	An individual's risk of injury may be influenced by many social, personal, economic, and environmental factors. The physical environment such as transport systems and infrastructure, land use and urban development can affect the rate of incidents, injuries, and death.
Characteristics of the transport network: usage and provision of roads, public transport**,** and Active Travel options	The characteristics of the transport network are a key influence on human behaviours – locations served by public transport that equals or betters journey times in private vehicles can be effective in achieving modal shift, with attendant health benefits in relation to reduced private vehicle emissions and congestion. Public transport is also essential in addressing inequalities associated with accessibility and serving those with disabilities. Well-connected Active Travel networks can support healthy transport choices such as walking and cycling, with the potential to lead to reductions in obesity and improved aerobic and bone health. Footpath and cycle networks also play an important role in recreation and access into and through the countryside as well as connecting destinations, which can also support mental health as well as the physical health benefits of Active Travel.
The location and type of **community, recreational and educational** facilities**,** and severance/separation of communities from such facilities	Social infrastructure covers a range of services and facilities that meet local and strategic needs and contribute towards a good quality of life. Community facilities play a vital role in supporting community interaction and facilitating recreational activities, particularly in sparsely populated rural communities. For rural communities a key aspect of maintaining this is to ensure that adequate access is provided in order for these facilities to be utilised. Housing is not just a dwelling place. It provides comfort, shelter, safety, and warmth. It provides the main setting for our health throughout our lives. Good housing and physical and financial access to housing can play its part in reducing health inequalities and health harms[10].

[9] WHO Ambient air pollution: Health impacts. 2022. Available at: https://www.who.int/airpollution/ambient/health-impacts/en/. [Accessed on 22/11/2022]
[10] Housing LIN Practice Brief. Closing the health gap – a gap worth closing: How housing can play its part in reducing health inequalities. 2016. Available at:

Determinant of Health – topics used for reporting in this ES	Impact to health that could theoretically arise from the Scheme, including to~~o~~ sensitive groups
	Education plays a major role in a person's overall health and well-being[11]. Education can affect us throughout our lifetime and has been shown to increase healthy behaviours and improve health outcomes, including obesity rates. Early education is especially important because it sets the foundation for a healthy life.
The location of **healthcare facilities** and severance/separation of communities from such facilities	Availability and use of healthcare services that prevent and treat disease and other social infrastructure is important for promoting and maintaining health, preventing, and treating disease, reducing unnecessary disability and premature death, and achieving health equality for the population. Groups more sensitive to illness, such as the elderly and children, benefit disproportionately.
Educational facilities: Access to work and training, including development land and business	Income and work are two of the most important determinants of health and wellbeing[12],[13]. Employment and skills influence mental and physical health, with low education levels and unemployment linked with increased stress, lower self-confidence, increased rates of illness and premature death. Those on lower incomes due to low skills or unemployment are also less likely to be able to engage in healthy behaviours, which affect physical and mental health.
Noise environment and vibration: Areas recognised as being sensitive to noise (including NIAs)	Noise is linked to potential negative effects on physical, social and mental well-being[14,15]. Potential health effects identified include hearing loss or loss of hearing sensitivity, sleep disturbance, cardiovascular and physiological effects, mental health effects and behavioural effects, including poor school performance by school children.
Severance/separation from **open space, recreational and leisure time activities**	Sufficient access to green and open space can be linked to both physical and mental health. Physical benefits from green infrastructure include improved air quality and reduced noise pollution, whilst impacts on mental wellbeing are linked to increased social interaction and reduced antisocial behaviour, isolation, and stress[16].
Landscape amenity	Landscape amenity is a key consideration in assessing the human health impacts of a scheme. There is an increasing recognition in public policy of the potential for landscapes to contribute towards better public health[17].

13.6.22. Human health receptors (within the broad categories as listed at 13.6.10) within the human health study area have then been identified. Consideration is given to the wider population of the study area and sub-populations of sensitive groups within that. In addition, human health receptors have also been included on the basis of geographical sub-populations that are anticipated to experience specific changes in determinants of health due to locally specific impacts from the Scheme. A further category of receptors is

https://www.housinglin.org.uk/_assets/Resources/Housing/Support_materials/Practice_briefings/HLIN_PracticeBriefing_HealthInequalities.pdf. [Accessed on: 22/11/2022]
[11] Economic and Social Research Council. The wellbeing effect of education. 2014. Available at: https://esrc.ukri.org/news-events-and-publications/evidence-briefings/the-wellbeing-effect-of-education/. [Accessed on: 22/11/2022]
[12] WHO The determinants of health.2022. Available at: https://www.who.int/hia/evidence/doh/en/. [Accessed on: 22/11/2022]
[13] Joseph Rowntree Foundation Report. How does money influence health? 2014. Available at: https://www.jrf.org.uk/sites/default/files/jrf/migrated/files/income-health-poverty-full.pdf. [Accessed on: 22/11/2022]
[14] WHO Noise 2022. Available at: http://www.euro.who.int/en/health-topics/environment-and-health/noise/noise. [Accessed on: 22/11/2022]
[15] WHO Noise. 2022. Available at: https://www.who.int/sustainable-development/transport/health-risks/noise/en/. [Accessed on: 22/11/2022]
[16] UKHSA. Green Space, mental wellbeing and sustainable communities.2016. Available at: https://ukhsa.blog.gov.uk/2016/11/09/green-space-mental-wellbeing-and-sustainable-communities/. [Accessed on: 22/11/2022].
[17] Landscape Institute. Public health and landscape. 2013. Available at: https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/migrated-legacy/PublicHealthandLandscape_CreatingHealthyPlaces_FINAL.pdf [Accessed on: 22/11/2022]

included, which relate to physical assets that are important in supporting human health – an example is West Cheltenham Fire Station. The human health baseline also identifies relevant assets that have the potential to influence health outcomes for these receptors, such as community assets and transport infrastructure. The resultant list of receptors and information about their characteristics and sensitivity is provided in Table 13-47.

13.6.23. The impacts of the Scheme on the human health receptors have been assessed on an individual basis. The narrative includes consideration of relevant impacts on determinants of human health across the range of topics scoped into the assessment (Table 13-8), summarised here:

- **Community, recreational and educational facilities**: accessibility and severance in relation to community, recreational and educational facilities. This includes **Healthcare**: accessibility and severance in relation to healthcare facilities (as a specific sub-set of **community facilities**), including groups and networks supporting mental health identified through consultation.
- **Green space and outdoor space**: accessibility and severance in relation to green space and open space as recreational assets.
- **Changes to characteristics of the transport network for all modes**: changes to the existing spatial characteristics of the transport network and usage in the study area, encompassing the road network, designated public rights of way, cycle ways, non-designated public routes, and public transport.
- **Air quality**: changes to ambient air quality and impacts for AQMA.
- **Noise environment and vibration**: changes to noise levels and noise generation in the study area, including the presence of areas sensitive to noise such as NIAs.
- **Soil and water pollution**: changes to the sources and pathways of potential pollution leading to odour and contamination.
- **Landscape amenity**: changes to landscape amenity and key characteristics including urbanisation and light spill. Considering particularly where and how this may be linked to health and well-being.
- **Safety information:** with particular focus on transport user safety across modes, but also including changes to risk of injury and deaths both during construction and in operation.

13.6.24. The assessment of human health focuses on the outcomes that are anticipated to arise from changes to determinants of health, for example ease of access, factors affecting or altering risks to physical health, changes to amenity and presence or absence of typical triggers of increased stress, anxiety, or poor mental health. Where the assessment of outcomes on human health receptors relates to their use of community assets, the focus is on the impacts of the Scheme within the defined human health study area. It is acknowledged that the ARN for the Scheme extends, in a limited number of locations, beyond the human health study area (see 13.6.4). Where this is the case, a commentary is provided on potential for health outcomes associated with anticipated increases or decreases in traffic flow for residents close to the ARN.

13.6.25. The Human Health assessment considers the effects of the Scheme on the health of the population likely to be affected by the Scheme overall. Where data is available relating to the spatial or proportionate distribution of people with protected characteristics within parts of the human health study area, observations are made about how Scheme impacts could lead to differential health outcomes.

13.6.26. DMRB LA112 does not provide a methodology for assigning magnitude to impacts, because the focus is on the general direction of health outcomes rather than significance of effects. Assigning magnitude to impacts is an essential pre-requisite to using the matrix within DMRB LA104, to assess an overall level of significance of effects. To address this, the assessment uses the latest IEMA guidance to assign magnitude. This uses a series of indicative criteria to inform professional judgement, around the following characteristics of impacts on determinants of health:

- Exposure of the receptor to the impacts.

- Scale of the impacts.
- Frequency of the impacts.
- Duration of the impacts.
- The extent of the population affected by the impacts.
- The severity of the impacts.
- The permanence of the impacts.
- Implications of the impacts on service quality affecting determinants of health.

13.6.27. The application of the criteria follows Table 7.2 of the IEMA guidance, which is reproduced in this report as Figure 13-3 for ease of reference. In order to maintain consistency with the significance matrix provided in DMRB LA104, the categories within the IEMA guidance have been converted into the appropriate terminology, as follows:

- DMRB Major magnitude of impact – IEMA high.
- DMRB Moderate magnitude of impact – IEMA medium.
- DMRB Minor magnitude of impact – IEMA low.
- DMRB Negligible magnitude of impact – IEMA negligible.
- DMRB No change – no equivalent in IEMA.

13.6.28. The magnitude of impacts on determinants of health is included within the human health assessment tables in Section 13.13.

Figure 13-3 - Indicative criteria for categorising impact magnitude (Source: Table 7.2 IEMA 2022[18])

Table 7.2 Health magnitude methodology criteria

Category/Level	**Indicative criteria (judgement based on most relevant criteria, it is likely in any given analysis that some criteria will span categories)** The narrative explains that the population or sub-population's magnitude narrative explains that the magnitude of change due to the project is driven by (select as appropriate):
High	*high* exposure or scale; *long-term* duration; *continuous* frequency; severity predominantly related to *mortality* or changes in morbidity (physical or mental health) for *very severe illness/ injury* outcomes; *majority* of population affected; *permanent* change; *substantial* service quality implications
Medium	*low* exposure or *medium* scale; *medium-term* duration; *frequent* events; severity predominantly related to *moderate changes in morbidity* or *major change in quality-of-life*; *large minority* of population affected; *gradual* reversal; *small* service quality implications
Low	*very low* exposure or *small* scale; *short-term* duration; *occasional* events; severity predominantly related to *minor change in morbidity* or *moderate change in quality-of-life*; *small minority* of population affected; *rapid* reversal; *slight* service quality implications
Negligible	*negligible* exposure or scale; *very short-term duration*; *one-off* frequency; severity predominantly relates to a *minor change in quality-of-life; very few people* affected; *immediate* reversal once activity complete; *no* service quality implication.

Significance of effects

13.6.29. The DMRB LA112 methodology for assessment of human health does not assign a significance to effects; rather it uses a qualitative approach to identify changes to determinants of health as a result of the Scheme, with evidence provided to support conclusions. This approach has been followed to identify 'health outcomes', in accordance with the categories within DMRB LA112, which are reproduced at Table 13-9. The identification of human health outcomes has been informed by the results of specialist

[18].Pyper, R., Waples, H., Beard, C., Barratt, T., Hardy, K., Turton, P., Netherton, A., McDonald, J., Buroni, A., Bhatt, A., Phelan, E., Scott, I., Fisher, T., Christian, G., Ekermawi, R., Devine, K., McClenaghan, R., Fenech, B., Dunne, A., Hodgson, G., Purdy, J., Cave, B. (2022) IEMA Guide: Determining Significance for Human Health in Environmental Impact Assessment

technical assessments on aspects such as air quality and noise environment, professional judgement, best practice, and knowledge from the assessment of other highways schemes.

13.6.30. As a supplement to the DMRB methodology, the human health assessment has been progressed for this Scheme to assign significance to the impacts on determinants of health that in turn influence the health outcomes. This uses the DMRB LA104 significance matrix to cross-reference the sensitivity of receptor(s) to the magnitude of impacts on relevant determinants of health.

13.6.31. The assessment is reported in two steps, within a series of assessment tables:

- Step 1: a narrative is provided for the receptors and/or communities (i.e. the human health receptors) identified as potentially experiencing changes to health outcomes. This notes the source of these health outcomes, which are the impacts on the relevant determinants of health. A magnitude is assigned to the impacts. The health outcome is categorised (as per Table 13-9) and significance assigned (by combining sensitivity with magnitude and using the significance matrix in DMRB LA104) after taking account of the Scheme description and listed embedded mitigation and enhancement measures.
- Essential mitigation is noted, which represents additional matters that have been agreed to target specific assessment findings related to negative health outcomes.
- Step 2: a residual assessment of significance is provided. In addition to the items that inform the assessment at Step 1, this residual assessment takes account of the essential mitigation for health effects and how this may change the Step 1 assessment findings, leading to a final conclusion about the significance of residual effects and health outcomes.

13.6.32. Where appropriate, the assessment highlights which aspects of the embedded mitigation proposals are influential in the identification of health outcomes and the significance of effects reported – this is done through cross-reference to the numbered mitigation measures as expressed in Table 13-56 (these are reproduced from the Register of Environmental Actions and Commitments (REAC) (application document: TR010063/ APP/7.4)). This is included to provide clarity of the rationale behind the judgements formed about health outcomes in Step 1.

Table 13-9 – Health Outcome Category

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

Table Source: DMRB LA 112

13.6.33. In order to better reflect the requirements of the EIA Regulations 2017, address consultation comments and respond to recent precedent, each health outcome is accompanied by a judgement of significance provided through a narrative approach. This forms the conclusion to Step 1, described above. The aim of this is to distinguish between significant and non-significant effects that contribute to the health outcomes in relation to the health of the population.

13.6.34. For each judgement of significance made, a narrative has been provided to explain which factors have been considered. The following considerations have been made, where relevant, to provide consistency in the formation of the judgement of significance by the assessor, which is an approach that is advocated in the IEMA guidance:

- Whether there would be a high level of exposure or widespread impact.
- Whether the population exposed to an impact is particularly sensitive due to pre-existing vulnerabilities or inequalities.

- The duration of effects and whether they would be reversible.
- The level of acceptability, including whether statutory thresholds for pollutants would be exceeded and/or whether the issue is a public health priority.
- The severity of the related health outcomes (i.e. whether it is related to a change in mortality or morbidity).
- The strength of evidence for an association between a change in a determinant and health outcomes.
- Whether a large proportion of the population would likely be affected.
- Whether the impact is likely to increase or tackle health inequalities at a population level.

13.6.35. The assessment tables then document the way in which essential mitigation may alter the conclusions drawn from Step 1. This then leads to a statement about the residual effects of the Scheme on the receptor(s).

13.6.36. Human Health effects have been assessed during construction, at opening year and at year 15 of operation (future year scenario). In response to consultation comments and noting the role of the Scheme in delivering infrastructure improvements that are required in JCS policy to enable strategic development sites, the human health assessment takes account of the housing and employment growth proposed at the North West Cheltenham Development Area, West Cheltenham Development Area and safeguarded land to the north-west of Cheltenham within the future year scenario.

Limits of deviation

13.6.37. The assessment has been conducted within the Limits of Deviation (LoD) outlined within Chapter 2 - The Scheme (Application document TR010063/APP/6.2). The vertical and lateral LoD for the Scheme have been reviewed with respect to sensitive receptors identified within this ES chapter and would not affect the conclusions of the assessment reported in this chapter.

13.7. Consultation

13.7.1. DMRB LA 112 advocates stakeholder engagement as a means of supporting the assessment and notes (at 2.1.1) that ‘consultation for the population and health assessment should complement and not duplicate consultation activities undertaken as part of the broader project development process.’ Paragraph 2.1.2 cites the following list of stakeholders who may usefully be engaged for the Population and Human Health assessment:

- 1) local authority officers (economic and environmental) and the director of public health.
- 2) community leaders/representatives and leaders of local interest groups.
- 3) affected community groups (e.g., residents/ neighbourhood associations, schools, places of worship, community centres).
- 4) representatives of national and local recreational societies/traveller groups such as ramblers’ associations and equestrian groups.
- 5) local elected officials (e.g., parish/local councillors, members of parliament, local crime officers).
- 6) local police force.
- 7) other stakeholders identified by the Overseeing Organisation.

13.7.2. The stakeholder engagement team for the Scheme has undertaken a range of non-statutory and statutory consultation activities that have been effective in engaging with stakeholders across all of the groups listed at 13.7.1. A summary is presented below, and further details are provided in Chapter 1 – Introduction (Application document TR010063/APP/6.2). Specific activities have targeted landowners who own land that is expected to be directly affected by the Scheme. These include businesses and

homeowners with premises wholly or partly within the Order limits and close to the Scheme, some of which are relevant for the Population and Human Health assessment. Where appropriate, consultation responses have been considered within the assessment process. Landowners were engaged in the run up to the consultation and the preferred route announcement and agricultural businesses have been consulted directly where landholdings are within Order limits.

13.7.3. Statutory, non-statutory and targeted consultation have been held with key stakeholders as part of the Scheme development. Non-statutory consultation (14 October – 25 November 2020) and Statutory consultation (8 December 2021 – 16 February 2022) events were undertaken for the Scheme, which also sought engagement across all of the groups noted in 13.7.1. The needs of pedestrians, cyclists and equestrians were a popular topic for respondents. Three rounds of targeted consultation were undertaken between 8 August and the 5 September 2022, from the 21 December 2022 and the 18 February 2023, and from the 29 May to 27 June 2023 to cover changes in the design since the statutory consultation, with information provided to prescribed consultees[19], affected landowners, and to the informal Traveller site. Stakeholders contacted directly for comment as part of the non-statutory and statutory consultation events (covering groups 1, 2, 3, 4, 5 and 7 as listed at 13.7.1) who are relevant to this assessment include:

- Boddington Parish Council.
- Elmstone Hardwicke Parish Council.
- Uckington Parish Council.
- Staverton Parish Council.
- Leigh Parish Council.
- Principal Public Rights of Way officer (GCC).
- British Horse Society.
- Cheltenham and Tewkesbury Cycle Campaign (via website contact page).
- Cycling UK (formerly Cyclists Touring Club).
- Sustrans.
- Ramblers.
- Royal National Institute for the Blind.

13.7.4. The use of weekly statutory consultation statistics enabled targeted consultation, through emailing local and national organisations and charities, to increase engagement with underrepresented groups in particular disabled and wheelchair users. This is described within the EqIA (Application document TR010063/APP/7.6).

13.7.5. Key responses from the Public Consultation event of relevance to the Population and Human Health assessment, which have been considered in developing the Scheme, are summarised below:

- A number of dedicated cycle paths should be provided as part of the Scheme.
- Footways in the area being poorly maintained.
- Support for walking and cycling improvements along the A4019 corridor.
- Include WCH facilities over the M5 at the new junction.
- West Cheltenham Link Road – include segregated routes/crossings for pedestrians/cyclists on the link road.
- Provide facilities that connect to local villages and the wider WCH network.

13.7.6. In order to further inform the Population and Human Health assessment, a shortlist of receptors with whom topic-specific consultation was considered desirable was provided to the stakeholder engagement team, using the DMRB list as a guide (as per para. 13.4.1). A number of questions were posed to community venues in order to gain consistent information about receptor use patterns and user groups. Consultation responses and

[19] The information was only provided to those prescribed consultees where the design change altered an aspect of the Scheme that was within their remit.

interactions with affected businesses were also reviewed to inform the development of the baseline. This was followed up directly with organisations as appropriate.

13.7.7. Officers within the Public Health and Communities team[20] at GCC were consulted to explore opportunities for addressing potential negative health outcomes, including considering any recent precedent of which the officers were aware. GCC officers were also contacted to share recent experience of community liaison and controls during construction on comparable projects, to explore themes relating to community anxiety and mental health. The aim of the further engagement was to ensure that:

- Community assets within the study area and serving residents of the study area were correctly identified.
- Understanding of community facilities and organised activities within the study area and serving residents of the study area was obtained.
- Understanding of user catchments was enhanced.
- Any concerns of community members with regard to direct and indirect impacts in relation to the scope of the Population and Human Health assessment were understood, such that they could be considered within the assessment.
- School transport provision was identified (i.e. where children are picked up and dropped off and how they access these points).
- Key access routes, including for WCH, were identified.
- Opportunities identified by users regarding enhancement along desire lines / linking up WCH routes are correctly understood to enable their consideration.
- Consultees were encouraged to discuss their ideas for mitigation and enhancement of any actual or perceived impacts on Population and Human Health factors.

13.7.8. In terms of local businesses and community assets, the consultation sought to obtain information on usage levels relating to user groups and their characteristics, as well as the spatial distribution of user groups.

13.7.9. The completion of the consultation activities outlined above allowed a greater level of confidence in the assumptions made about the size and spatial distribution of user catchments for the facilities expected to be affected by the Scheme, allowing for the correct assignment of the magnitude of impact. The validation process encompassed those likely to experience direct effects, such as land take; as well as those expected to experience substantial disruption (relating to access in the main, but also considering disturbance where the receptor was noted to be particularly sensitive).

13.7.10. The aim of the conversations with stakeholders related to fact finding. However, a further aim related to ascertaining any possible impacts so that, if necessary or appropriate, solutions could be explored that would work for the consultees and within the reasonable scope of the Scheme.

13.7.11. Initial farm impact assessments were undertaken with affected landowners and occupiers where there was a need to inform the design. Consultation with agricultural landowners is reported in Chapter 10 – Geology and Soils (Application document TR010063/APP/6.8).

13.8. Baseline conditions – Population

13.8.1. Baseline conditions have been established through a desk-based study and consultation with landowners and the wider community. Information (including through site surveys such as that carried out for WCH) was also gathered by relevant specialists as part of their survey work and this was used to inform this assessment where appropriate. Receptors affected directly (i.e. through demolition or land take) were subject to targeted consultation (e.g. agricultural investigation, or further clarification on access and usage was sought).

13.8.2. A range of data sources was also used, including Public Health England Health Profiles and other online sources of information such as Joint Strategic Needs Assessments

[20] At the time of consultation, this team was the 'Prevention, Wellbeing and Communities Team'.

(JSNA). In addition, Ordnance Survey and Bing mapping (various scales), as well as the Project WebGIS, aerial photography, and street level images available in the public domain were also used. These were used to help identify land use relationship, community land and facilities and direct verification work undertaken through site visits.

13.8.3. A summary of receptors identified within the study area is provided in Table 13-10. Key criteria that have been considered in assigning this sensitivity are those set out in DMRB LA112 and replicated in Table 13-3.

Private property and housing

13.8.4. The study area is rural in character. Private residential properties are largely clustered in low-density, rural village settlements between Gloucester and Cheltenham. There are several settlements within the study area which include Uckington and the villages Staverton and Boddington to the west, Hayden, and Staverton to the south, and Elmstone Hardwicke to the north. The greatest concentrations of private residential properties relative to the Scheme are found in the larger settlement of Cheltenham (overlapping with the eastern end of the Scheme area). With the exception of the north-west edge of Cheltenham, all of these settlements are outside the Order limits.

13.8.5. Notably, there is an area of land partly within the Order limits adjacent to the southbound carriageway of the M5 which is currently occupied by travellers. It is referred to as the 'informal Traveller site' in this document.

13.8.6. The only settlement fully within the Order limits is Uckington, which is spread either side of the A4019 approximately halfway between Cheltenham and the M5. In addition to Uckington there are several clusters of properties within the Order limits, notably the clusters of properties at Withybridge Gardens and Stanboro Lane, adjacent to the south-east and north-west of the existing M5 Junction 10 respectively.

13.8.7. The JCS includes several strategic and safeguarded allocations. The North West Cheltenham Development site, the West Cheltenham Development site and the safeguarded land to the north-west of Cheltenham are located within the study area. The two named development sites are allocated for residential and employment land uses, while the safeguarded land is identified to meet future development needs beyond the JCS period. A strategic allocation for residential uses within the study area is also identified in the Cheltenham Local Plan. Collectively, there are approximately 7560 residential properties identified in current development plans to be developed within the study area.

13.8.8. There are two planning applications approved for residential housing on unallocated land within the study area, for a total of 75 residential properties.

Community land and assets

13.8.9. The amount, size and type of community facilities is reflective of the low density residential population and the village focus of the settlements within the study area. Residents of the study area are expected to also make use of community land and assets within Cheltenham, to the east of the study area, on the basis that this larger settlement provides a greater range and variety of facilities.

13.8.10. There are few community facilities, largely places of worship and community halls, located within the village settlements of Uckington, Boddington and Elmstone Hardwicke.

Development land and business

13.8.11. Agricultural activity is predominantly in the rural parts of the study area. To the east of the Scheme, there is a retail focus. Key employment sites within the study area include Gallagher Retail Park, Gateway Retail Park, and Kingsditch Trading Estate to the east of the Order limits; Blaisdon Way commercial premises to the south-east of the Scheme; and Elmstone Business Park to the west of the Scheme.

13.8.12. The JCS strategic and safeguarded allocations include 68 hectares of business/ employment locations. The JCS allocations include a nationally significant cyber business park (Cyber Central UK), supported by the government and adjacent to the Government Communications Headquarters (GCHQ) site. This has been proposed as part of the West Cheltenham development site.

13.8.13. There are three planning applications for a total of 15 business units and one restaurant on unallocated land within the study area.

Walker, cyclists, and horse riders

13.8.14. There are a number of WCH routes that intersect with the Order limits, with a total of 151 PRoW within the study area. Given the rural character the study area, the WCH network is predominantly made up of a series of recreational routes and includes one regional walking route known as the Cheltenham Circular Path. These routes are largely focused around and between key settlements in the study area. The WCH routes to the east of the study area connect to the western edge of Cheltenham and are considered more likely to be used for commuting.

13.8.15. The M5 and the A4019 currently act as barriers, fragmenting the WCH network and limiting crossing movements. There is only one formal pedestrian crossing across the A4019 within the Scheme area. The only pedestrian crossing is a push button controlled pelican crossing at the Gallagher Retail Junction. There is an informal crossing across the A4019 at Uckington with no means to control the traffic.

13.8.16. The position of existing crossing infrastructure, which also includes footbridges and subways to cross the M5, are likely to have shaped the preferred routes for recreation and commuting within the study area.

13.8.17. Consultation and engagement have highlighted that in general terms bridleways, while present in parts of the study area, are not well connected to suitable on-road routes for continuing journeys by bicycle. Cyclist groups have raised safety concerns related to driver behaviours where there is limited width for safe passing on-road and noted that the road network is generally not suited to use by recreational, inexperienced or younger cyclists – there are no cycle facilities on the M5 as it is a motorway and where pavements are included alongside the A4019, these tend to be of low quality and narrow width (e.g. paths within the roadside verge). The bridleway provision that is used by equestrians tends to be to the north of the Order limits, with the prospect of encouraging a horse to safely cross the A4019 presenting a barrier to connectivity to other routes south of the A4019.

13.8.18. WCH routes within 250m of the Order limits have been included in the summary table. All PRoW between 250m and 500m of the Order limits have not been listed as none of these WCH routes will be impacted by the Scheme.

Table 13-10 – Summary of receptors for population assessment

Receptor Type and total within study area (approx. count)	Receptor name	Description	Within Order limits	Within 250m of Order limits	250m – 500m of Order limits	Sensitivity
Private property and housing (existing and planned) >25,500 (including planned residential development)	**Uckington** (three residential properties)	The community of Uckington is in the north-east of the population study area. There are less than 30 residential properties here. Three residential properties and one farm building are within the Order limits. The small size of this receptor cluster would typically be noted as being of medium sensitivity to change; however, this is within an area where the number of households is expected to increase by several thousand due to strategic planning policy (potentially within the 16-25% increase noted in the DMRB LA112 environmental value (sensitivity) descriptions), thus the sensitivity of the receptor has been elevated.	**Y**			High
	Withybridge Gardens (14 residential properties)	Withybridge Gardens comprises a small number of residential properties close to M5 Junction 10, to the south-west of the existing junction. There are less than 30 residential properties here, which determines the sensitivity category.	**Y**			Medium
	Withy Bridge (two residential properties)	There are two residential properties with associated garages and garden outbuildings on the north side of the A4019 near Withybridge Lane within the Order limits, to the east of M5 Junction 10. There are less than 30 residential properties here, which determines the sensitivity category.	**Y**			Medium
	Properties between Uckington and Gallagher Retail Park	There are 76 residential properties between Uckington and Gallagher Retail Park, some directly fronting the A4019, and others accessed	**Y (10)**	**Y**		High

Receptor Type and total within study area (approx. count)	Receptor name	Description	Within Order limits	Within 250m of Order limits	250m – 500m of Order limits	Sensitivity
	(76 residential properties)	from the roads that run perpendicular to the A4019 including Homecroft Drive and the northern part of Appleyard Close. Ten of these residential properties (comprising five semi-detached buildings) are within the Order limits and the others are adjacent or to the south. There are more than 30 and less than 150 residential properties here, which determines the sensitivity category.				
	Stanboro Lane (five residential properties)	There are five residential properties – three at Sheldon Nurseries and two semi-detached properties at Stanboro Lane, to the north-west of M5 Junction 10 and within the Order limits. There are less than 30 residential properties here, which determines the sensitivity category.	**Y**			Medium
	Policy A4 – North West Cheltenham Development Area: approximately 4,285 new residential properties (access and south-western edge of allocation within the Order limits); also associated with 16/02000/OUT outline application for 4115 homes within the site (>150 residential properties threshold)	The North West Cheltenham Development Area comprises land allocated within Policy A4 of the JCS for the development of approximately 4,285 residential properties within the JCS Plan period. The access and south-western edge of the allocation is within the Order limits, to the north of the A4019 and west of Gallagher Retail Park. There is also an outline planning application awaiting determination – 16/02000/OUT– for the construction of 4115 residential properties. Development of this site would exceed 150 residential properties, which determines the sensitivity category.	**Y**			Very high

Receptor Type and total within study area (approx. count)	Receptor name	Description	Within Order limits	Within 250m of Order limits	250m – 500m of Order limits	Sensitivity
	Policy A7 – West Cheltenham Development area: approximately 1,100 new residential properties (access partly within Order limits); also associated with 22/01817/OUT and 22/01107/OUT outline application for 1100 homes within the site (>150 residential properties threshold);	The West Cheltenham Development Area comprises land allocated within Policy A7 of the JCS for the development of approximately 1,100 residential properties within the JCS Plan period. The access to the allocation is within the Order limits, to the south of the B4634. There is also an outline planning application awaiting determination – 22/01817/OUT and 22/01107/OUT – for the construction of 1100 properties. Development of this site would exceed 150 residential properties, which determines the sensitivity category.	**Y**			Very high
	20/00759/FUL – Swindon Farm (Elms Park), Tewkesbury Road Gloucestershire Demolition of a residential property and the erection of 266 residential properties (Use Class C3), new vehicular and pedestrian access off Manor Road, attenuation basin and ancillary infrastructure.	This application relates to land that is allocated within Policy A7 of the JCS. The proposal is for 266 residential properties, with access from the A4019 to be gained along Manor Road, through the Gallagher Retail Park. The site is approximately 250m from the Order limits, to the north of the A4019. Development of this site would exceed 150 residential properties, which determines the sensitivity category.		**Y**		Very high
	Policy SD5 Safeguarded land to the north-west of	The safeguarded site north-east of M5 Junction 10 is land identified in the JCS under Policy SD5 as suitable to meet future development needs,	**Y**			Very high

Receptor Type and total within study area (approx. count)	Receptor name	Description	Within Order limits	Within 250m of Order limits	250m – 500m of Order limits	Sensitivity
	Cheltenham – North east of M5 Junction 10: number of residential properties unknown but anticipated to provide at least 2,000 new residential properties (western and southern edges of site boundary within the Order limits) (>150 residential properties threshold)	beyond the JCS plan period. There is no defined residential property capacity within the JCS, but the assumption used for the purposes of this ES, based on the site area, is that at least 2,000 new residential properties may be accommodated. The western and southern edges of the site are within the Order limits. Development of this site would exceed 150 residential properties, which determines the sensitivity category.				
	Uckington (<30 residential properties)	The settlement of Uckington is in the north-east of the population study area. There are less than 30 residential properties here. The small size of this receptor cluster would typically be noted as being of medium sensitivity to change; however, this is within an area where the number of households is expected to increase by several thousand due to strategic planning policy (potentially within the 16-25% increase noted in the DMRB LA112 environmental value (sensitivity) descriptions), thus the sensitivity of the receptor has been elevated.		**Y**		High
	22/01163/FUL – Uckington Farm: Demolition of agricultural buildings and erection of 16 residential properties, creation of access,	This is an application on an unallocated site, at Uckington Farm adjacent to land allocated within Policy A7 of the JCS and adjacent to the Order limits. The small size of this receptor cluster would typically be noted as being of medium sensitivity to change; however, this is within an area where the number of households is		**Y**		High

Receptor Type and total within study area (approx. count)	Receptor name	Description	Within Order limits	Within 250m of Order limits	250m – 500m of Order limits	Sensitivity
	landscaping, and associated works (< 30 residential properties threshold)	expected to increase by several thousand due to strategic planning policy (potentially within the 16-25% increase noted in the DMRB LA112 environmental value (sensitivity) descriptions), thus the sensitivity of the receptor has been elevated.				
	Residential properties adjacent to M5 Junction 10 at Stanboro Lane and adjacent A4019 (< 30 residential properties threshold)	There is a small number of residential properties clustered just beyond the Order limits close to the M5 Junction 10. This includes properties at Stanboro Lane and fronting or adjacent to the carriageway of the A4019. There are less than 30 residential properties here, which determines the sensitivity category.		**Y**		Medium
	Informal Traveller site adjacent M5, north of Junction 10 (< 30 caravans estimated)	There is land occupied informally by travellers – referred to as the informal Traveller site – adjacent to the southbound carriageway of the M5, approx. 250 m to the north of the existing M5 Junction 10. There appear to be less than 30 separate caravans within the site curtilage. The nature of the use means that occupation levels can change. There are less than 30 residential properties here, which determines the sensitivity category.		**Y**		Medium
	Properties adjacent B4634 (< 30 residential properties threshold)	There is a small number of properties located on the B4634, which links the west of Cheltenham to Staverton via Hayden. These properties are located adjacent to the Order limits. There are less than 30 residential properties here, which determines the sensitivity category.		**Y**		Medium

Receptor Type and total within study area (approx. count)	Receptor name	Description	Within Order limits	Within 250m of Order limits	250m – 500m of Order limits	Sensitivity
	Properties adjacent to M5 and Withybridge Lane, south of Junction 10 and south of A4019 (< 30 residential properties threshold)	There is a small number of residential properties clustered just beyond the Order limits close to the M5 Junction 10 (approximately 90 m from the Order limits at the closest point). This includes properties at Withybridge Lane to the south of the M5 Junction 10 and fronting or adjacent to the westbound carriageway of the A4019. There are less than 30 residential properties here, which determines the sensitivity category.		**Y**		Medium
	22/01272/FUL – Pigeon House Farm: Full application for the removal of an agricultural building and the erection of 4 residential properties and associated access.	This is an application on an unallocated site in the village of Uckington, at Pigeon House farm fronting the Green. It is approximately 60m from the Order limits. It updates application 18/01218/OUT. There are less than 30 residential properties here, which determines the sensitivity category.		**Y**		Low
	22/00474/FUL – Douglas Equipment: Full application for the demolition of existing buildings and erection of 71 residential properties, including access, car parking, landscaping, and associated works (>30-150 residential properties threshold)	This is an application on an unallocated site within the Springfield community of Cheltenham, approximately 260m to the east of the Order limits. Development of this site would represent a change of use and deliver 71 residential properties, which determines the sensitivity category.		**Y**		High

Receptor Type and total within study area (approx. count)	Receptor name	Description	Within Order limits	Within 250m of Order limits	250m – 500m of Order limits	Sensitivity
	22/01377/FUL – land at Manor Farm: The erection of up to 9 residential properties at Manor Farm (<30 residential properties threshold.)	This is an application on an unallocated site located within Stoke Orchard, approximately 92m from the motorway, north of Junction 10. Development of the site would deliver 9 residential properties, which determines its sensitivity.		**Y**		Low
	21/00872/REM – Phase 1, land at Old Gloucester Road: Various successive applications for approval of reserved matters pursuant to outline planning permission ref. 17/01411/OUT for residential development of up to 90 residential properties. The revised proposals are for 85 residential properties (March 2023) (>30-150 residential properties threshold).	This application relates to a parcel of land within the south-western portion of the larger Policy HD8 Strategic Site – land to the north of the B4634 , which is a Cheltenham Plan site allocation for 175 homes (11.3 ha.) The proposal is for 85 residential properties. The site is approximately 311m from the Order limits, south of the A4019. Development of this site in accordance with the planning application would deliver 85 residential properties, which determines the sensitivity category.		**Y**		High
	Voyage Care: Orchard Leigh: eight residential properties	Voyage Care: Orchard Leigh is an assisted living home for up to eight residents with mild to severe learning disabilities. It is situated approximately 160m from the Order limits, to the		**Y**		Medium

Receptor Type and total within study area (approx. count)	Receptor name	Description	Within Order limits	Within 250m of Order limits	250m – 500m of Order limits	Sensitivity
		east. There are less than 30 residential properties here, which determines the sensitivity.				
	North-west Cheltenham (>150 residential properties threshold)	There are areas of established existing housing on the north-west fringes of the Cheltenham urban area, beyond the eastern extents of the Order limits. There are over 150 houses in this part of the settlement, within the population study area, which determines the sensitivity.			**Y**	Very high
	Boddington (<30 residential properties threshold)	The community of Boddington is towards the west of the population study area, approximately 500 m from the Order limits. There are estimated to be less than 30 residential properties in this location, which determines the sensitivity.			**Y**	Medium
	23/00328/OUT – Knightsbridge Nurseries: Outline application for up to 46 affordable residential properties with all matters reserved except access (>30-150 residential properties threshold).	This is an application on site of Knightsbridge Nurseries (a business receptor), an unallocated site approximately 379m to the west of the Order limits. Development of this site would result in the planned permanent closure of the Nursery to deliver 46 affordable residential properties, which determines the sensitivity category.			**Y**	High
	22/02172/FUL – Pilgrove Cottage: Full application for 4 detached 5 – bedroom houses with internal	This application is on an unallocated site adjacent to Old Gloucester Road, approximately 432m from the Order limits. Development of this site would deliver four residential properties, which determines the sensitivity category.			**Y**	Low

Receptor Type and total within study area (approx. count)	Receptor name	Description	Within Order limits	Within 250m of Order limits	250m – 500m of Order limits	Sensitivity
	garages, 3 external parking spaces and external landscaping (<30 residential properties threshold).					
	Wentworth Court (dementia-only nursing home)	Wentworth Court in Cheltenham is a dementia only nursing home. It is located on the north-western edge of Cheltenham, approximately 460m from the Order limits. The facility is registered to provide accommodation for 62 people living with a diagnosis of dementia, which determines the sensitivity.			**Y**	High
	Knightsbridge Lodge (Nursing home for adults over 65 years)	Knightbridge Lodge is a nursing home for adults over 65 years. It is located on the A4019, north-west of Junction 10, approximately 488m from the Order limits. The facility is registered to provide accommodation for 22 residents over the age of 65 years. The size of this receptor would typically be noted as being of medium sensitivity to change based on the occupancy of the receptor; however, as residents of this receptor are considered to be vulnerable, the sensitivity of the receptor has been elevated.			**Y**	High
	Properties to the west of Elmstone Hardwicke (< 30 residential properties threshold)	The community of Elmstone Hardwicke is to the north of the study area, approximately 400 m from the Order limits. There are estimated to be less than 30 residential properties in this location, which determines the sensitivity.			**Y**	Medium
	23/00354/OUT – Home Farm	This application relates to land that is allocated within Policy A7 of the JCS. The proposal is for			**>1km** *(with*	Very High

Receptor Type and total within study area (approx. count)	Receptor name	Description	Within Order limits	Within 250m of Order limits	250m – 500m of Order limits	Sensitivity
	Outline application for the erection of up to 180 residential units, including provision of vehicular and pedestrian access, green infrastructure and associated works. (>150 residential properties threshold)	180 residential units with access from Quat Goose Lane, north of Swindon Village. The site is approximately 1138m from the Order limits, to the north of the A4019. Development is included due to allocation within the JCS. Development of this site would exceed 150 residential properties, which determines the sensitivity category.			*Policy allocation extending from partly within Order limits)*	
	21/02832/OUT – Lansdown Industrial Estate: Outline application for the development of the northern part of Lansdown industrial estate for up to 215 residential properties with associated access roads, parking and public open space following the demolition of the existing buildings (>150 residential properties threshold).	This application relates to land that is allocated for mixed-use development within Policy H2 of Cheltenham Local Plan. The land is located on the site of Lansdown industrial estate, Gloucester Road, approximately 1700m from the Order limits. Development of this site in accordance with the planning application would involve demolition of industrial premises to enable delivery of 215 residential properties – this exceeds the 150 residential property threshold in DMR LA112, which determines the sensitivity category.			**>1km** *(with Policy allocation adjacent to parts of the affected route network)*	Very High
Community land and assets 6 community facilities	**Uckington & Elmstone Hardwicke Village Hall** (140 m from Order limits)	The Uckington and Elmstone Hardwicke Village Hall is located towards the east of the study area, approximately 140m from the Order limits. The A4019 is considered likely to create some level of severance between the parts of		**Y**		Medium

Receptor Type and total within study area (approx. count)	Receptor name	Description	Within Order limits	Within 250m of Order limits	250m – 500m of Order limits	Sensitivity
3 green spaces 2 places of worship 1 emergency services facility 1 school 1 nursery/creche 3 healthcare services		Uckington to the south, albeit that there is crossing provision. Access to potential users to the north does not have severance of this type. There are limited alternative facilities at a local level in neighbouring villages and Cheltenham. It is anticipated that for the majority of the local catchment population, usage is likely to be reasonably frequent (e.g. monthly).				
	The Cheltenham Civil Service Tennis and Football Clubs (40 m from Order limits)	The Cheltenham Civil Service Tennis and Football Clubs are located on the north-western edge of Cheltenham, approximately 40m from the Order limits to the south of the A4019. The A4019 is considered likely to create some level of severance between the site and its potential catchment, albeit that there is crossing and public transport provision. Access to potential users to the south does not have severance of this type. There are alternative football pitches in the local area, albeit that these tend to be affiliated to different clubs or groups. Alternative tennis provision is only available in the wider local planning authority area. Consultation with the Director of the facility indicates that the assets are used frequently (i.e. weekly) by the wider Cheltenham community and that equivalent alternative facilities are not available locally.		**Y**		High
	All Saints Academy: community use (180m from Order limits)	The sports facilities at this educational facility are available to hire, south of the A4019. The A4019 and B4634 is likely to create some level of severance between the site and its potential catchment. The AstroTurf is used by		**Y**		Medium

Receptor Type and total within study area (approx. count)	Receptor name	Description	Within Order limits	Within 250m of Order limits	250m – 500m of Order limits	Sensitivity
		Cheltenham Town Football Club on a regular basis, as well as other hirers. Holiday and after school clubs are hosted at the site. The holiday camp has an intake of 20 to 60 students per day from 8:30 to 17:00 at the latest count and runs during all school holidays. It is anticipated that this receptor is likely to be used daily by the majority of the population within western Cheltenham. There are limited school club and holiday camp facilities available at a local level.				
	Energie fitness (230m from Order limits)	This is a private gym facility at Blaisdon Way commercial premises. The B4634 is likely to create some level of severance between the site and potential catchment. It is anticipated this receptor is likely to be used frequently (weekly) by users and by less than 50% of the community. There are alternative gyms within the local community.		**Y**		Low
	Sports Direct Fitness (17m from Order limits)	This is a private gym facility adjacent to an Aldi supermarket at the A4019 Gallagher junction. The receptor includes general gym facilities and classes as well as a swimming pool and sauna. The A4019 is likely to create a level of severance between the site and its wider catchment area (Uckington) albeit that there are crossing provisions. The receptor is anticipated to be used frequently (weekly) by users and by less than 50% of the community. There are alternative gyms within the local community.		**Y**		Low

Receptor Type and total within study area (approx. count)	Receptor name	Description	Within Order limits	Within 250m of Order limits	250m – 500m of Order limits	Sensitivity
	Greensteps, National Star (8 m from Order limits)	This is an enterprise centre; a facility run by National Star College and located adjacent to Bailey's Nurseries. National Star College provides specialist further education and residential services for people with disabilities and acquired brain injuries. The main campus is located in Ullenwood, Cheltenham. Activities for students at this receptor include upcycling furniture, making homemade cards and gifts, and gardening projects. The centre also hosts annual student recruitment days. This receptor is approximately 8m from the Order limits and is likely to be used on a weekly to monthly basis by users and by less than 50% of the community. There are no alternatives within the local community and the A4019 is likely to create a level of severance between the site and its catchment area.		**Y**		Medium
	Hayden Road Allotments (32m from Order limits)	Hayden Road Allotments are managed by CBC with approximately 180 plots and 3.4ha in size. The receptor is adjacent to the B4634, approximately 32m from the Order limits and lies within a site allocated for development under Policy HD8 of the JCS. The allotments are open 24 hours a day and are likely to be used frequently (daily – weekly) by users and by less than 50% of the community. There is a 'very short waiting list', between a few weeks to a few months, for an allotment and most residential properties in the area have garden space. However, given the size of the receptor, relative scarcity of alternative allotments and likely wide		**Y**		Medium

Receptor Type and total within study area (approx. count)	Receptor name	Description	Within Order limits	Within 250m of Order limits	250m – 500m of Order limits	Sensitivity
		catchment area, this receptor is of a medium sensitivity to change.				
	George Reading Play Area (267m from Order limits)	George Reading Play Area includes green space and playground equipment within the residential area of Arle, south of the A4019. This receptor is approximately 1.1ha in size and 267m from the Order limits. The receptor is likely to be used frequently (weekly) by nearby households and by less than 50% of the community. There is limited severance between the receptor and close residential properties. There are alternative and accessible playground areas within adjacent communities.			**Y**	Low
	Pilgrove Way Playground (350m from Order limits)	Pilgrove Way Playground includes green space and playground equipment. The receptor is located in Springbank on Pilgrove Way, approximately 0.6 ha in size and 350m from the Order limits. The receptor is likely to be used frequently (weekly) by nearby households and by less than 50% of the community. There are alternative and accessible playground areas within adjacent communities.			**Y**	Low
	The Circle of Light place of worship (280m from Order limits)	The Circle of Light place of worship is located north of Uckington, approximately 280 m from the Order limits. The A4019 is considered likely to create some level of severance between the parts of Uckington to the south, albeit that there is crossing provision. There are limited alternative facilities at a local level. This receptor is likely to be used frequently (weekly-monthly) by the majority of the community within which it			**Y**	Medium

Receptor Type and total within study area (approx. count)	Receptor name	Description	Within Order limits	Within 250m of Order limits	250m – 500m of Order limits	Sensitivity
		sits, including Uckington and the various rural settlements located in and around the study area.				
	St Mary Magdalene Church (500m from Order limits)	St Mary Magdalene Church is located in Boddington to the west of the study area, approximately 500 m from the Order limits. This receptor is likely to be used by the majority of the community including Boddington and the various rural settlements located in and around the study area. There are limited alternative facilities available at a local level. Consultation has confirmed that the receptor is used regularly for one service every Sunday morning and weekday evening services on the 2nd Wednesday and 4th Thursday of each month. The congregation travels from surrounding parishes in the benefice: Norton, The Leigh, Down Hatherley; Sandhurst, Twigworth and Staverton. Others also travel from Tewkesbury, Cheltenham, Gloucester, and Churchdown. The receptor is also used for bring and share lunch events on notable occasions, and it holds 10-12 special services each year, for events such as baptisms, weddings and funerals. The church is also working on a strategic plan to make the church more usable and are hoping to arrange more weekday services and a drop-in café in the near future.			**Y**	Medium
	West Cheltenham Fire Station (partly within Order limits)	West Cheltenham Fire Station is partly within and adjacent to the Order limits. There are two access routes to this facility – emergency	**Y**			High

Receptor Type and total within study area (approx. count)	Receptor name	Description	Within Order limits	Within 250m of Order limits	250m – 500m of Order limits	Sensitivity
		vehicles access and egress directly onto the A4019 under an emergency red light system (i.e. there is no severance for this movement); and staff and visitor access is separate to the east, directly onto the A4019 (not under lights and therefore subject to some degree of severance). The asset is not likely to be used frequently by the wider Cheltenham community as it is only infrequently used for community activities (e.g. exhibitions or events); however, when services are required there will be an acute need for access/egress to be unimpeded and the service provides a full-time crew cover. There is an alternative station south-east of Cheltenham but no alternatives for communities north of the Scheme. A community receptor with comparable characteristics would typically be of a medium sensitivity to change; however, due to the nature of the facility (i.e. delivering emergency services to the whole of the local community on a demand-responsive basis) the receptor is being considered as of high sensitivity to change.				
	All Saints' Academy: educational facility (180m from Order limits)	This All Saints' Academy is a secondary school with 114 pupils aged 11 -19 years. The Academy also hosts the Polish Language School in Cheltenham which offers Polish language lessons for primary school aged children on Saturdays. The A4019 and B4634 is likely to create some level of severance between the receptor and its potential catchment, east of the Academy. There		**Y**		Medium

Receptor Type and total within study area (approx. count)	Receptor name	Description	Within Order limits	Within 250m of Order limits	250m – 500m of Order limits	Sensitivity
		are limited alternative faith educational facilities and Polish language schools within the study area. The receptor is used frequently (daily) and by less than 50% of the community.				
	Independent Living Centre (193 m from the Order limits) NHS and GCC clinic and wheelchair assessment centre.	Independent Living Centre is a clinic provided by the NHS and GCC. The centre offers a stroke early supported discharge service, integrated community teams who provide care for people in their place of residence or in the community and Gloucestershire Wheelchair Assessment service. The facility is likely to be used reasonably frequently (monthly) by users and by less than 50% of the community due to its specialist services. There are alternative clinics in the area, however there are no known alternatives to the wheelchair or stroke services that are available at this clinic. The A4019 is likely to create some level of severance to access the receptor.		**Y**		Medium
	Boots Pharmacy at Gallagher Retail Park (170m from the Order limits)	Boots Pharmacy is located in Gallagher Retail Park approximately 170 m from the Order limits. It is likely to be used by the majority of the community which it sits in, particularly for those in Uckington and various rural settlements as it is the closest dispensing pharmacy. This receptor is likely to be used infrequently (monthly or less frequent) by users and by less than 50% of the community as there are alternative services available within Springbank and other parts of Cheltenham.		**Y**		Low

Receptor Type and total within study area (approx. count)	Receptor name	Description	Within Order limits	Within 250m of Order limits	250m – 500m of Order limits	Sensitivity
	Giggles Nursery/creche (595m from Order limits)	Giggles Nursery is located at Springbank Resource Centre and provides day care for babies and toddlers aged 0 – 5 years. At this nursery there are 38 places and approximately 67 children on roll. It also offers a Holiday Club for children aged 4 -8 years old during school holidays. It is the closest provision of this type of facility to the Order limits, approximately 595 m distant. The A4019 is likely to create some level of severance to access the receptor and there are limited alternatives to this type of facility at a local level, particularly for those in various rural communities east and north of the Scheme. The receptor is likely to be used frequently (daily to weekly) and by less than 50% of the community.				Medium
	Springbank Surgery (600m from Order limits)	Springbank Surgery is located at Springbank Resource Centre. It is the closest doctors' surgery to the Order limits, approximately 600 m, and to residents of the study area. It is likely to be used by the community which it sits in, Uckington and various rural settlements located in and around the study area. This receptor is likely to be used infrequently (monthly or less frequent) by users and by less than 50% of the community as there are alternative services available near to Gloucestershire College and within Cheltenham.				Low
	Cheltenham Pharmacy (within 600m of the Order limits)	Cheltenham Pharmacy is located at Springbank Resource Centre adjacent to Springbank Surgery. It is likely to be used by the community which it sits in, Uckington and various rural				Low

Receptor Type and total within study area (approx. count)	Receptor name	Description	Within Order limits	Within 250m of Order limits	250m – 500m of Order limits	Sensitivity
		settlements located in and around the study area. This receptor is likely to be used infrequently (monthly or less frequent) by users and by less than 50% of the community as there are alternative services available at Boots Pharmacy in Gallagher Retail Park and within Cheltenham				
	NHS Gloucestershire Community Dental Services (within 600 m of the Order limits)	Gloucester Community Dental Services is located at Springbank Resource Centre. It is the closest dental practice to the Order limits and to residents of the study area. It is likely to be used by the community which it sits in, Uckington and various rural settlements located in and around the study area. This receptor is likely to be used infrequently (monthly or less frequent) by users and by less than 50% of the community as there are alternative services available within and near to Gloucestershire College and within Cheltenham.				Low
Development land and business 143 businesses, plus 2 planned premises. 7 business locations (3 retail parks, 1 business/trading estate and 3 small business premises) and 68 hectares of	**Gloucestershire Detailing valeting service**	Gloucestershire Detailing valeting service occupies premises that form part of the Sheldon Nurseries complex, to the north-west of M5 Junction. The premises are within the Order limits, on land that falls in the permanent footprint for the Scheme. The premises are under one hectare in size, which determines the sensitivity category.	**Y**			Medium
	Sheldon Nurseries horticultural nurseries	Sheldon Nurseries horticultural nursery premises are to the north-west of M5 Junction 10. The site comprises a series of industrial premises available for rental but is currently not	**Y**			Medium

Receptor Type and total within study area (approx. count)	Receptor name	Description	Within Order limits	Within 250m of Order limits	250m – 500m of Order limits	Sensitivity
business/ employment locations safeguarded in policy	(commercial premises for tenancy)	trading. The premises are within the Order limits, on land that falls in the permanent footprint of the Scheme. The premises are under one hectare in size, which determine its sensitivity category.				
	Bailey's Nurseries (partly within the permanent land take for the Scheme in the Order limits, to the west of Gallagher Retail Park).	Bailey's Nurseries is a plant nursery located adjacent to the A4019 / B4634 crossroad junction. The site is partially within the Order limits. This receptor is approximately 1.2ha which determines its sensitivity category.	**Y**			High
	Gallagher Retail Park (partly within Order limits at south-western edge, extending adjacent to the A4019 and then north from the Order limits)	A number of businesses are located at Gallagher Retail Park, on the north-western edge of Cheltenham, which is marketed as Cheltenham's primary out-of-town shopping destination. Current retail occupiers include Boots, DFS, Dreams, Hobbycraft, Homesense, Majestic wine, Mamas and Papas, Matalan, Next (clothing and home), Oak Furnitureland, Pets at Home, Sofology, Sports Direct, Tapi Carpets, the food Warehouse, Sainsburys and Virgin Holidays and there are three food and drink outlets – Costa, Greggs, and Ground. A small part of the retail park, comprising the boundary fence and some planting along the south-western edge at the rear of Sainsburys, is within the Order limits and permanent footprint of the Scheme. This receptor is approximately 8.6 hectares which determines its sensitivity category.	**Y**			Very high

Receptor Type and total within study area (approx. count)	Receptor name	Description	Within Order limits	Within 250m of Order limits	250m – 500m of Order limits	Sensitivity
	Aldi and business premises: includes supermarket, car dealership and service centre and private gym (partly within permanent land take for the Scheme in Order limits, to the south-west of Gallagher Retail Park, accessed from B4634)	At least three businesses are located to the south-west of Gallagher Retail Park, accessed from the B4634. An Aldi supermarket occupies the corner of the site, bordering both the A4019 and B4634. There is a large warehouse building behind, part of which is occupied by Bristol Street Motors Ford dealership and Service Centre and part is a private gym facility – Sports Direct Fitness (also noted as a community facility). A small part of the curtilage of the site, comprising the boundary fence and adjacent verge as they border the A4019 and B4634, is within the permanent footprint of the Scheme. This receptor is approximately 2.1 hectares in size which determines its sensitivity category.	**Y**			High
	Gloucester Old Spot public house (adjacent to the Order limits)	The Gloucester Old Spot public house is situated to the north-west of M5 Junction 10, just to the west of the Order limits and fronting the A4019. The premises are under one hectare in size, which determines its sensitivity category.		**Y**		Medium
	Stanboro Cottage Fish Farm (adjacent to the Order limits)	Stanboro Cottage Fish Farm is situated to the north-west of M5 Junction 10, just to the west of the Order limits and fronting the A4019. The premises are under one hectare in size, which determines its sensitivity category.		**Y**		Medium
	Elmstone Business Park (105 m from Order limits)	There are at least five businesses located at Elmstone Business Park, with four of the businesses located within a large building known as the Phoenix House. The receptor is located west of the M5 Junction 10,		**Y**		Medium

Receptor Type and total within study area (approx. count)	Receptor name	Description	Within Order limits	Within 250m of Order limits	250m – 500m of Order limits	Sensitivity
		approximately 105m from the Order limits, and is approximately 0.7ha in size, which determines its sensitivity category.				
	Blaisdon Way commercial premises (180 m from Order limits)	There are several warehouses located at Blaisdon Way on the western edge of Cheltenham. Warehouses are available to let with some currently occupied by Energie fitness, a private gym (noted in the community facilities); M5 Leisure, a motorhomes and campervan company; GB Liners Removal and Storage company and Max Self-Storage, a storage company. This receptor is approximately 2.6 hectares in size which determines its sensitivity category.		**Y**		High
	The House in the Tree public house (adjacent to the Scheme at B4634/Withybridge Lane)	The House in the Tree public house is located on the B4634 / Withybridge Lane junction adjacent to the Order limits. The business is part of the Stonegate Group, operated locally by a landlord. It includes an animal petting area marketed online, an attraction which would appeal to younger patrons. This receptor is under one hectare in size which determines its sensitivity category.		**Y**		Medium
	Junction 10 breakfast van mobile take away food outlet – trailer based (adjacent, typically sited in A4019 layby on westbound	The Junction 10 breakfast van is run from a trailer capable of being towed. It is marketed as being located at 'Uckington Lay-By Junction 10' and typically occupies part of the westbound carriageway lay by of the A4019, on the approach to M5 Junction 10 from the east. An active business on a site under 1 hectare would typically be categorised as medium sensitivity.		**Y**		Low

Receptor Type and total within study area (approx. count)	Receptor name	Description	Within Order limits	Within 250m of Order limits	250m – 500m of Order limits	Sensitivity
	carriageway, east of M5 Junction 10)	However, as a mobile business it cannot be considered as likely to be affected by the Scheme in the same manner as a built premises with a fixed position would be. It is therefore considered to be of low sensitivity to change.				
	Comfy Campers camper van hire company (adjacent, on A4019)	Comfy Campers camper van hire company is located on the A4019 west of Uckington, adjacent to the Order limits. This business is under one hectare in size which determines its sensitivity category.		**Y**		Medium
	Cheltenham Auto Services repair shop (adjacent, on A4019)	Cheltenham Auto Services vehicle repair shop is located on the A4019 west of Uckington, adjacent to the Order limits. This business is under one hectare in size which determines its sensitivity category.		**Y**		Medium
	Distinctive Ironwork blacksmith (adjacent, on A4019)	Distinctive Ironwork blacksmith is located on the A4019 west of Uckington, adjacent to the Order limits. This business is under one hectare in size which determines its sensitivity category.		**Y**		Medium
	Premier Inn Cheltenham North West and eateries (30 m from Order limits)	A Premier Inn Cheltenham and two eateries, a Beefeater pub and an independent restaurant, are located on the A4019, south of the Gallagher Retail Park. The receptor is approximately 0.5ha in size which determines its sensitivity category.		**Y**		Medium
	Arle Nursery (143 m from Order limits)	Arle Nursery is a wholesale plant nursery run by CBC which grows plants for the borough's gardens and has periodic plant sales. The receptor is located adjacent to the B4634 and		**Y**		Medium

Receptor Type and total within study area (approx. count)	Receptor name	Description	Within Order limits	Within 250m of Order limits	250m – 500m of Order limits	Sensitivity
		Hayden Road Allotments, and lies within an area allocated for development under Policy HD8 of the Cheltenham Plan. The receptor is approximately one hectare in size which determines its sensitivity category.				
	Cheltenham Fencing (225m from Order limits)	Cheltenham Fencing is a fence supply shop located on the B4634 approximately 225m from the Order limits. This receptor is approximately 0.2ha in size which determines its sensitivity category.		**Y**		Medium
	Applegreen filling station and business premises (230m from Order limits)	The filling station premises located adjacent to the A4019 includes a car dealership, motorbike dealership and restaurant. The receptor is approximately 0.2ha in size which determines its sensitivity category.		**Y**		Medium
	Policy A4 – North West Cheltenham Development Area employment land parcels partly adjacent to Order limits	The North West Cheltenham Development Area comprises land allocated within Policy A4 of the JCS for the development of approximately 4,285 residential properties, plus a 10-hectare B-class office park and 13 hectares of predominantly non B-class employment generating land within the JCS Plan period. The access and south-western edge of the allocation as a whole is within the Order limits, to the north of the A4019 and west of Gallagher Retail Park – an indicative land use plan places the employment element adjacent to the Order limits. The land allocation for employment determines its sensitivity, however, as the site exceeds 5 ha of proposed employment land and is partly		**Y**		Very high

Receptor Type and total within study area (approx. count)	Receptor name	Description	Within Order limits	Within 250m of Order limits	250m – 500m of Order limits	Sensitivity
		adjacent to the Order limits the sensitivity is considered to be of a very high sensitivity to change.				
	Policy A7 – West Cheltenham Development Area partly adjacent to Order limits and also associated with 22/01817/OUT and 22/01107/OUT outline application for 700sqm of business space.	The West Cheltenham Development Area comprises land allocated within Policy A7 of the JCS for mixed use development including 45 hectares of B-class led employment development. The land allocation for employment determines its sensitivity, however, as the site exceeds 5 ha of proposed employment land and is partly adjacent to the Order limits the sensitivity is considered to be of a very high sensitivity to change. Part of the site is associated with 22/01817/OUT and 22/01107/OUT outline application for a convenience store (450sqm) and café/work space (250sqm).		**Y**		Very high
	20/00213/FUL – Manor Farm: The erection of 3 No. B1 and B8 units	The status of this as proposed development on an unallocated site providing employment with planning permission determines its sensitivity.		**Y**		Low
	20/02132/FUL – Warners of Cheltenham: The erection of 12 no. business incubator units	The status of this as proposed development on an unallocated site providing employment with planning permission determines its sensitivity.		**Y**		Low
	21/02120/FUL – Gallagher Retail Park: The erection a	The status of this as proposed development on an unallocated site providing employment with planning permission determines its sensitivity.		**Y**		Low

Receptor Type and total within study area (approx. count)	Receptor name	Description	Within Order limits	Within 250m of Order limits	250m – 500m of Order limits	Sensitivity
	restaurant unit with drive-through lane and associated car parking, layout, and landscaping amendments					
	Car wash and valeting service, Gallagher Retail Car Park (125m form the Order limits)	A waterless hand car wash and valeting service with associated canopies and portacabin approximately 12 car parking spaces located in the south-eastern corner of the Gallagher Shopping Centre car park, adjacent to the Manor Road roundabout. This receptor is under one hectare in size, which determines its sensitivity category.		**Y**		Medium
	Knightsbridge Nurseries (379m from Order limits)	Knightsbridge Nursery (Yard House Plants) is located on the A4019, west of M5 Junction 10. This receptor is approximately 1.4 hectares in size which determines its sensitivity. There is an outline planning application for housing on this Site, see receptor 23/00328/OUT. The approval of the planning application would result in the closure of this receptor which would be attributed to the third party development proposals rather than the Scheme.			**Y**	High
	Kingsditch Trading Estate (260m from Order limits)	A number of businesses are located on the western edge of the Kingsditch Trading Estate, approximately 260 m from the Order limits. This section of the business park is approximately 7.4 hectares in size, which determines its sensitivity category.			**Y**	Very High

Receptor Type and total within study area (approx. count)	Receptor name	Description	Within Order limits	Within 250m of Order limits	250m – 500m of Order limits	Sensitivity
	Holmedale Guest House (350m from Order limits)	Holmedale guest house is located on the B4634. This receptor is under one hectare in size, which determines its sensitivity category.			**Y**	Medium
	Gateway Retail Park (420m from Order limits)	At least three businesses are located at Gateway Retail Park, including Currys, Smyths Toys and Hillarys blinds shop. This receptor is located adjacent to the A4019/Princess Elizabeth Way roundabout, south of Kingsditch trading estate. This receptor is approximately 0.9ha in size which determines its sensitivity category.			**Y**	Medium
Walkers, cyclists, and horse riders (WCH) 151 PRoW intersect the study area	**Boddington Footpath 16 – ABO16** (passes underneath the M5)	Boddington Footpath 16 provides access between Boddington and Withybridge Lane. The footpath connects to a wider PRoW network connecting to South Uckington and West Cheltenham. This PRoW is likely to be used for recreation and to a lesser extent for commuters to access West Cheltenham. There are limited alternative routes available.	**Y**			High
	Uckington Footpath 11 – AUC11 (intersects the Scheme)	Uckington Footpath 11 provides access between Withybridge Lane and Moat Lane, South Uckington. The PRoW intersects the Order limits. This PRoW is likely to be used for recreation (daily) and to a lesser extent for commuters to access West Cheltenham. There is an	**Y**			High

Receptor Type and total within study area (approx. count)	Receptor name	Description	Within Order limits	Within 250m of Order limits	250m – 500m of Order limits	Sensitivity
		alternative route, Boddington Footpath 24, which also intersects the Scheme.				
	Cheltenham Circular Route (intersects the Order limits) (includes PRoW ref. AUC8, AUC14 and ABO25)	The Cheltenham Circular Route is a 25-mile route around Cheltenham, which is based on existing PRoW. The route intersects with the Order limits. The following PRoW form part of the Cheltenham Circular Route and are relevant to the Scheme PRoW ref. AUC8, AUC14 and ABO25. This route is promoted circular walk by CBC and has no formal designation but could be defined as a regional walking trail. There are no alternatives to this route and preservation of the route is required. The route crosses the A4019 which more than 16,000 vehicles use per day. The route is used frequently (daily) and used predominantly for recreation.	**Y**			Very High
	Boddington Footpath 24 – ABO24 (intersects the Scheme)	Boddington Footpath 24 provides access between Withybridge Lane and Boddington Bridleway 25, part of the Cheltenham Circular Footpath. The PRoW intersects the Order limits. This PRoW is likely to be used for recreation (daily) and to a lesser extent for commuters to access West Cheltenham. There are limited alternatives to this route.	**Y**			High
	Uckington Footpath 8 – AUC8 (part of the paths that form the Cheltenham Circular	Uckington Footpath 8 provides access between the A4019 north and east Uckington. The PRoW forms part of the Cheltenham Circular Footpath and intersects the Order limits.	**Y**			High

Receptor Type and total within study area (approx. count)	Receptor name	Description	Within Order limits	Within 250m of Order limits	250m – 500m of Order limits	Sensitivity
	Route) (intersects the Order limits)	This PRoW is likely to be used for recreation (daily) and there are limited alternatives to this route.				
	Boddington Footpath 26 – ABO26 (partly within Order limits)	Boddington Footpath 26 provides access between Hayden Farmhouse and the B4634. This PRoW is likely to be used for recreation and alternative routes are available.	**Y**			Medium
	Boddington Footpath 14 - ABO14 (intersects the Order limits)	Boddington Footpath 14 provides access between M5 Junction 10 and Boddington. This PRoW intersects the Order limits. This route is likely to be used for recreation and alternative routes are available.	**Y**			Medium
	Uckington Bridleway 1 – AUC1 (adjacent to the Order limits)	Uckington Bridleway 1 provides access between the A4019/Cheltenham Road and Elmstone Hardwicke. This PRoW is likely to be used for frequently and for recreation. There are limited alternatives to this route for equestrians.		**Y**		High
	Boddington Footpath 13 – ABO13 (intersects the Order limits)	Boddington Footpath 13 provides access between the A4019/Cheltenham Road and Boddington. This route is likely to be used for recreation and to a lesser extent for commuting to Elmstone Business Park. There are limited alternatives to this route.	**Y**			Medium

Receptor Type and total within study area (approx. count)	Receptor name	Description	Within Order limits	Within 250m of Order limits	250m – 500m of Order limits	Sensitivity
	Boddington Footpath 12 – ABO12 (intersects the Order limits)	Boddington Footpath 12 provides access between the A4019/Cheltenham Road and Boddington Lane. This route is likely to be used for recreation and to a lesser extent for commuting to Elmstone Business Park. There are limited alternatives to this route.	**Y**			Medium
	Uckington Bridleway 14 – AUC14 and Uckington Footpath 15 – AUC15 (AUC14 forms part of the paths that for the Cheltenham Circular Route) (80m and 18m, respectively, from the Order limits)	Uckington Bridleway 14 and Uckington Footpath 15 connect to Moat Lane and provide a circular route around Moat House, a Scheduled Monument with a moat. These routes are likely to be used frequently and for recreation. Uckington Bridleway 14 forms a key link in the bridleway network and there are limited alternatives to this route.		**Y**		Medium
	Cheltenham Footpath 1 – ZCH1 (intersects the Order limits)	Cheltenham Footpath 1 runs adjacent to the River Chelt and provides access between the B4634/Blaisdon Way commercial premises junction and PRoWs AUC1 and AC15 which connect to Moat Lane, South Uckington. This route is likely to be used frequently for recreation and to a lesser extent for commuters to access Blaisdon Way commercial premises and All Saints Academy.	**Y**			Medium
	Cheltenham Footpath 2 – ZCH2	Cheltenham Footpath 2 provides access between PRoW ZCH1 and the B4634/Pilgrove Way junction, in a southward direction running		**Y**		Medium

Receptor Type and total within study area (approx. count)	Receptor name	Description	Within Order limits	Within 250m of Order limits	250m – 500m of Order limits	Sensitivity
	(140m from the Order limits)	adjacent to the western boundary of Hyden Road Allotments and Arle Nursery. This route is likely to be used frequently for recreation. There are limited alternatives to this route.				
	Swindon Footpath 16 – CHS16 (200 m from the Order limits)	Swindon Footpath 16 crosses a field located close to the Gallagher Retail Park. This route is likely to be used for recreation.		**Y**		Medium
	Boddington Footpath 29 – ABO29 (adjacent to the Order limits)	Boddington Footpath 29 provides access between the B4634 and Hayden, a small settlement. This route is likely to be recreational and alternative routes are available.		**Y**		Medium
	Boddington Footpath 27 – ABO27 and Boddington Footpath 28 – ABO28 (19m and 150m respectively)	Boddington Footpath 27and 28 adjoin to separate parts of Boddington Footpath 29 and connect to different sections for the B4634. These routes are likely to be recreational routes and alternative routes are available.		**Y**		Medium
	Stoke Orchard Footpath 9 – ASO9	These WCH routes are within 250m of the M5, north of the M5 Junction 10 and the Scheme's study area. These routes are recreational routes in and around Hardwicke, Elmstone Hardwick and Stoke Orchard.		**Y**		Medium
	Stoke Orchard Footpath 13 –ASO13			**Y**		Medium
	Elmstone Hardwicke Footpath 5 – AEH5			**Y**		Medium
	Elmstone Hardwicke Bridleway 15–AEH15			**Y**		Medium
	Elmstone Hardwicke Footpath 16 –AEH16			**Y**		Medium

Receptor Type and total within study area (approx. count)	Receptor name	Description	Within Order limits	Within 250m of Order limits	250m – 500m of Order limits	Sensitivity
	Elmstone Hardwicke Footpath 17 –AEH17			**Y**		Medium
	Elmstone Hardwicke Footpath 18 –AEH18			**Y**		Medium
	Elmstone Hardwicke Footpath 20 –AEH20			**Y**		Medium
	Elmstone Hardwicke Bridleway 21-AEH21			**Y**		Medium
	Elmstone Hardwicke Bridleway 22- AEH22			**Y**		Medium
	Elmstone Hardwicke Footpath 19 –AEH19			**Y**		Medium
	Elmstone Hardwicke Footpath 20 – AEH20			**Y**		Medium
	Elmstone Hardwicke Footpath 23 – AEH23			**Y**		Medium
	Elmstone Hardwicke Bridleway 25-AEH25			**Y**		Medium
	Elmstone Hardwicke Footpath 26 -AEH26			**Y**		Medium
	Staverton Footpath 6 – AVS6	These WCH routes are within 250m of the M5, south of the M5 Junction 10 and the Scheme's study area. These are recreational routes in and around Hayden, Golden Valley, and Staverton.		**Y**		Medium
	Staverton Footpath 9 – ASV9			**Y**		Medium

Receptor Type and total within study area (approx. count)	Receptor name	Description	Within Order limits	Within 250m of Order limits	250m – 500m of Order limits	Sensitivity
	Staverton Footpath 10			**Y**		Medium
	Staverton Footpath 11 – AVS11			**Y**		Medium
	Staverton Footpath 12 – AVS12			**Y**		Medium
	Staverton Footpath 15 – AVS15			**Y**		Medium
	Staverton Footpath 18 – AVS18			**Y**		Medium
	Staverton Footpath 19 – AVS19			**Y**		Medium
	Staverton Footpath 20 – AVS20			**Y**		Medium
	Staverton Footpath 13 – ASV13	These WCH routes are within 250m of the M5, south of the M5 Junction 10. These footpaths are likely to be used for commuting between Staverton and Staverton Technology Park.		**Y**		High
	Staverton Footpath 17 – ASV17			**Y**		High

Agricultural land holdings

13.8.19. Agricultural land use is a mixture of grassland and arable, the latter including combinable and fodder crops. Historic Google Earth imagery indicates that some land is under long term grass, while other is under ley grass and arable rotations.

13.8.20. Twelve agricultural holdings will be permanently affected by the Scheme, as shown in Figure 13-4. For reasons of confidentiality the holdings are identified by a letter, not by their name or owner.

- Holding A, farmed by a lifetime tenant of GCC, is a 52.6 ha mainly grassland farm of **medium sensitivity**, producing beef cattle. There is one arable field east of the M5, accessed from the Elmstone to Hardwicke Road. Most of the farm is in a mid-tier Countryside Stewardship Scheme.
- Holding B is a 65 ha, mainly arable farm with a grass field around the house and is of **medium sensitivity**. The land and farm buildings are let on short term tenancies. There is a small area of woodland next to the M5 that is in receipt of Farm Woodland Scheme payments.
- Holding C is a 19.6 ha grassland farm of **medium sensitivity**, producing beef cattle and let on a short term tenancy.
- Holding D is a 10 ha mixed arable and grass unit of **medium sensitivity**.
- Holding E is a 70 ha arable farm of **medium sensitivity** farmed by a tenant. The farm is in a mid-tier Countryside Stewardship Scheme.
- Holding F is a 19 ha mainly arable farm of **medium sensitivity**.
- Holding G is a 46 ha arable farm of **medium sensitivity**.
- Holding H comprises 12 ha of arable land of **medium sensitivity** that, in future, is likely to be let to neighbouring farmers on short term tenancies.
- Holding I, owned by GCC, is a 49 ha grassland farm of **medium sensitivity**, extending from Withybridge Lane to West Cheltenham Fire Station, whose tenancy became vacant in September 2021.
- Holding J is in excess of 300 ha. It is a mainly arable farm of **medium sensitivity**, mostly west of the M5 but with two fields in the north east quadrant of Junction 10, accessed from the A4019 at Withy Bridge.
- Holding K is a 41 ha mixed arable and grass holding of **medium sensitivity**.
- Holding L is a single field of 4.25 ha in grass and arable rotations. This holding is of **medium sensitivity**.

13.8.21. At the eastern end of the Scheme, north of the A4019, access will be provided across agricultural land to the proposed Elms Park development. This will only be built if the development receives planning consent, in which case the land will cease to be agricultural and so the impacts on existing farming are not relevant to this ES.

Figure 13-4 - Agricultural holdings impacted

Figure provided in Appendix 13.1 (Application document TR010063/APP/6.15)

13.9. Effects assessment – Population

13.9.1. The assessment of likely effects, during construction and the first year of operation of the Scheme, on Population sub-topic receptors resulting from the Scheme are set out below. This is then considered against the sensitivity of the affected receptor to change in order to determine resultant effects and their likely significance.

13.9.2. The Scheme has been designed, as far as possible, to avoid and minimise impacts and effects on population through the process of design-development (refer to Chapter 3 - Assessment of Alternatives of this ES (Application document TR010063/APP/6.2) considering good design principles. This has led to the inclusion of embedded mitigation.

This term is defined within the DMRB LA 104 as 'Design measures which are integrated into a project for the purpose of minimising environmental effects'. These are set out in the Scheme description in Chapter 2 – The Scheme (Application document TR010063/APP/6.2). It is important to note that the mitigation hierarchy outlined in DMRB LA 112 has been followed during the design process.

13.9.3. For the purposes of this assessment, the embedded mitigation also includes best practice environmental control measures. Chapter 4 - Environmental Assessment Methodology (Application document TR010063/APP/6.2) explains that construction of the Scheme would be subject to measures and procedures defined within the Environmental Management Plan (EMP 1st iteration) (Application document TR010063/APP/7.3). This EMP includes a range of measures associated with mitigating potential environmental impacts during Scheme construction (e.g. for control of noise, vibration and minimising risks of contamination to air, land and water). Measures detailed within the EMP would be developed into the EMP 2nd iteration (Application document TR010063/APP/7.3) refined during the construction stage for the consented project, in advance of construction, which would be prepared and implemented by the appointed Principal Contractor (PC). The EMP would set out the environmental mitigation requirements during the Scheme construction and also the project level expectations on how the Scheme would be constructed in accordance with DMRB LA120 Environmental Management Plans.

13.9.4. Key embedded mitigation measures for air, noise, and visual impacts during construction of the Scheme are outlined in Chapter 5 - Air Quality (Application document TR010063/APP/6.3), Chapter 6 - Noise and Vibration (Application document TR010063/APP/6.4), Chapter 9 - Landscape and Visual (Application document TR010063/APP/6.7) chapters of this ES. Embedded mitigation measures for population are outlined later in this chapter (Section 13.10), which includes a composite list of all embedded mitigation measures and Scheme design that are relevant to the population assessment (Table 13-19).

13.9.5. The assessment of population effects assumes that all of the embedded mitigation measures are in place, prior to forming a judgement about the magnitude and significance of effects – this relates to Step 1 of the population assessment methodology outlines in Section 13.5 and is referred to in the concluding parts of the assessment tables as the ‘main assessment’ (as opposed to the ‘residual effects assessment’).

13.9.6. The following section presents the assessment findings in tabular form. They first consider the impacts of the Scheme in light of design and embedded mitigation (the main assessment), cross-referring to the reference numbers provided in Table 13-19 of Section 13.10, which also correlate to those contained in the REAC (application document TR010063/APP/7.4). Where the main assessment highlights the need for essential mitigation to supplement the embedded mitigation, this is included within the assessment tables. A conclusion is then drawn about the residual effects of the Scheme, which takes account of the Scheme design, the embedded mitigation, and the essential mitigation relevant to the specific impacts being considered. This is undertaken for the construction phase first, then the operational phase before moving through to the next sub-topic.

13.9.7. On the basis of the above, the summary tables are used to document the assessment steps for named receptors in the following way:

- Name of receptor.
- Impact type.
- Sensitivity of receptor.
- Impact magnitude.
- Embedded mitigation, cross referenced to Section 13.10.
- Main assessment score, which relates to Step 1 of the assessment of effects (i.e. considering the effects resulting from the Scheme and embedded mitigation), supported by a description.
- Essential mitigation (if necessary and/or feasible), written in full and also cross-referenced to Section 13.10.
- Residual effects assessment, which indicates any change in assessment outcome

once essential mitigation is also taken into account. This is the conclusion of Step 2 of the assessment of effects.

13.9.8. The overall conclusions about the effects of the Scheme on the population draw from the residual effects assessment.

Private property and housing

Construction

13.9.9. The assessment of the level of construction impacts and resultant effects is detailed in Table 13-11. This relates to consideration of the Scheme and embedded mitigation (see Section 13.10).

13.9.10. Where necessary, essential mitigation is noted. This is then taken into account in deriving an overall residual effects assessment score.

Operation

13.9.11. The assessment of operational impacts and resultant effects is detailed in Table 13-12.

Table 13-11 – Residual effects of construction activities on Private Property and Housing

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Private property: Three residential properties at Stanboro Lane, adjacent to Sheldon Nurseries 14 residential properties at Withybridge Gardens Two residential properties at Withy ~~b~~B ridge (north side of the A4019, near Withybridge Lane) Three residential properties at Uckington (south of the A4019) Ten residential properties (along the A4019, to the east of the West Cheltenham Fire Station)	Permanent land take and property demolition	Medium High for the three residential properties at Uckington	Major adverse	Large adverse (significant) Permanent, direct, and irreversible
	Summary of effects assessment	The magnitude of impact for the loss of these residential properties would be major adverse. LA 104 allows for the selection of moderate or large adverse for the effects assessment where sensitivity is medium; and large or very large where sensitivity is high (i.e. for the properties at Uckington). In this instance, due to the relatively small number of properties affected across the receptors and taking account of resident views expressed during consultation relating to impacts on their properties, the assessment concludes **a large adverse effect** which is significant. All properties required to be demolished to facilitate the Scheme are either currently under the ownership of the Applicant, or ongoing discussions between the landowner and the Applicant are taking place in relation to this issue. Other matters relating to Compensation are outside the scope of this assessment.		
		Embedded mitigation: Refer to mitigation ref. PHH4 and PHH9 in Table 13-19. Essential mitigation: No specific additional mitigation measures are proposed. Compensation is required for the compulsory purchase.		
	Residual effects assessment (effect + essential mitigation)	The residual effects assessment is **large adverse**, which is significant. Compensation is required for the compulsory purchase.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Private property: >150 residential properties to the north-west of Cheltenham	Temporary disruptions to access via the A4019 due to construction works and traffic management	Very high	Negligible adverse	Slight adverse (not significant) Temporary, indirect, and reversible
	Summary of effects assessment	The Scheme will not alter the characteristics, features or elements of the residential properties and the magnitude of impact for the temporary disruption to the A4019, as one of various access routes to these properties, would be negligible adverse. The impact is temporary and reversible and alternative access routes unaffected by the traffic management for the Scheme are available. The assessment concludes a **slight adverse effect**, which is not significant.		
		Embedded mitigation: Refer to mitigation ref. G1, G2, G3, G4, PHH3, PHH4, PHH5, PHH6, PHH7, PHH10, G10, PHH11, PH16 in Table 13-19. Essential mitigation: No specific additional mitigation measures are proposed.		
	Residual effects assessment (effect + essential mitigation)	As there is no essential mitigation proposed, the residual effects assessment reflects the main assessment and is **slight adverse**, which is not significant.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Private property: - < 30 residential properties at Uckington	Access: temporary disruptions to access via the junction with the A4019 due to construction works and traffic management. Characteristics: change in key settlement characteristics due to the introduction of urbanising elements (Note that the demolition of three properties within this receptor is addressed separately)	High	Access: Moderate adverse Characteristics: Moderate adverse	Access: Moderate adverse (significant) Temporary, indirect, and reversible Characteristics: Moderate adverse (significant) Temporary, direct, and evolving
	Summary of effects assessment	The magnitude of impact for the temporary disruption to the A4019, as a primary access to these properties from the south, will be moderate adverse. The establishment and ongoing progression of the construction activities, including the presence of highways works (including signage, cones, temporary lighting, presence of workers and machinery) for a prolonged period (up to 24 months), as well as demolition of properties adjacent to the A4019, will result in a direct change in the characteristics of the settlement, which will gradually lose its established rural characteristics. The magnitude of impact to these properties will be moderate adverse. LA 104 allows for the selection of moderate or large adverse for the effects assessment. In this instance, due to the temporary and evolving nature of the impacts and the relatively small number of properties affected, the assessment concludes a **moderate adverse effect** for both types of impacts, which is significant.		
		Embedded mitigation: Refer to mitigation ref. G1, G2, G3, G4, PHH3, PHH4, PHH5 PHH6, PHH7, PHH9, PHH10, G10, PH11, G11, PHH16, SD6 and SD7 in Table 13-19.		

	Essential mitigation: Temporary signalised crossing facilities should be provided along key WCH desire lines (including on the A4019 at Uckington) during the construction phase, as part of the temporary construction plan (refer to mitigation ref. PHH5). PLO to liaise with local residents along and with key access via the A4019 (including Uckington) in order to discuss the sequence of construction works and explore/agree the potential merits of temporary measures such as (but not limited to) siting of acoustic barriers and hoardings as part of the establishment and progression of construction works along the A4019 (refer to mitigation ref. PHH16). Removal of minimal extent of vegetation necessary for the works. Detail design to look to further reduce loss (refer to mitigation ref. LV2).
Residual effects assessment (effect + essential mitigation)	The residual effects assessment for the access impacts, taking into account embedded and essential mitigation measures, is reduced to **slight adverse**, which is not significant. The residual effects assessment for the change in Uckington's key characteristics, taking into account embedded and essential mitigation measures, remains **moderate adverse** which is significant.

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Private property: - < 30 residential properties adjacent to the M5 and at Withybridge Lane - <30 residential properties at Stanboro Lane and close to A4019	Temporary disruptions to access via the A4019 due to construction works and traffic management Relocation of bus stops further from properties at Cooks Lane, which is closest provision to these receptors	Medium	Moderate adverse	Moderate adverse (significant) Temporary, indirect, and reversible
	Summary of effects assessment	The magnitude of impact for the disruption to access to these properties would be moderate adverse. Properties will experience a substantial increase in walking distance to the nearest bus stop during the construction phase due to relocation of the existing stop close to Cooks Lane. Properties close to the route of the Link Road will experience disruption from construction activities associated with the establishment of the temporary haul road along the length of the proposed alignment, as well as traffic movements on the existing road network, noting that activity hubs are anticipated at satellite construction offices on the south side of the A4019 near Withybridge Lane and at the southern end of the proposed Link Road. The impacts are temporary and evolving in nature and affect a relatively small number of properties. The assessment concludes a **moderate adverse effect** which is significant.		
		Embedded mitigation: Refer to mitigation ref. G1, G2, G3, G4, PHH3, PHH4, PHH5, PHH6, PHH7, PHH9, PHH10, G10, PH11, G11, PHH16, SD6 and SD7 in Table 13-19. Essential mitigation: PLO to prioritise direct liaison with owners/occupants of residential receptors anticipated to experience direct impacts on access during the construction phase, to ensure that suitable access and egress to their property is available at all times during the construction phase. Relates to Cooks Lane, Homecroft Drive and Appleyard Close (north) (refer to mitigation ref. PH11).		
	Residual effects assessment (effect + essential mitigation)	The residual effects assessment, taking into account embedded and essential mitigation measures, is reduced to **slight adverse**, which is not significant.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Private property: - 76 residential properties between Uckington and Gallagher Retail Park	Access: temporary disruptions to access via the A4019 due to construction works and traffic management Characteristics: change in key settlement characteristics due to the introduction of urbanising elements and demolition of some of the residential properties within the cluster (Note that the demolition impacts on affected owners of ten properties within this receptor is addressed separately)	High	Access: Minor adverse Characteristics: Moderate adverse	Access: slight adverse (not significant) Characteristics: moderate adverse (significant) Temporary (demolition is permanent), direct and evolving
	Summary of effects assessment	The magnitude of impact for the temporary disruption to the A4019, as a primary access to these properties either directly or via Homecroft Drive and Appleyard Close, will be minor adverse. This reflects the embedded mitigation, which will preserve access throughout the construction phase. The establishment and ongoing progression of the construction activities, including the presence of highways works (including signage, cones, temporary lighting, presence of workers and machinery) for a prolonged period (up to 24 months), as well as demolition of properties adjacent to the A4019, will result in a direct change in the characteristics of the setting of these properties, which will lose some of its established rural characteristics. The magnitude of impact to these properties will be moderate adverse,			

		reflecting a worst case scenario as properties further to the south within the cluster are less affected by the impact. LA 104 allows for the selection of slight or moderate adverse for the combination of sensitivity and magnitude for the access impacts. In this instance, due to the temporary and evolving nature of the impacts, the relatively small number of properties affected and the intended evolution of access to benefit the residents as part of the Scheme, the assessment concludes a **slight adverse effect** for the access impacts, which is not significant. LA104 allows for the selection of moderate or large adverse for the combination of sensitivity and magnitude for the impacts on characteristics. In this instance, due to the relatively limited scale of the impacts, which will be most notable for the northern residents of this cluster where there is a boundary with the A4019 or sightlines to the junctions, the assessment concludes a **moderate adverse effect**, which is significant**.**
		Embedded mitigation: Refer to mitigation ref. G1, G2, G3, G4, PHH3, PHH4, PHH5, PHH6, PHH7, PHH9, PHH10, G10, PH11, G11, PHH16, SD1 and SD7 in Table 13-19. **Essential mitigation**: PLO to prioritise direct liaison with owners/occupants of residential receptors anticipated to experience direct impacts on access during the construction phase, to ensure that suitable access and egress to their property is available at all times during the construction phase. Relates to Cooks Lane, Homecroft Drive and Appleyard Close (north) (refer to mitigation ref. PH11). PLO to liaise with local residents along and with key access via the A4019 (including Uckington) in order to discuss the sequence of construction works and explore/agree the potential merits of temporary measures such as (but not limited to) siting of acoustic barriers and hoardings as part of the establishment and progression of construction works along the A4019 (refer to mitigation ref. PHH16).

		Removal of minimal extent of vegetation necessary for the works. Detail design to look to further reduce loss (refer to mitigation ref. LV2).
	Residual effects assessment (effect + essential mitigation)	No essential mitigation has been identified for the access impacts; thus, the residual effects assessment is unchanged from the main assessment and concludes **slight adverse effects**, which are not significant. The residual effects assessment for the impacts on characteristics, taking into account embedded and essential mitigation measures, is reduced to **slight adverse**, which is not significant.

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Private property: Sheldon Cottages (two semi-detached houses) at Stanboro Lane and close to A4019 and M5 Junction 10	Access: temporary disruptions to access via the A4019 due to construction works and traffic management, use of access routes by construction traffic and construction of new road alignment. Characteristics: change in key characteristics due to road realignment, demolition of adjacent properties, introduction of new earth banks and siting of construction compounds adjacent.	Medium	Access: major adverse Characteristics: major adverse (change in characteristics)	Large adverse (significant) Temporary, indirect, and reversible Large adverse (significant) Temporary, direct, and evolving
	Summary of effects assessment	The magnitude of impact for the temporary disruption to the A4019, as a primary access to these properties via Stanboro Lane, will be major adverse. This reflects the embedded mitigation, which will preserve access throughout the construction phase. The establishment and ongoing progression of the construction activities, including the presence of highways works (including signage, cones, temporary lighting, presence of workers and machinery) for a prolonged period (up to 24 months), as well as the introduction of new earth banks and siting of construction compounds adjacent to the properties, will result in a direct change in the characteristics of the setting of these properties, which will lose some of its established rural characteristics. The magnitude of impact to these properties will be major adverse.			

	Embedded mitigation: Refer to mitigation ref. PHH3, PHH4, PHH5, G1, PHH6, PHH9, PH11, SD7 in Table 13-19. Essential mitigation: Protection of retained vegetation (trees and hedges) in accordance with the Arboricultural Impact Assessment (AIA) to avoid detrimental damage during construction (refer to mitigation ref. LV1). Any retained vegetation will be clearly demarcated with no allowance of vehicles or storage of materials within these areas. The root zones and canopies of trees and areas of woodland to be retained will be protected during construction. Protection of retained vegetation (trees and hedges) in accordance with the AIA to avoid detrimental damage (refer to mitigation ref. B6). PLO to prioritise direct liaison with owners/occupants of Sheldon Cottages to relocate residents during the construction phase to address effects of reduced amenity and disruption (refer to mitigation ref. G12).
Residual effects assessment (effect + essential mitigation)	The residual effects assessment for the access impacts, taking into account embedded and essential mitigation measures (which include relocation of residents during construction), is reduced to **slight adverse**, which is not significant. The residual effects assessment for the change in Sheldon Cottages key characteristics, taking into account embedded and essential mitigation measures, is reduced to **moderate adverse,** which is significant.

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Private property: < 30 caravans sited within an informal Traveller site, adjacent to the M5, north of Junction 10	Land take: partial land take at western edge of site, adjacent to motorway Vegetation clearance: removal of screening vegetation visually enclosing and providing acoustic screening from the motorway corridor Access: loss of vehicular access to the A4019 and temporary disruptions to access via the A4019 due to construction works and traffic management	Medium	Land take: moderate adverse Vegetation clearance: moderate adverse Access: major adverse	Land take: moderate adverse (significant) Vegetation clearance: moderate adverse (significant) Access: large adverse (significant) Temporary, direct and a combination of reversible (access) and irreversible (land take and vegetation clearance)
	Summary of effects assessment	The partial land take and vegetation loss affect part of the western edge of the site and the existing access route between the site and the A4019, around the edge of intervening farmland and will damage the screening of the site from the motorway corridor, representing a moderate adverse magnitude of impact on established key characteristics. The land take relating to the site itself is permanent but does not affect areas that appear to be in active use. The vehicular access route to the site will be removed resulting in a major adverse magnitude of impact. These impacts on access are temporary during construction and reversible. There is also potential availability of alternative access routes across the intervening field during the period of temporary disruption, albeit that these are not envisaged to be formalised within the Scheme.			
		Embedded mitigation: Refer to mitigation ref. PHH3, PHH4, PHH5 G1, G2, G3, G4, PHH6, PHH7, PHH8, PHH9, PHH10, G10, PH11, G11, PHH16, SD6 and SD7 in Table 13-19. Essential mitigation: Contractor to maintain access to the informal Traveller site (adjacent to the M5) through fields to the north of the A4019 for the duration of the construction phase. The timing of the creation of this access will ensure that			

	access is maintained to the informal Traveller site during construction of the Scheme (mitigation ref. PHH8 detailed in Table 13-19).
Residual effects assessment (effect + essential mitigation)	The residual effects assessment for the land take impacts alone, taking into account embedded and essential mitigation measures (which include reprovision of access that will be lost to land take), is reduced to **slight adverse**, which is not significant. The residual effects assessment has considered that various impacts on key characteristics. These comprise the land take impact and the~~for the~~ vegetation clearance. ~~impacts on the key characteristics,~~ T~~t~~aking into account embedded and essential mitigation measures, the residual effect of the Scheme on key characteristics~~remains~~ is **moderate adverse**, which is significant. The residual effects assessment for the access impacts, taking into account embedded and essential mitigation measures (which include reprovision of access via an alternative route), is reduced to **slight adverse**, which is not significant.

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Private property: - < 30 properties at Boddington - < 30 properties on the B4634 - < 30 to the west of Elmstone Hardwicke - Voyage Care Orchard Leigh assisted living	Temporary disruptions to access to the A4019 due to construction works and traffic management	Medium	Minor adverse	Slight adverse (not significant) Temporary, direct and a combination of reversible and evolving
	Summary of effects assessment	These receptors may experience temporary disruptions to access as a consequence of construction works on the A4019 and associated traffic management arrangements, which will also affect access routes to the A4019 during the construction phase. The Link Road will be connected to the B4634 as part of the Scheme and construction works associated with this junction may also affect access to these receptors. The magnitude of impact would be minor adverse. The assessment concludes a **slight adverse** effect, which is not significant. This effect is temporary, indirect and reversible/evolving.		
		Embedded mitigation: Refer to mitigation ref. G1, G2, G3, G4, PHH3, PHH4, PHH5, PHH6, PHH7, PHH9, PHH10, G10, PH11, G11, PHH16 SD6 and SD7 in Table 13-19. **Essential mitigation**: No specific additional mitigation measures are proposed.		
	Residual effects assessment (effect + essential mitigation)	No essential mitigation has been proposed. The residual effects assessment remains unchanged from the main assessment and is **slight adverse**, which is not significant.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Private property: - Planning application 22/02172/FUL: erection of four residential properties (on the B4634) - Planning application: 22/00466/FUL erection of four residential properties (Pigeon House Farm) - Planning application 22/01377/FUL: erection of up to 9 residential properties (Manor Farm)	Temporary disruptions to access to the A4019 due to construction works and traffic management	Low	Minor adverse	Slight adverse (not significant) Temporary, direct and a combination of reversible and evolving
	Summary of effects assessment	Proposed development ref. 22/02172/FUL is noted in the CEA assumptions, which have been made for the purposes of the assessment, as having a construction overlap in terms of enabling works. This leads to the assumption that the receptor will be present before conclusion of Scheme construction (4 residential properties). The population assessment is made on the same basis (with further information included in the CEA). Proposed development ref. 22/00466/FUL is noted in the CEA assumptions, as the receptor will be present prior to the commencement of the Scheme's construction works (4 residential properties). Proposed development ref. 22/01377/FUL is noted in the CEA assumptions, as having a construction overlap in the terms of enabling works. This leads to the assumption that the receptor will be present before conclusion of Scheme construction (5 residential properties), however, application is not yet approved. These receptors may experience temporary disruptions to access, both for construction plant and machinery and incoming residents, as a consequence of construction works on the A4019 and associated traffic management arrangements, which will also affect access routes to the A4019 during the construction phase. The Link Road will be connected to the B4634 as part of the Scheme and construction works associated with this junction may also affect access to these receptors, planning application 22/02172/FUL specifically. The magnitude of impact would be minor adverse, reflecting that the developers will be generating their proposals for construction in cognisance of the Scheme and a level of coordination is expected; and the incoming residents will be taking occupation in knowledge of the ongoing construction activities. The assessment concludes a **slight adverse** effect, which is not significant. This effect is temporary, indirect and reversible/evolving.		
		Embedded mitigation: Refer to mitigation ref. G1, G2, G3, G4, PHH3, PHH4, PHH5, PHH6, PHH7, PHH9, PHH10, G10, PH11, G11, PHH16 SD6 and SD7 Table 13-19. **Essential mitigation**:		

	PC will be required to submit all phasing plans associated with the traffic management plan to the GCC streetworks manager on a rolling monthly basis. This will ensure co-ordinated consideration of all streetworks intervention information across projects, capturing all booking system requests for diversions on the GCC highway network; and works will not be implemented until approval and endorsement by GCC is attained. PC may be required to adapt proposals and scheduling in response to streetworks manager requests. The PLO will be required to coordinate dissemination of accurate network disruption information in advance, in accordance with the Communication Engagement Plan (refer to mitigation ref. CEA1).
Residual effects assessment (effect + essential mitigation)	The residual effects assessment for the access impacts, taking into account embedded and essential mitigation measures (which include commitments that have emerged from Chapter 15 - Cumulative Effects Assessment (application document TR010063/APP/6.13), is reduced but remains **slight adverse.** This is a precautionary assessment – if the essential mitigation is successful then the magnitude of impacts may be reduced, but there is uncertainty here relating to the involvement of third party developers.

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Private property: Wentworth Court residential care home Knightsbridge Lodge	Temporary disruptions to access to the A4019 due to construction works and traffic management	High	Minor adverse	Slight adverse (not significant) Temporary, indirect, and reversible
	Summary of effects assessment	This receptor may experience temporary disruptions to access as a consequence of construction works on the A4019 and associated traffic management arrangements, which will also affect access routes to the A4019 during the construction phase. The Link Road will be connected to the B4634 as part of the Scheme and construction works associated with this junction may also affect access to this receptor. The magnitude of impact would be minor adverse. DMRB LA 104 allows for the selection of slight or moderate adverse effects based on this combination of sensitivity and impact magnitude. In this instance, the residents themselves are unlikely to be regular independent road users and visitors will have opportunities to use additional access routes or could use the A4019 under traffic management. The assessment concludes a **slight adverse** effect, which is not significant. This effect is temporary, indirect and reversible/evolving.		
		Embedded mitigation: Refer to mitigation ref. G1, G2, G3, G4, PHH3, PHH4, PHH5, PHH6, PHH7, PHH9, PHH10, G10, PH11, G11, PHH16 SD6 and SD7 in Table 13-19. Essential mitigation: No specific additional mitigation measures are proposed.		
	Residual effects assessment (effect + essential mitigation)	No essential mitigation has been proposed. The residual effects assessment remains unchanged from the main assessment and is **slight adverse**, which is not significant.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Private property - Planning application: 23/00328/OUT erection of 46 affordable residential properties (Knightsbridge Nurseries) - Planning application 22/01163/FUL: erection of 16 residential properties(Uckington Farm) - 21/00872/REM erection for up to 85 residential properties (Phase 1 land, Old Gloucester Road)	Temporary disruptions to access to the A4019 due to construction works and traffic management	High	Minor adverse	Slight adverse (not significant) Temporary, indirect, and evolving
	Summary of effects assessment	Proposed development ref. 23/00328/OUT is noted in the CEA assumptions, which have been made for the purposes of the assessment, as having a construction overlap in terms of enabling works. This leads to the assumption that the receptor will be present before conclusion of Scheme construction (46 homes), however, application is not yet approved. The population assessment is made on the same basis (with further information included in the CEA). Proposed development ref. 22/01163/FUL is noted in the CEA assumptions, as having a construction overlap in terms of enabling works. This leads to the assumption that the receptor will be present before conclusion of Scheme construction (16 homes), however, application is not yet approved. Proposed development ref. 21/00872/REM is noted in the CEA assumptions, which have been made for the purposes of the assessment, as having a construction overlap in terms of enabling works of the south western part of the allocated site. This leads to the assumption that up to 50% of homes may be completed during Scheme construction (43 homes). These receptors may experience temporary disruptions to access, both for construction plant and machinery and incoming residents, as a consequence of construction works on the A4019 and associated traffic management arrangements, which will also affect access routes to the A4019 during the construction phase. The Link Road will be connected to the B4634 as part of the Scheme and construction works associated with this junction may also affect access to these receptors, 21/00872/REM specifically. The magnitude of impact would be minor adverse, reflecting that access will be maintained through the construction phase via the embedded mitigation. DMRB LA 104 allows for the selection of slight or moderate adverse effects based on this combination of sensitivity and impact magnitude. In this instance, the developers will be generating their proposals for construction in cognisance of the Scheme and a level of coordination is expected; and the incoming residents will be taking occupation in knowledge of the ongoing construction activities. The assessment therefore concludes a **slight adverse** effect, which is not significant. This effect is temporary, indirect and reversible/evolving.		

	Embedded mitigation: Refer to mitigation ref. G1, G2, G3, G4, PHH3, PHH4, PHH5, PHH6, PHH7, PHH9, PHH10, G10, PH11, G11, PHH16 SD6 and SD7 in Table 13-19. **Essential mitigation**: PC will be required to submit all phasing plans associated with the traffic management plan to the GCC streetworks manager on a rolling monthly basis. This will ensure co-ordinated consideration of all streetworks intervention information across projects, capturing all booking system requests for diversions on the GCC highway network; and works will not be implemented until approval and endorsement by GCC is attained. PC may be required to adapt proposals and scheduling in response to streetworks manager requests. The PLO will be required to coordinate dissemination of accurate network disruption information in advance, in accordance with the Communication Engagement Plan (refer to mitigation ref. CEA1).
Residual effects assessment (effect + essential mitigation)	The residual effects assessment for the access impacts, taking into account embedded and essential mitigation measures (which include commitments that have emerged from Chapter 15 - Cumulative Effects Assessment (application document TR010063/APP/6.13), is reduced but remains **slight adverse.** This is a precautionary assessment – if the essential mitigation is successful then the magnitude of impacts may be reduced, but there is uncertainty here relating to the involvement of third party developers.

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Private property - Planning application 20/00759/FUL: erection of 266 residential properties at Swindon Farm (relates to Policy A4, North West Cheltenham Development Area) - Planning application 23/00354/OUT erection of up to 180 units at Home Farm (relates to Policy A4, North West Cheltenham Development Area) - Planning application 21/02832/OUT: erection of up to 215 residential properties(relates to Policy H2	Temporary disruptions to access due to construction works and traffic management affecting the A4019 and wider route network.	Very high	Minor adverse (203/00759/FUL and 23/00354/OUT) Negligible adverse (21/02832/OUT)	Moderate adverse (significant) (203/00759/FUL and 23/00354/OUT) Slight adverse (not significant) (21/02832/OUT) Temporary, indirect, and evolving
	Summary of effects assessment	Proposed development ref. 20/00759/FUL is noted in the CEA assumptions, which have been made for the purposes of the assessment, as having a construction overlap in terms of enabling works and several phases of development. This leads to the assumption that up to 25% of homes may be occupied at commencement of Scheme construction (c.66 homes), rising to 75% (c.200 homes) by the end of Scheme construction. The population assessment is made on the same basis (with further information included in the CEA). Proposed development ref. 23/00354/OUT is noted in the CEA assumptions, which have been made for the purposes of the assessment, as having a construction overlap in terms of enabling works. It is assumed that up to 25% of homes will be present before the conclusion of Scheme construction (up to 45 homes). Proposed development ref: 21/02832/OUT is noted in the CEA assumptions, which have been made for the purposes of the assessment, as having construction overlap in terms of enabling works. It is assumed that up to 25% of homes will be present before the conclusion of Scheme construction (up to 54 homes). These receptors may experience temporary disruptions to access, both for construction plant and machinery and incoming residents, as a consequence of construction works on the A4019 and associated traffic management arrangements, which will also affect access routes to the A4019 during the construction phase. The magnitude of impact for the receptors closest to the A4019 would be minor adverse; and negligible adverse for the receptor to the east of the Scheme. These impact magnitudes reflect that access will be maintained through the construction phase via the embedded mitigation; and that to the east of the Scheme there are alternative access routes. For the combination of sensitivity and impact magnitude for 203/00759/FUL and 23/00354/OUT, DMRB LA 104 allows for the selection of large or moderate adverse effects. In this instance, the developers will be generating their proposals for construction in cognisance of the Scheme and a level of coordination is expected; and the incoming residents will be taking occupation in knowledge of the ongoing construction activities. The assessment therefore concludes a **moderate adverse effect** which is **significant.** This effect is temporary, indirect, and evolving.			

Lansdown industrial estate, Cheltenham Local Plan)		For the combination of sensitivity and impact magnitude for 21/02832/OUT, the resultant effect is **slight adverse**, which is **not significant.** This effect is temporary, indirect and evolving.
		Embedded mitigation: Refer to mitigation ref. G1, G2, G3, G4, PHH3, PHH4, PHH5, PHH6, PHH7, PHH9, PHH10, G10, PH11, G11, PHH16 SD6 and SD7 in Table 13-19. **Essential mitigation**: PC will be required to submit all phasing plans associated with the traffic management plan to the GCC streetworks manager on a rolling monthly basis. This will ensure co-ordinated consideration of all streetworks intervention information across projects, capturing all booking system requests for diversions on the GCC highway network; and works will not be implemented until approval and endorsement by GCC is attained. PC may be required to adapt proposals and scheduling in response to streetworks manager requests. The PLO will be required to coordinate dissemination of accurate network disruption information in advance, in accordance with the Communication Engagement Plan (refer to mitigation ref. CEA1). GCC is committed to seeking to establish the right level of discussion, meeting, planning, coordination of programmes and engagement with the public and other stakeholders between GCC officers, the Scheme PC and relevant developers of the safeguarded land to the north-west of Cheltenham and the North West Cheltenham Development Area. The aim of these endeavours by GCC will be to ensure that proposals for change at these locations complement the intentions of the Scheme, particularly in relation to securing functional ecosystems that continue to support the protected species known to be present in the study area; building on the landscape structure; maintaining connectivity for WCH routes; as well as engaging meaningfully with local communities and stakeholders to support people in adapting to transformational change (refer to mitigation ref. CEA2).
	Residual effects assessment (effect + essential mitigation)	The residual effects assessment for the access impacts on 20/00759/FUL and 23/00354/OUT, taking into account embedded and essential mitigation measures (which include commitments that have emerged from Chapter 15 - Cumulative Effects Assessment (application document TR010063/APP/6.13)), is reduced but remains **moderate adverse**, which is significant. This is a precautionary assessment – if the essential mitigation is successful then the magnitude of impacts may be reduced, but there is uncertainty here relating to the involvement of third party developers. The residual effects assessment for access impacts on 21/02832/OUT is **slight adverse**, which is not significant.

Table 13-12 – Residual effects of operation on Private Property and Housing

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Properties close to the proposed Link Road: - properties adjacent to the B4634; - properties adjacent to M5 and Withybridge Lane	Loss of rural characteristics due to introduction of Link Road through agricultural land	Medium	Minor adverse	Slight adverse (not significant) Temporary, indirect and evolving as landscaping matures
	Summary of effects assessment	The Scheme (see General Arrangements Plans (application document TR010063/APP/2.9)) will result in a minor loss of key characteristics relating to the rural outlook over agricultural fields extending east from the M5 corridor. This is due to their proximity to the proposed West Cheltenham Link Road – this will create a new route for traffic that will be close to the properties. This is considered to result in a minor adverse magnitude of impact, reflecting that the wider context includes the M5 corridor and Withybridge Lane, as well as the landscaping proposed within the Scheme (Environmental masterplan (application document TR010063/APP/2.13)), which follows a series of principles including retaining natural character through planting local native species, supplemented along the Link Road with blocks of trees/woodland, particularly around the River Chelt bridge and to provide some screening for visual receptors. The resultant effect is therefore assessed as **slight adverse and not significant**.		
		Embedded mitigation: Refer to mitigation ref. B7, LV3, LV6, LV8, PHH7 in Table 13-19. **Essential mitigation:** No specific additional mitigation measures are proposed.		
	Residual effects assessment (effect + essential mitigation)	No essential mitigation has been proposed. The residual effects assessment remains unchanged from the main assessment and is **slight adverse**, which is not significant.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
- Land allocated under Policies A4, A7, (North West Cheltenham Development Area, West Cheltenham Development Area) - Safeguarded land under Policy SD5 (Safeguarded land to the north-west of Cheltenham) - Planning application 16/02000 /OUT (relates to Policy A4, North West Cheltenham Development Area) - Planning application 23/00354/OUT erection of up to 180 residential properties (relates to Policy A4, North West Cheltenham Development Area) - Planning application 20/00759/FUL: erection of 266 residential properties (relates to Policy A4, North West Cheltenham Development Area) - Planning application 22/01817/OUT22/01107/OUT: erection of residential properties (relates to Policy A7, West Cheltenham Development Area) - >150 residential properties in north-west Cheltenham	Access improvements, some of which provide direct access to development sites Strategic access improvements across a range of modes	Very high	Moderate beneficial	Large beneficial (significant)
	Summary of effects assessment	For the strategic development sites (North West Cheltenham Development Area; West Cheltenham Development Area and safeguarded land to the north-west of Cheltenham), the Scheme (see General Arrangements Plans (application document TR010063/APP/2.9)) will deliver access into the land parcels. This will deliver transport improvements that are a policy requirement in the JCS to catalyse their development. This will deliver a moderate magnitude of impact in terms of enabling residential development. DMRB LA104 allows for the identification of large or very large effects based on this combination of sensitivity and impact magnitude. On the basis that the Scheme is a catalyst providing primary access points and multi-modal access, but that subsequent proposals will be required to realise the full connectivity into and across these sites, the resultant effect is assessed as **large beneficial and significant**. For north-west Cheltenham residents and prospective residents at the site allocated under Cheltenham Local Plan policy HD8, the operational impacts of the Scheme will be realised as improved access – these relate to the increased capacity of the road network, reduced congestion, and increased journey time reliability, coupled with enhanced walking and cycling access and movement through the study area and between these receptors and other key destinations accessed via the A4019. This is assessed as a moderate magnitude of impact. DMRB LA104 allows for the identification of large or very large effects based on this combination of sensitivity and impact magnitude – on the basis that the developer proposals would be required to realise the full connectivity potential of the site, the resultant effect is assessed as **large beneficial and significant.**		
		Embedded mitigation: Refer to mitigation ref. SD2, SD3 and SD5 in Table 13-19. **Essential mitigation:**		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
		No specific additional mitigation measures are proposed.		
	Residual effects assessment (effect + essential mitigation)	No essential mitigation has been proposed. The residual effects assessment remains unchanged from the main assessment and is **large beneficial**, which is significant.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
- Planning application 21/00872/REM (phase 1 land at Old Gloucester Road) erection of 85 residential properties (relates to land allocated under Policy HD8)	Access improvements, to facilitate development Strategic access improvements across a range of modes	High	Moderate beneficial	Moderate beneficial (significant)
	Summary of effects assessment	For prospective residents of the development proposed on part of the site allocated under Cheltenham Local Plan policy HD8, the operational impacts of the Scheme will be realised as improved access – these relate to the increased capacity of the road network, reduced congestion, and increased journey time reliability, coupled with enhanced walking and cycling access and movement through the study area and between this receptor and other key destinations accessed via the A4019. This is assessed as a moderate magnitude of impact. DMRB LA104 allows for the identification of moderate or large effects based on this combination of sensitivity and impact magnitude – on the basis that the developer proposals would be required to realise the full connectivity potential of the site, the resultant effect is assessed as **moderate beneficial and significant.**		
		Embedded mitigation: Refer to mitigation ref. SD2, SD3 and SD5 in Table 13-19. **Essential mitigation:** No specific additional mitigation measures are proposed.		
	Residual effects assessment (effect + essential mitigation)	No essential mitigation has been proposed. The residual effects assessment remains unchanged from the main assessment and is **moderate beneficial**, which is significant.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
- Planning application 21/02832/OUT (Lansdown Industrial Estate) erection of up to 215 residential properties	Access improvements, to facilitate development Strategic access improvements across a range of modes	Very High	Minor beneficial	Moderate beneficial (significant)
	Summary of effects assessment	For prospective residents of the residential development proposed under this application, covering part of the larger site allocated under Cheltenham Local Plan Policy H2 for mixed development, the operational impacts of the Scheme will be realised as improved access – these relate to the increased capacity of the road network, reduced congestion, and increased journey time reliability. DMRB LA104 allows for the selection of moderate or large beneficial effects for this combination of sensitivity and impact magnitude. Recognising that the proposed development site is not yet implemented, and the Scheme is not considered fundamental to its implementation given its distance from the Scheme, the assessment concludes **moderate beneficial effects**, which are significant.		
		Embedded mitigation: Refer to mitigation ref. SD2, SD3 and SD5 in Table 13-19. **Essential mitigation:** No specific additional mitigation measures are proposed.		
	Residual effects assessment (effect + essential mitigation)	No essential mitigation has been proposed. The residual effects assessment remains unchanged from the main assessment and is **moderate beneficial**, which is significant.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
- 30 caravans sited within an informal Traveller site, adjacent to the M5, north of Junction 10 - < 30 properties at Boddington - Properties to the west of Elmstone Hardwicke - Residential properties at Stanboro Lane and adjacent to the A4019 at M5 Junction 10 - Voyage Care, Orchard Leigh	Strategic access improvements across a range of modes	Medium	Moderate beneficial	Moderate beneficial (significant)
	Summary of effects assessment	Access for these receptors will be improved through the implementation of the Scheme (see General Arrangements Plans (application document TR010063/APP/2.9)). In general terms, improvements relate to the increased capacity of the road network, reduced congestion, and increased journey time reliability, coupled with enhancement to WCH access and movement through the study area and between these receptors. Public transport accessibility will benefit from improved traffic flow and renewal of bus stop infrastructure. The existing access point from the A4019 into the informal Traveller site will be relocated further east of its current location. Properties to the south of the A4019 (e.g. at Cooks Lane) will benefit from access routes parallel to the A4019 connecting to signalised junctions onto the A4019, which will improve journey time reliability and safety of crossing movements for motorists accessing/egressing these properties via the A4019. Taken together, these aspects of the Scheme will deliver a moderate magnitude of impact. The resultant effect on these receptors would therefore be **moderate beneficial**.		
		Embedded mitigation: Refer to mitigation ref. PHH8, PHH17, SD1, SD2 and SD3 in Table 13-19. **Essential mitigation:** No specific additional mitigation measures are proposed.		
	Residual effects assessment (effect + essential mitigation)	No essential mitigation has been proposed. The residual effects assessment remains unchanged from the main assessment and is **moderate beneficial**, which is significant.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
- < 30 residential properties at Uckington	Access: Strategic access improvements across a range of modes Key characteristics: Change in key rural characteristics due to property demolition and introduction of urbanising features to A4019 corridor and junctions	High	Access: moderate beneficial Key characteristics: minor adverse	Access: moderate beneficial (significant) Key characteristics: moderate adverse (significant)
	Summary of effects assessment	Access for these receptors will be improved through the implementation of The Scheme (see General Arrangements Plans (application document TR010063/APP/2.9)). In general terms, improvements relate to the increased capacity of the road network, reduced congestion, and increased journey time reliability, coupled with enhancement to WCH access and movement through the study area and between these receptors and other destinations. The junction providing access to the A4019 from Uckington will be signalised and some residents north and south of the A4019 will benefit from parallel access routes connecting to the signalised junction, which will improve journey time reliability and safety of crossing movements for motorists. Walking and cycling connectivity will also be enhanced with access to the continuous shared use path alongside the northern carriageway of the A4019, which includes crossing phases within major junctions. Taken together, these aspects of the Scheme will deliver a moderate beneficial magnitude of impact for access. DMRB LA104 allows for the selection of moderate or large beneficial effects for this combination of sensitivity and impact magnitude. In this instance, due to the relatively small number of properties at the cluster and the proximity to the existing strategic road network, the resultant effect is assessed as **moderate beneficial, which is significant**. The design of the reconfigured junction of Green Lane and Moat Lane with the A4019 at Uckington will result in a discernible change in the characteristics of the approach into and route through the settlement. The current junction forms an offset cross-roads between the A4019 and two routes with the appearance of rural side roads. The proposed junction would require demolition of properties and expansion of the highway boundary to the south to realign these		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
		routes to form a cross-roads and is much larger than at present, with the addition of traffic lights on all approaches, additional lanes for queueing and access/service roads alongside the A4019. The overall appearance is therefore likely to engender a more urban character and become associated with queuing traffic, due to the signals. This effect relates to one of the characteristics and affects part of the settlement – it is considered to be a minor adverse magnitude of impact. DMRB LA104 allows for the selection of slight or moderate adverse effects for this combination of sensitivity and impact magnitude. In this instance, in consideration of the proportion of the settlement that will experience direct changes and changes to outlook, the resultant effect is assessed as a **moderate adverse effect, which is significant**, although it is noted that this may become slight over time as the landscaping matures**.**		
		Embedded mitigation: Refer to mitigation ref. PHH7, PHH17, PH18, SD1, SD2 and SD3 in Table 13-19. **Essential mitigation:** Scheme design (see General Arrangements Plans (application document TR010063/APP/2.9)) incorporates specific elements of access improvements for properties to the north and south of the A4019 at Uckington. Walking and cycling access to the Shared Use Path and phased crossing provision at junctions is included (refer to mitigation SD4). Detailed design should ensure the retention of the dark corridors between Uckington and Cheltenham, to preserve the distinct boundaries around Uckington and the designated heritage assets at Moat House. Traffic signals at the realigned A4019/ Moat Lane junction should not be directly visible from the Bridge and Attached Pair of Lodges, Moat House (NHLE 1154528) (refer to mitigation ref. CH2). Replacement of woodland, scrub, hedges, trees and grass land and new suitable planting to new features, including wetland areas, link road and central reserves, to integrate Scheme into the landscape, reinstate screening effect and replace lost habitats wherever possible. Evergreen native/non-invasive species to be included where screening is a function (refer to mitigation ref. LV3).		
	Residual effects assessment (effect + essential mitigation)	No essential mitigation has been proposed for access. The residual effects assessment remains unchanged from the main assessment and is **moderate beneficial**, which is significant. The residual effects assessment for the impacts on the rural characteristics of the settlement, taking into account embedded and essential mitigation measures (which include targeted preservation of dark corridors and proposals for planting), is reduced but remains **moderate adverse**, which is significant. This is a precautionary assessment –the essential mitigation has the potential to reduce the magnitude of impacts over time as landscaping matures.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
- 76 residential properties between Uckington and Gallagher Retail Park	Access: strategic access improvements across a range of modes Key characteristics: change in rural characteristics due to property demolition and introduction of urbanising features to A4019 corridor and junctions	High	Access: moderate beneficial Key characteristics: minor adverse	Access: large beneficial (significant) Key characteristics: slight adverse (not significant)
	Summary of effects assessment	Access for these receptors will be improved through the implementation of the Scheme (see General Arrangements Plans (application document TR010063/APP/2.9)). In general terms, improvements relate to the increased capacity of the road network, reduced congestion, and increased journey time reliability, coupled with enhancement to WCH access and movement through the study area and between these receptors. Public transport accessibility will benefit from improved traffic flow, renewal of bus stop infrastructure and introduction of a bus lane. Properties to the south of the A4019 (e.g. at Homecroft Drive and the northern end of Appleyard Close) will benefit from access routes parallel to the A4019 connecting to signalised junctions onto the A4019, which will improve journey time reliability and safety of crossing movements for motorists accessing/egressing these properties via the A4019. This was raised as desirable by residents through consultation. Taken together, these aspects of the Scheme will deliver a moderate beneficial magnitude of impact for access. DMRB LA104 allows for the selection of moderate or large beneficial effects for this combination of sensitivity and impact magnitude. In this instance, due to the relatively large number of properties involved and the views of occupants expressed through consultation, the resultant effect on access to these receptors would therefore be **large beneficial**, which is significant.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
		The implementation of the Scheme (see General Arrangements Plans (application document TR010063/APP/2.9)) includes landscaping intended to soften the amended A4019 corridor into the wider landscape over time. Notwithstanding this, the outlook from properties in the northern part of this cluster will discernibly alter. The magnitude of this impact is minor adverse. DMRB LA104 allows for the selection of slight or moderate adverse effects for this combination of sensitivity and impact magnitude. In this instance, due to the relatively small proportion of the receptor affected by the impacts and coupled with the evolving nature of the impact (in that it will lessen as landscaping matures), the resultant effect on these receptors in terms of changes to rural characteristics is **slight adverse** and not significant.		
		Embedded mitigation: Refer to mitigation ref. PHH8, PHH17, SD1, SD2 and SD3 in Table 13-19. **Essential mitigation:** No specific additional mitigation measures are proposed.		
	Residual effects assessment (effect + essential mitigation)	No essential mitigation has been proposed. The residual effects assessment remains unchanged from the main assessment for access effects and is **large beneficial**, which is significant. The residual effects assessment remains unchanged from the main assessment for key characteristics effects and is **slight adverse**, which is not significant.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Private property: Sheldon Cottages (two semi-detached houses) at Stanboro Lane and close to A4019 and M5 Junction 10	Access: strategic access improvements across a range of modes Key characteristics: change in characteristics due to demolition and new earth banks and local access road changes	Medium	Access: moderate beneficial Key characteristics: minor adverse	Access: moderate beneficial (significant) Key characteristics: slight adverse (not significant)
	Summary of effects assessment	Access for these receptors will be improved through the implementation of the Scheme (see General Arrangements Plans (application document TR010063/APP/2.9)). In general terms, improvements relate to the increased capacity of the road network, reduced congestion, and increased journey time reliability, coupled with enhancement to walking and cycling access and movement through the study area and between these receptors and other destinations. The resultant effect is likely to be **moderate beneficial, which is significant**. The design of M5 Junction 10 will increase the capacity of the Junction and expansion of the highway boundary, also necessitating demolition of properties adjacent to the Sheldon Cottages. The Junction will be much larger than at present therefore the appearance is likely to engender a more urban character, albeit that this will be raised on embankment and not within the direct views from the receptors. The retention of vegetation and gardens around Sheldon Cottages (classified as 'retained vegetation') will soften the appearance of urban features within the overall changed character. This resultant effect is likely to be **minor adverse**, which is not significant.			
		Embedded mitigation: Refer to mitigation ref. PHH7, PH18, PHH17, SD1, SD3 and LV3 in Table 13-19 **Essential mitigation:** Replacement of woodland, scrub, hedges, trees and grass land and new suitable planting to new features, including wetland areas, link road and central reserves, to integrate Scheme into the landscape, reinstate screening effect and replace lost habitats wherever possible. Evergreen native/non-invasive species to be included where screening is a		

	function (refer to mitigation ref. LV3). Consider early planting where this is identified for visual mitigation requirements where feasible within programme to allow planting to establish and the integration of the Scheme into the surrounding landscape sooner (refer to mitigation ref. LV8).
Residual effects assessment (effect + essential mitigation)	No essential mitigation has been proposed for access. The residual effects assessment remains unchanged from the main assessment for access effects and is **moderate beneficial**, which is significant. The residual effects assessment for the change in Sheldon Cottages key characteristics, taking into account embedded and essential mitigation measures, is **slight adverse** which is not significant.

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
- Planning application 22/01163/FUL Uckington Farm erection of 16 residential properties - Planning application 23/00328/OUT Knightsbridge Nurseries: erection of up to 46 residential properties	Strategic access improvements across a range of modes	High	Minor	Slight beneficial (not significant)
	Summary of effects assessment	Access for these receptors will be improved through the implementation of the Scheme (see General Arrangements Plans (application document TR010063/APP/2.9)). In general terms, improvements relate to the increased capacity of the road network, reduced congestion, and increased journey time reliability, coupled with improvements to bus infrastructure and enhancement to walking and cycling access and movement through the study area and between these receptors and other destinations. This is considered to result in a minor beneficial impact as the properties are not yet implemented and the Scheme is not considered to be fundamental to its implementation. DMRB LA104 allows for the resultant effect to be assessed as slight or moderate due to this combination of sensitivity and magnitude of impact. Due to the Scheme increasing capacity on the road network which will benefit the proposed properties, the resultant effect is likely to be **slight beneficial which is not significant**.		
		Embedded mitigation: None proposed. **Essential mitigation:** No specific additional mitigation measures are proposed.		
	Residual effects assessment (effect + essential mitigation)	No essential mitigation has been proposed for access. The residual effects assessment remains unchanged from the main assessment for access effects and is **slight beneficial**, which is not significant.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
- Planning application 22/01272/FUL Pigeon House Farm: erection of four residential properties - Planning application 22/02172/FUL Pilgrove Cottage: erection of four residential properties - Planning application 22/01377/FUL Land at Manor Farm: erection of 9 residential properties	Strategic access improvements across a range of modes	Low	Minor	Slight beneficial (not significant)
	Summary of effects assessment	Access for these receptors will be improved through the implementation of the Scheme (see General Arrangements Plans (application document TR010063/APP/2.9)). In general terms, improvements relate to the increased capacity of the road network, reduced congestion, and increased journey time reliability, coupled with improvements to bus infrastructure and enhancement to walking and cycling access and movement through the study area and between these receptors and other destinations. This is considered to result in a minor beneficial impact as the properties are not yet implemented and the Scheme is not considered to be fundamental to its implementation. DMRB LA104 allows for the resultant effect to be assessed as neutral or slight due to this combination of sensitivity and magnitude of impact. Due to the Scheme increasing capacity on the road network which will benefit the proposed properties, the resultant effect is likely to be **slight beneficial which is not significant**.		
		Embedded mitigation: None proposed. **Essential mitigation:** No specific additional mitigation measures are proposed.		
	Residual effects assessment (effect + essential mitigation)	No essential mitigation has been proposed for access. The residual effects assessment remains unchanged from the main assessment for access effects and is **slight beneficial**, which is not significant.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
- Planning application 22/00474/FUL Douglas Equipment: proposed 71 residential properties - Wentworth Court	Strategic access improvements across a range of modes	High	Minor	Slight beneficial (not significant)
	Summary of effects assessment	Access for these receptors will be improved through the implementation of the Scheme (see General Arrangements Plans (application document TR010063/APP/2.9)). In general terms, improvements relate to the increased capacity of the road network, reduced congestion, and increased journey time reliability, coupled with enhancement to walking and cycling access and movement through the study area and between these receptors and other destinations. DMRB LA104 allows for the selection of slight or moderate beneficial effects for this combination of sensitivity and impact magnitude. In this instance, due to the characteristics of Wentworth Court as a residential care home with fewer journeys anticipated by residents than other residential types; and recognising that the proposed development site is not yet implemented and the Scheme is not considered fundamental to its implementation, the assessment concludes **slight beneficial effects**, which are not significant.		
		Embedded mitigation: None proposed **Essential mitigation:** No specific additional mitigation measures are proposed.		
	Residual effects assessment (effect + essential mitigation)	No essential mitigation has been proposed for access. The residual effects assessment remains unchanged from the main assessment for access effects and is **slight beneficial**, which is not significant.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
- Knightsbridge Lodge	Strategic access improvements across a range of modes	High	Minor beneficial	Slight beneficial (not significant)
	Summary of effects assessment	Access for this receptor will be improved through the implementation of the Scheme (see General Arrangements Plans (application document TR010063/APP/2.9)). In general terms, improvements relate to the increased capacity of the road network, reduced congestion, and increased journey time reliability, coupled with enhancement to walking and cycling access and movement through the study area and between these receptors and other destinations. DMRB LA104 allows for the selection of slight or moderate beneficial effects for this combination of sensitivity and impact magnitude. In this instance, due to the characteristics of Knightsbridge as a residential care home with fewer journeys anticipated by residents than other residential types; and recognising that the proposed development site is not yet implemented and the Scheme is not considered fundamental to its implementation, the assessment concludes **slight beneficial effects**, which are not significant.		
		Embedded mitigation: None proposed. **Essential mitigation:** No specific additional mitigation measures are proposed.		
	Residual effects assessment (effect + essential mitigation)	No essential mitigation has been proposed for access. The residual effects assessment remains unchanged from the main assessment for access effects and is **slight beneficial**, which is not significant.		

Community land and assets

Construction

13.9.12. The assessment of the level of construction impact and resultant effects is detailed in Table 13-13. This relates to consideration of the Scheme and embedded mitigation (see Section 13.10).

13.9.13. Where necessary, essential mitigation is noted. This is then taken into account in deriving an overall residual effects assessment score.

Operation

13.9.14. The assessment of the level of operational impacts and resultant effects is detailed in Table 13-14.

Table 13-13 – Residual effects of construction activities on Community Land and Assets

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Community Facilities - All Saints Academy (sports and education facilities) - Uckington and Elmstone Hardwicke Village Hall - Circle of Light place of worship - St Mary Magdalene Church - Hayden Road Allotments - Independent Living Centre - Giggles Nursery/ Creche	Temporary disruptions to access due to construction works and traffic management	Medium	Minor adverse	Slight adverse (not significant) Temporary, indirect, and reversible
	Summary of effects assessment	The disruption to access to these community facilities relates principally to the presence of construction works on the A4019 – there are alternative access routes available for these receptors and traffic management is intended to ensure traffic can continue to use the A4019 during construction. Traffic management arrangements will also affect access routes to the B4634 which could disrupt access to Hayden Road Allotments and All Saints Academy on a temporary basis. There are some alternative routes available for these receptors, particularly from the east, albeit that these would pass through predominantly residential areas. The movements of WCH are also accommodated within the traffic management, including specific reference to the need to accommodate safe and convenient movement for mobility impaired through areas under traffic management. Embedded mitigation includes targeted community engagement to provide advance notice of works activities to allow forward planning of journeys to be effective. Construction signage strategies are to include directional markers for community facilities. The magnitude of impact would be minor adverse. There will be temporary severance for residents wishing to access community facilities from within the study area by a range of modes, including walking, cycling and public transport. These disruptions to access will be temporary and reversible. The assessment concludes a **slight adverse effect** which is not significant.		
		Embedded mitigation: Refer to mitigation ref. G1, PHH2, PHH3, PHH4, PHH5, PHH6, PHH7, PHH9, PHH10, G10, PHH13, PHH17, PHH18, SD6 and SD7 in Table 13-19. **Essential mitigation:** No specific additional mitigation measures are proposed.		
	Residual effects assessment (effect + essential mitigation)	No essential mitigation has been proposed for access. The residual effects assessment remains unchanged from the main assessment for access effects and is **slight adverse**, which is not significant.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Community Facilities - George Reading Play Area - Pilgrove Way Playground - Energie Fitness Cheltenham - Sports Direct Fitness - Boots Pharmacy - Springbank Surgery - Cheltenham Pharmacy - NHS Gloucester Community Dental Services	Temporary disruptions to access due to construction works and traffic management	Low	Minor	Slight adverse (not significant) Temporary, indirect and reversible
	Summary of effects assessment	Traffic management arrangement measures during the presence of construction works on the A4019 will affect access routes and traffic/WCH flow on the A4019 and the B4634 on a temporary basis. These receptors are towards the south-east of the Order limits and there are alternative access routes to these receptors. The movements of WCH are also accommodated within the traffic management, including specific reference to the need to accommodate safe and convenient movement for mobility impaired through areas under traffic management. Embedded mitigation includes targeted community engagement to provide advance notice of works activities to allow forward planning of journeys to be effective. Construction signage strategies are to include directional markers for community facilities. The magnitude of impact would be minor adverse. There will be temporary severance (disruptions and diversions, depending on mode and route of approach) for some residents wishing to access the gyms and playgrounds and healthcare facilities from within the study area by a range of modes, including walking, cycling and public transport. These disruptions to access will be temporary and reversible. DMRB LA104 allows for the selection of neutral or slight adverse effects for this combination of sensitivity and magnitude of impacts. On the basis that the user groups are likely to include children travelling in pushchairs, for which traffic management can be more challenging to negotiate, the assessment concludes a **slight adverse effect** which is not significant.		
		Embedded mitigation: Refer to mitigation ref. G1, PHH2, PHH3, PHH4, PHH5, PHH6, PHH7, PHH9, PHH13, PHH17, PHH18 and G10 in Table 13-19. **Essential mitigation:** No specific additional mitigation measures are proposed.		
	Residual effects assessment (effect + essential mitigation)	No essential mitigation has been proposed for access. The residual effects assessment remains unchanged from the main assessment for access effects and is **slight adverse**, which is not significant.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Community Facilities - Greensteps National Star	Temporary disruptions to access due to construction works and traffic management Permanent land take	Low	Access: minor adverse Land take: minor adverse	Access: slight adverse (not significant) Land take: slight adverse (not significant) Temporary, indirect, and reversible (access). Permanent, indirect, and irreversible (land take)
	Summary of effects assessment	The disruption to access to these community facilities relates principally to the presence of construction works on the A4019, affecting the access route to the premises from the south – there is an alternative access route available for this receptor through Gallagher Retail Park to the east and traffic management is intended to ensure traffic can continue to use the A4019 during construction; and that access to all community receptors is maintained for all modes. The movements of WCH are also accommodated within the traffic management, including specific reference to the need to accommodate safe and convenient movement for mobility impaired through areas under traffic management. Embedded mitigation includes targeted community engagement to provide advance notice of works activities to allow forward planning of journeys to be effective. Construction signage strategies are to include directional markers for community facilities. The magnitude of the access impact would be minor adverse. There will be temporary severance for those wishing to access the premises from within the study area by a range of modes, including walking, cycling and public transport. These disruptions to access will be temporary and reversible. DMRB LA104 allows for the selection of neutral or slight adverse effects for this combination of sensitivity and impact magnitude. On the basis that there will be some disruption and reduced access, the assessment concludes a **slight adverse effect** which is not significant. A small part of the southern curtilage of the premises is within the permanent land take for the Scheme. The loss of this land will not affect the operation of the facility. The magnitude of impact is minor adverse. DMRB LA104 allows for the selection of neutral or slight adverse effects for this combination of sensitivity and impact magnitude. On the basis that there will be a requirement to amend the site boundary to reflect the land take, the assessment concludes a **slight adverse effect** which is not significant.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
		Embedded mitigation: Refer to mitigation ref. G1, PHH2, PHH3, PHH4, PHH5, PHH6, PHH7, PHH9, PHH13, PHH17, PHH18 and G10 in Table 13-19. **Essential mitigation:** No specific additional mitigation measures are proposed.		
	Residual effects assessment (effect + essential mitigation)	No essential mitigation has been proposed for access. The residual effects assessment remains unchanged from the main assessment for access effects and is **slight adverse**, which is not significant. No essential mitigation has been proposed for land take. The residual effects assessment remains unchanged from the main assessment for land take effects and is **slight adverse,** which is not significant.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Community Facilities - Cheltenham Civil Service Tennis and Football Clubs	Temporary disruptions to access	High	Moderate adverse	Moderate adverse (significant) Temporary, indirect, and reversible
	Summary of effects assessment	Currently there is no signalised junction at the Cheltenham Civil Service Tennis and Football Clubs, and vehicles access/egress directly onto the A4019 – there are no alternatives to access the car park. Works to the A4019 at the junction with proposed Site Access B will result in temporary disruption to this access arrangement. Traffic management arrangement measures during the presence of construction works on the A4019 will affect access routes and traffic/WCH flow on the A4019 and the B4634 on a temporary basis. The movements of WCH are also accommodated within the traffic management, including specific reference to the need to accommodate safe and convenient movement for mobility impaired through areas under traffic management. Embedded mitigation includes targeted community engagement to provide advance notice of works activities to allow forward planning of journeys to be effective. Construction signage strategies are to include directional markers for community facilities. The magnitude of impact for the disruption to access to the Cheltenham Civil Service Tennis and Football Clubs would be moderate adverse. DMRB LA 104 allows for the selection of moderate or large adverse for the effects assessment based on this combination of sensitivity and impact magnitude. There will be temporary severance for residents wishing to access community facilities within the study area. These disruptions to access will be temporary and reversible. Due to the impact being temporary in duration and drawing on findings from consultation, the assessment concludes a **moderate adverse effect** which is significant.		
		Embedded mitigation: Refer to mitigation ref. G1, PHH3, PHH4, PHH5, PHH6, PHH7, PHH9, PHH10, PHH17, PHH18 and G10 in Table 13-19. **Essential mitigation:** Contractor to develop and implement temporary traffic management measures provide continuity of access and egress for all community facilities during the construction stage. This includes for the Cheltenham Civil Service Tennis and Football Clubs (refer to mitigation ref. PHH2)		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
		PLO to prioritise direct liaison with operators/lessees of community facilities/premises anticipated to experience direct impacts on access during the construction phase, to ensure that suitable access and egress to their property is available at all times during the construction phase, for all relevant activities (i.e. staff/operator and patron access, deliveries and servicing). (refer to mitigation ref. PHH13).		
	Residual effects assessment (effect + essential mitigation)	The residual effects assessment for the access impacts, taking into account embedded and essential mitigation measures (which include for targeted contractor engagement with the receptor and response within the traffic management plan), is **slight adverse** which is not significant.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Community Facilities - West Cheltenham Fire Station	Temporary disruptions to access	High	Moderate adverse	Large adverse (significant) Temporary, indirect, and reversible
	Summary of effects assessment	Currently emergency vehicles have a dedicated egress with yellow hatch and signals to allow direct priority egress to the A4019 in either direction. Staff and visitor access is via an un-signalised junction to the A4019, a short distance to the east. Works to the A4019 both at the existing emergency vehicle access/egress and at the staff and visitor access/egress will result in temporary disruption to these access arrangements. Traffic management arrangement measures during the presence of construction works on the A4019 will affect access routes and traffic/WCH flow on the A4019 and the B4634 on a temporary basis. The movements of WCH are also accommodated within the traffic management, including specific reference to the need to accommodate safe and convenient movement for mobility impaired through areas under traffic management. Embedded mitigation includes targeted community engagement to provide advance notice of works activities to allow forward planning of journeys to be effective. Construction signage strategies are to include directional markers for community facilities. The magnitude of impact for the disruption to access to the Cheltenham Civil Service Tennis and Football Clubs would be moderate adverse. DMRB LA 104 allows for the selection of moderate or large adverse for the effects assessment, based on this combination of sensitivity and magnitude of impact. There will be temporary severance for staff and visitors within the study area; and interruption to ease of egress for emergency vehicles. These disruptions to access will be temporary and reversible. Although the impact is temporary in duration, the nature of the use (i.e. requirement to provide emergency response), the assessment concludes a **large adverse effect** which is significant.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
		Embedded mitigation: Refer to mitigation ref. G1, PHH2, PHH3, PHH4, PHH5, PHH6, PHH7, PHH9, PHH10, PHH17, PHH18 and G10 in Table 13-19. **Essential mitigation:** Contractor to develop and implement an emergency vehicle movement plan as part of traffic management along the A4019 during construction. This will need to apply to all emergency vehicles seeking to move through the Order limits under Blue Lights, and also egress from the West Cheltenham Fire Station for emergency response vehicles (refer to mitigation ref. PHH1) PLO to prioritise direct liaison with operators/lessees of community facilities/premises anticipated to experience direct impacts on access during the construction phase, to ensure that suitable access and egress to their property is available at all times during the construction phase, for all relevant activities (i.e. staff/operator and patron access, deliveries and servicing). (refer to mitigation ref. PHH13).		
	Residual effects assessment (effect + essential mitigation)	The residual effects assessment for the access impacts, taking into account embedded and essential mitigation measures (which include for an emergency vehicle movement plan), is **moderate adverse** which is significant. This is a precautionary assessment, reflecting that depending on the detail of the emergency movement plan, some delay in response times may be expected particularly if a response happens to coincide with a time when movement through works areas is delayed/impeded by construction activities.		

Table 13-14 – Residual effects of operational activities on Community Land and Assets

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude including embedded mitigation)	Effect (Scheme + embedded mitigation)
Community Facilities - All Saints Academy (sports and education) - Uckington and Elmstone Hardwicke Village Hall - Circle of Light place of worship - St Mary Magdalene Church - Hayden Road Allotments - Independent Living Centre - Giggles Nursery/ Creche	Strategic access improvements across a range of modes	Medium	Minor beneficial	Slight beneficial (not significant)
	Summary of effects assessment	Access for these receptors will be improved through the implementation of the Scheme (see General Arrangements Plans (application document TR010063/APP/2.9)). In general terms, improvements relate to the increased capacity of the road network, reduced congestion, and increased journey time reliability, coupled with enhancement to walking and cycling access and movement through the study area and between these receptors and other destinations. The junction providing access to the A4019 from Uckington will be signalised which should benefit access to Uckington and Elmstone Hardwicke Village Hall and Circle of Light from the south by improving journey time reliability and safety of crossing movements for motorists. Walking and cycling connectivity will also be enhanced with access to the continuous shared use path alongside the northern carriageway of the A4019, which includes crossing phases within major junctions. The Link Road will provide increased capacity for vehicles to access destinations to the south of M5 Junction 10, including Boddington. The improvement in accessibility will result in a minor magnitude of impact. The resultant effect is assessed as **slight beneficial** and not significant.		
		Embedded mitigation: Refer to mitigation ref. PHH17, SD1, SD2 (1-3) and SD3 in Table 13-19. **Essential mitigation:** No specific additional mitigation measures are proposed.		
	Residual effects assessment (effect + essential mitigation)	No essential mitigation has been proposed for access. The residual effects assessment remains unchanged from the main assessment for access effects and is **slight beneficial**, which is not significant.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude including embedded mitigation)	Effect (Scheme + embedded mitigation)
Community Facilities - Greensteps National Star	Access: strategic access improvements across a range of modes Land take: permanent change to southern curtilage	Medium	Access: minor beneficial Land take: negligible	Access: slight beneficial (not significant) Land take: slight adverse (not significant)
	Summary of effects assessment	Access for this receptor will be improved through the implementation of the Scheme (see General Arrangements Plans (application document TR010063/APP/2.9)). In general terms, improvements relate to the increased capacity of the road network, reduced congestion, and increased journey time reliability, coupled with enhancement to walking and cycling access and movement through the study area and between these receptors and other destinations. The junction providing access to the A4019 from Uckington will be signalised which should benefit access to the premises from the south by improving journey time reliability and safety of crossing movements for motorists. Walking and cycling connectivity will also be enhanced with access to the continuous shared use path alongside the northern carriageway of the A4019, which includes crossing phases within major junctions. The Link Road will provide increased capacity for vehicles to access destinations to the south of M5 Junction 10, including Boddington. The improvement in accessibility will result in a minor magnitude of impact. The resultant access effect is assessed as **slight beneficial** and not significant. The land take required from this receptor will manifest in the construction phase. It affects a small part of the southern curtilage of the premises and will not affect the operation of the facility. Once the Scheme is operational, the magnitude of this impact is considered negligible. DMRB LA104 allows the selection of neutral or slight adverse effects for this combination of sensitivity and impact magnitude. In this instance, in recognition of the change that will take place and noting the user group of the receptor, who may be less able to readily adapt to change, the assessment concludes a **slight adverse effect**, which is not significant.		
		Embedded mitigation: Refer to mitigation ref. PHH17, SD1, SD2 (1-3), SD3 and SD5 in Table 13-19. **Essential mitigation:** No specific additional mitigation measures are proposed.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude including embedded mitigation)	Effect (Scheme + embedded mitigation)
	Residual effects assessment (effect + essential mitigation)	No essential mitigation has been proposed for access. The residual effects assessment remains unchanged from the main assessment for access effects and is **slight beneficial**, which is not significant. No essential mitigation has been proposed for land take. The residual effects assessment remains unchanged from the main assessment for land take effects and is **slight adverse**, which is not significant.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Community Facilities - George Reading Play Area - Pilgrove Way Playground - Energie Fitness Cheltenham - Sports Direct Fitness - Boots Pharmacy - Springbank Surgery - Cheltenham Pharmacy - NHS Gloucester Community Dental Services	Strategic access improvements across a range of modes	Low	Minor	Slight beneficial (not significant)
	Summary of effects assessment	Access for these receptors will be improved through the implementation of the Scheme (see General Arrangements Plans (application document TR010063/APP/2.9)). In general terms, improvements relate to the increased capacity of the road network, reduced congestion, and increased journey time reliability, coupled with enhancement to walking and cycling access on a network-wide basis and movement through the study area and between these receptors and other destinations. Walking and cycling connectivity will also be enhanced with access to the continuous shared use path alongside the northern carriageway of the A4019, which includes crossing phases within major junctions. The Link Road will provide increased capacity for vehicles to access destinations to the south of M5 Junction 10, including Boddington. The improvement in accessibility will result in a minor magnitude of impact. DMRB LA104 allows for the selection of neutral or slight beneficial effects for this combination of sensitivity and impact magnitude. In this instance, in recognition of the multi-modal improvements of the Scheme that will benefit the study area and beyond, the resultant effect is assessed as **slight beneficial** and not significant.		
		Embedded mitigation: Refer to mitigation ref. PHH17, SD3 and SD3 in Table 13-19. **Essential mitigation:** No specific additional mitigation measures are proposed.		
	Residual effects assessment (effect + essential mitigation)	No essential mitigation has been proposed for access. The residual effects assessment remains unchanged from the main assessment for access effects and is **slight beneficial**, which is not significant.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Community Facilities - Cheltenham Civil Service Tennis and Football Clubs - West Cheltenham Fire Station	Strategic access improvements across a range of modes	High	Moderate beneficial	Moderate beneficial (significant)
	Summary of effects assessment	The design for the section of the A4019 that includes the access to/from the Civil Service Tennis and Football Clubs has been progressed to a level of detail that includes proposed road markings. Upon completion of construction, vehicles would be able to enter the facility from either direction off the A4019 via the new signalised cross-roads junction at Site Access B. Vehicles leaving the facility car park would exit onto the new service road – and then onto the A4019. The service road traffic would have priority over vehicles leaving the Cheltenham Civil Service Tennis and Football Clubs. The signalisation of the junction was noted as a positive aspect within consultation as it offers improved arrangements for accessing the A4019 in terms of journey time and safety. The design for the section of the A4019 that includes the emergency vehicle egress from the West Cheltenham Fire Station reinstates the yellow hatch and signals to suit the revised carriageway design, enabling priority access onto the A4019 in both directions. Staff and visitor access will be routed along the service road parallel to the southern A4019 carriageway, connecting to the A4019 via a new signalised cross-roads junction at Site Access B. As noted above, the signalisation of access onto the A4019 offers improved arrangements in terms of journey time and safety. Access for these receptors in a more general sense will be improved through the implementation of the Scheme – proposed improvements relate to the increased capacity of the road network, reduced congestion, and increased journey time reliability, coupled with enhancement to walking and cycling access and movement through the study area and between these receptors and other destinations. Walking and cycling connectivity will also be enhanced with access to the continuous shared use path alongside the northern carriageway of the A4019, which includes crossing phases within major junctions. The reduced congestion will also benefit response times for emergency services vehicles associated with West Cheltenham Fire Station using the A4019 and the wider road network in and around the study area. Taken together, these aspects of the Scheme will deliver a moderate magnitude of impact. DMRB LA104 allows for the selection of moderate or large beneficial effects for this combination of sensitivity and impact magnitude. Due to the number of potential users and the nature of the community facilities, on balance the assessment concludes a **moderate beneficial effect** which is significant**.** It should be noted that, regarding West Cheltenham Fire Station, the moderate beneficial effect is not likely to apply to the movement of emergency vehicles themselves. A **slight beneficial effect** is envisaged here due to these vehicles operating movements on the road network using blue lights, but in recognition of the anticipated improvement in vehicle flow and additional road width.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
		Embedded mitigation: Refer to mitigation ref. PHH17, SD1, SD2, SD3 (refer to bus stops Stanboro Lane, Withybridge Lane and Cooks Lane) in Table 13-19. **Essential mitigation:** No specific additional mitigation measures are proposed.		
	Residual effects assessment (effect + essential mitigation)	No essential mitigation has been proposed for access. The residual effects assessment remains unchanged from the main assessment for access effects and is **moderate beneficial**, which is significant.		

Development land and businesses

Construction

13.9.15. The assessment of the level of construction impact and resultant effects is detailed in Table 13-15. This relates to consideration of the Scheme and embedded mitigation (see Section 13.10).

13.9.16. Where necessary, essential mitigation is noted. This is then taken into account in deriving an overall residual effects assessment score.

Operation

13.9.17. The assessment of the level of operational impacts and resultant effects is detailed in Table 13-16.

Table 13-15 – Residual effects of construction activities on development land and business

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Commercial / industrial premises - Businesses at Kingsditch Trading Estate - Businesses at Gallagher Retail Park[21]	Access: Temporary disruptions to access due to construction works and traffic management Land take: land take at south-western boundary of Gallagher Retail Park (note – this does not affect Kingsditch Trading Estate)	Very high	Access: minor adverse Land take: negligible adverse	Access: moderate adverse (significant) Temporary, direct, and indirect and reversible Land take: slight adverse (not significant) Permanent, direct, and irreversible
	Summary of effects assessment	These receptors may experience temporary disruptions to access as a consequence of construction works on the A4019 and associated traffic management arrangements to maintain through flow of traffic, including buses, but under constrained carriageway widths, particularly from the west. Traffic management arrangements will also affect access routes to the A4019 during the construction phase. The Scheme involves reconfiguration of the Gallagher Junction, which provides the western access point into Gallagher Retail Park – this will also disrupt access into the receptor and could affect movement of traffic within the car parking areas. Alternative access routes are available through the two retail parks, from the east. Embedded mitigation includes targeted community engagement to provide advance notice of works activities to allow forward planning of journeys to be effective. Signage strategies for key destinations are part of the construction traffic management arrangement requirements. The magnitude of impact for the disruption to access to these businesses would be minor adverse, recognising that an alternative access is available into Kingsditch Trading Estate and Gallagher Retail Park at a point to the east of the Order limits. DMRB LA 104 allows for the selection of moderate or large adverse for the effects assessment on the basis of this combination of sensitivity and impact magnitude. In this instance, due to the temporary and reversible nature of the impact and availability of alternative access, despite the relatively large number of businesses affected, the assessment concludes a **moderate adverse effect** which is significant. The Scheme requires a small amount of land to the south-west corner of the Gallagher Retail Park, to the rear of the Sainsbury service yard. The land will be required permanently and necessitate a realignment of the boundary fence in this location. The land take is not considered to interfere with the current operational		

[21] Various constituent businesses have been identified as having a lower sensitivity, however the assessment is undertaken on the basis of the retail destination, which comprises multiple businesses.

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
		arrangements for the business and is assessed as a negligible adverse magnitude of impact. The resultant effect is assessed as **slight adverse**, for the Gallagher Retail Park receptors only, which is not significant.		
		Embedded mitigation: Refer to mitigation ref. PHH3, PHH4, PHH5, PHH6, PHH10, PHH15, SD6, SD7 in Table 13-19.. **Essential mitigation:** PLO to prioritise direct liaison with owners/lessees of business premises anticipated to experience direct impacts on access during the construction phase, to ensure that suitable access and egress to their property is available at all times during the construction phase, for all relevant business activities (i.e., staff and patron access, deliveries and servicing) (ref: PHH12).		
	Residual effects assessment (effect + essential mitigation)	The residual effects assessment for the access impacts, taking into account embedded and essential mitigation measures (which include for targeted engagement with the businesses to secure unimpeded access for all relevant business activities), is **moderate adverse** which is significant. This is a precautionary assessment, reflecting that depending on the detail of the access arrangements, some interference/inconvenience for certain types of access may be expected, particularly during the works to alter the site boundary. No essential mitigation has been proposed for land take. The residual effects assessment remains unchanged from the main assessment for access effects and is **slight adverse**, which is not significant.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Commercial / industrial premises - Gloucester Detailing valeting service - Sheldon Nurseries (commercial premises for rental)	Permanent land take and demolition	Medium	Major adverse	Large adverse (significant) Permanent direct and irreversible
	Summary of effects assessment	The receptors lie within the Order limits, and form part of the permanent footprint for the Scheme. They will require demolition to facilitate the Scheme. This represents a major adverse magnitude of impact. DMRB LA 104 allows for the selection of a moderate or large adverse effect for this combination of sensitivity and impact magnitude. Sheldon Nurseries has ceased trading and there is a small number of businesses affected, but the impacts prevent their continued viability thus the assessment concludes a **large adverse effect** which is significant.		
		Embedded mitigation: Refer to mitigation ref. PHH4 and PHH9 in Table 13-19. **Essential mitigation:** No specific additional mitigation measures are proposed. Compensation is required for the compulsory purchase		
	Residual effects assessment (effect + essential mitigation)	The residual effects assessment is **large adverse**, which is significant. Compensation is required for the compulsory purchase.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Commercial / industrial premises - Knightsbridge Nurseries	Temporary disruptions to access due to construction works and traffic management	Medium	Minor adverse	Slight adverse (not significant) Temporary direct and indirect and reversible
	Summary of effects assessment	There is an outline planning application for housing on this Site, see receptor 23/00328/OUT (46 residential properties). The approval of the planning application would result in the closure and demolition of this receptor, prior to the construction of the Scheme, which would be attributed to the development proposals rather than the Scheme. As the potential closure of the business and the demolition of the premises will be a result of development proposals, this impact has been scoped out of this assessment. If the planning application is refused and the business receptor remains in operation, this receptor may experience temporary disruptions to access as a consequence of construction works on the A4019 and M5 Junction 10 and associated traffic management arrangements to maintain through flow of traffic, including buses, but under constrained carriageway widths, particularly from the west. Traffic management arrangements will also affect access routes to the A4019 during the construction phase. The movements of WCH are also accommodated within the traffic management, including specific reference to the need to accommodate safe and convenient movement for mobility impaired through areas under traffic management. Embedded mitigation includes targeted community engagement to provide advance notice of works activities to allow forward planning of journeys to be effective. Construction signage strategies are to include directional markers for businesses. The magnitude of impact would therefore be minor adverse. These disruptions to access will be temporary and reversible. The assessment concludes a **slight adverse effect** which is not significant.		
		Embedded mitigation: Refer to mitigation ref. PHH4, PHH5, G1, PHH6, PHH9, PHH10, G10, PHH12, G11, SD6 and SD7 in Table 13-19. **Essential mitigation:** PLO to prioritise direct liaison with owners/lessees of business premises anticipated to experience direct impacts on access during the construction phase, to ensure that suitable access and egress to their property is available at all times during the construction phase, for all relevant business activities (i.e. staff and patron access, deliveries and servicing) (refer to mitigation ref. PHH12).		

Residual effects assessment (effect + essential mitigation)	There is no residual effects assessment for the closure and demolition of this receptor, as the closure and demolition of the receptor will be a result of proposed development proposals rather than the Scheme. The residual effects assessment for the access impacts, taking into account embedded and essential mitigation measures (which include for targeted engagement with the businesses to secure unimpeded access for all relevant business activities), is slight adverse which is not significant.

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Commercial / industrial premises - Comfy Campers van hire company - Distinctive Ironwork blacksmith - Cheltenham Auto Services vehicle repair shop - Gloucester Old Spot pub - Stanboro Cottage Fish Farm - The House in The Tree pub - Holmedale Guest House - Elmstone Business Park - Arle Nursery - Cheltenham Fencing	Temporary disruptions to access due to construction works and traffic management	Medium	Minor adverse	Slight adverse (not significant) Temporary, direct, and indirect and reversible
	Summary of effects assessment	These receptors may experience temporary disruptions to access as a consequence of construction works on the A4019 and M5 Junction 10 and associated traffic management arrangements to maintain through flow of traffic, including buses, but under constrained carriageway widths, particularly from the west. Traffic management arrangements will also affect access routes to the A4019 during the construction phase, including the B4634. The movements of WCH are also accommodated within the traffic management, including specific reference to the need to accommodate safe and convenient movement for mobility impaired through areas under traffic management. Bus stop provision close to Cooks Lane represents the closest public transport node to the business receptors on the A4019 (Comfy Campers, Distinctive Ironwork and Cheltenham Auto Services) and will be closed permanently during the construction phase – the closest alternative will be to the east towards Uckington. The Link Road will form a junction with the B4634 – when these connection works are undertaken, there will be disruption to traffic flow along the B4634, which could disrupt access to the House in the Tree pub, Arle Nursery and Holmedale Guest House on a temporary basis. There are alternative access routes available for the southern receptors and traffic management is intended to ensure traffic can continue to use the A4019 during construction. Embedded mitigation includes targeted community engagement to provide advance notice of works activities to allow forward planning of journeys to be effective. Construction signage strategies are to include directional markers for businesses. The magnitude of impact would therefore be minor adverse. These disruptions to access will be temporary and reversible. The assessment concludes a **slight adverse effect** which is not significant.		
		Embedded mitigation: Refer to mitigation ref. PHH4, PHH5, G1, PHH6, PHH9, PHH10, G10, PHH12, G11, SD6 and SD7 in Table 13-19. **Essential mitigation:**		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
		PLO to prioritise direct liaison with owners/lessees of business premises anticipated to experience direct impacts on access during the construction phase, to ensure that suitable access and egress to their property is available at all times during the construction phase, for all relevant business activities (i.e. staff and patron access, deliveries and servicing) (refer to mitigation ref. PHH12).		
	Residual effects assessment (effect + essential mitigation)	The residual effects assessment for the access impacts, taking into account embedded and essential mitigation measures (which include for targeted engagement with the businesses to secure unimpeded access for all relevant business activities), is **slight adverse** which is not significant.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Commercial / industrial premises - Gateway Retail Park - Applegreen filling station, car and motorcycle dealership and restaurant - Premier Inn Cheltenham and eateries	Temporary disruptions to access due to construction works and traffic management	Medium	Minor adverse	Slight adverse (not significant) Temporary, direct, and indirect and reversible
	Summary of effects assessment	These receptors may experience temporary disruptions to access as a consequence of construction works on the A4019 and associated traffic management arrangements to maintain through flow of traffic, including buses, but under constrained carriageway widths, particularly from the west. Traffic management arrangements will also affect access routes to the A4019 during the construction phase. The movements of WCH are also accommodated within the traffic management, including specific reference to the need to accommodate safe and convenient movement for mobility impaired through areas under traffic management. Embedded mitigation includes targeted community engagement to provide advance notice of works activities to allow forward planning of journeys to be effective. Construction signage strategies are to include directional markers for businesses. The magnitude of impact for the disruption to access to these businesses would be minor adverse, recognising that an alternative access is available. These disruptions to access will be temporary and reversible. The assessment concludes a **slight adverse effect** which is not significant.		
		Embedded mitigation: Refer to mitigation ref. PHH4, PHH5, G1, PHH6, PHH9, PHH10, G10, PHH12, G11, SD6 and SD7 in Table 13-19. **Essential mitigation:** PLO to prioritise direct liaison with owners/lessees of business premises anticipated to experience direct impacts on access during the construction phase, to ensure that suitable access and egress to their property is available at all times during the construction phase, for all relevant business activities (i.e. staff and patron access, deliveries and servicing).		
	Residual effects assessment (effect + essential mitigation)	The residual effects assessment for the access impacts, taking into account embedded and essential mitigation measures (which include for targeted engagement with the businesses to secure unimpeded access for all relevant business activities), is **slight adverse** which is not significant.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Commercial / industrial premises - Aldi, car dealership and service centre and private gym, west of A4019 and B4634 junction - Bailey's nursery, to the north of A4019, west of Gallagher Retail Park	Access: temporary disruptions to access due to construction works and traffic management Land take: land take from receptors to facilitate new junctions to the A4019/ at the A4019 B4634 junction	High	Access: minor adverse Land take: negligible adverse	Moderate adverse (significant) for access Temporary, indirect, and reversible Slight adverse (not significant) for land take Permanent, direct, and irreversible
	Summary of effects assessment	These receptors may experience temporary disruptions to access as a consequence of construction works on the A4019 and associated traffic management arrangements to maintain through flow of traffic, including buses, but under constrained carriageway widths, particularly from the west. Traffic management arrangements will also affect access routes to the A4019 during the construction phase, including the junction and approach from the B4634, which is where the access to one of the receptors is situated. The movements of WCH are also accommodated within the traffic management, including specific reference to the need to accommodate safe and convenient movement for mobility impaired through areas under traffic management. Embedded mitigation includes targeted community engagement to provide advance notice of works activities to allow forward planning of journeys to be effective. Construction signage strategies are to include directional markers for businesses. The magnitude of impact for the disruption to access to these businesses would be minor adverse, recognising that the traffic management is required to maintain access to all businesses during construction. DMRB LA 104 allows for the selection of slight or moderate adverse for the effects assessment based on this combination of sensitivity and magnitude of impact. In this instance, due to the temporary and reversible nature of the access impact but recognising the proximity of the accesses to the junction works, despite the relatively small number of businesses affected, the assessment concludes a **moderate adverse effect** which is significant. The Scheme involves reconfiguration of the Gallagher Junction, which is adjacent to the eastern corner of the receptor. The Scheme requires a small amount of land comprising fence and verge to the eastern curtilage of the site that includes Aldi, where it borders the A4019 and B4634, to allow for the reconfiguration of the Gallagher junction. The land will be required permanently and necessitate a realignment of the boundary fence in this location. The land take is not considered to interfere with the current operational arrangements for the			

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
		businesses (Aldi is the closest) and is assessed as a negligible magnitude of impact. There is also a requirement for land take from Bailey's nursery – this affects the landholding rather than the nursery business premises and the impact of land take on agricultural land is addressed in Chapter 10 - Geology and Soils (application document TR010063/APP/6.8) and not replicated here. The magnitude of impact on the nursery buildings themselves is negligible. This combination of sensitivity and magnitude of impact results in a **slight adverse effect**, which is not significant.		
		Embedded mitigation: Refer to mitigation ref. PHH4, PHH5, G1, PHH6 PHH9, PHH10, G10, PHH12, G11, SD6 and SD7 in Table 13-19. **Essential mitigation:** PLO to prioritise direct liaison with owners/lessees of business premises anticipated to experience direct impacts on access during the construction phase, to ensure that suitable access and egress to their property is available at all times during the construction phase, for all relevant business activities (i.e., staff and patron access, deliveries and servicing) (refer to mitigation ref. PHH12)		
	Residual effects assessment (effect + essential mitigation)	The residual effects assessment for the access impacts, taking into account embedded and essential mitigation measures (which include for targeted engagement with the businesses to secure unimpeded access for all relevant business activities), is **slight adverse** which is not significant. No essential mitigation has been proposed for land take. The residual effects assessment remains unchanged from the main assessment for access effects and is **slight adverse**, which is not significant. Note that the d take impact on the agricultural land at Bailey's Nursery is addressed separately in Chapter 10 of the ES - Geology and Soils (application document TR010063/APP/6.8) and not replicated here.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Commercial / industrial premises - Junction 10 breakfast van	Land take of regular trading location	Low	Major adverse	Moderate adverse (significant) Permanent and irreversible.
	Summary of effects assessment	The receptor has a regular trading location within a layby on the eastern approach to M5 Junction 10, with all business marketing material and online trading presence connecting the business to this location. The layby is within the Order limits as part of the permanent footprint for the Scheme and will become inaccessible during the construction phase. The Scheme does not include a replacement layby. The magnitude of impact for the loss of the regular trading location is assessed as major adverse. DMRB LA 104 allows for the selection of either slight or moderate for the effects assessment based on this combination of sensitivity and magnitude of impact. The layby will become permanently unavailable within the construction phase, necessitating the closure or relocation of the business – given the nature of the receptor as a mobile business, there is greater flexibility in its siting when compared to those with a fixed position. The assessment concludes a **moderate adverse effect,** which is significant.		
		Embedded mitigation: Refer to mitigation ref. PHH4, PHH9 and G10 in Table 13-19. **Essential mitigation:** PLO to prioritise direct liaison with owners/lessees of business premises anticipated to experience direct impacts on access during the construction phase, to ensure that suitable access and egress to their property is available at all times during the construction phase, for all relevant business activities (i.e. staff and patron access, deliveries and servicing) (refer to mitigation ref. PHH12).		
	Residual effects assessment (effect + essential mitigation)	The residual effects assessment for the land take impacts, taking into account embedded and essential mitigation measures (which include for targeted engagement with the businesses to secure unimpeded access for all relevant business activities), is **moderate adverse** which is significant. This is a precautionary assessment recognising that depending on the solutions agreed with the business owner, there is potential for the impact magnitude to be reduced through an acceptable relocation/alternative location for the business.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Commercial / industrial premises - Blaisdon Way commercial premises	Temporary disruptions to access due to construction works and traffic management	High	Minor adverse	Slight adverse (not significant) Temporary and reversible
	Summary of effects assessment	The businesses at this receptor may experience temporary disruptions to access as a consequence of construction works on the A4019 and associated traffic management arrangements to maintain through flow of traffic, including buses, but under constrained carriageway widths, particularly from the west. Traffic management arrangements will also affect access routes to the A4019 during the construction phase, including the B4634 – this provides a route to Blaisdon Way from the north, although other local routes are available outside Order limits. The movements of WCH are also accommodated within the traffic management, including specific reference to the need to accommodate safe and convenient movement for mobility impaired through areas under traffic management. The Link Road will form a junction with the B4634 – when these connection works are undertaken, there will be disruption to traffic flow along the B4634, which could disrupt access along this route from the south. There are alternative access routes available for the southern receptors; and traffic management is intended to ensure traffic can continue to use the A4019 and B4634 during construction. Embedded mitigation includes targeted community engagement to provide advance notice of works activities to allow forward planning of journeys to be effective. Construction signage strategies are to include directional markers for businesses. The magnitude of impact would be minor adverse. DMRB LA104 allows for the selection of slight or moderate adverse effects for this combination of sensitivity and impact magnitude. These disruptions to access will be temporary and reversible and do not affect all routes nor the expected catchment for the receptor. The assessment concludes a **slight adverse effect** which is not significant.		
		Embedded mitigation: Refer to mitigation ref. PHH4, PHH9, PHH12 and G10 in Table 13-19. **Essential mitigation:** No specific additional mitigation measures are proposed.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
	Residual effects assessment (effect + essential mitigation)	No additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **slight adverse**, which is not significant.		

Table 13-16 – Residual effects of operational activities on development land and business

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Commercial / industrial premises - >5ha of proposed employment – Policies A4 (23ha.) and A7 (45ha.)	Strategic access improvements across a range of modes and to strategic development land	Very high	Moderate Beneficial	Large beneficial (significant)
	Summary of effects assessment	For the strategic undeveloped areas that include employment development (North West Cheltenham Development Area; West Cheltenham Development Area and safeguarded land to the north-west of Cheltenham), the Scheme (see General Arrangements Plans (application document TR010063/APP/2.9)) will deliver access into the land parcels. This will deliver transport improvements that are a policy requirement in the JCS to catalyse their development. This will deliver a moderate magnitude of impact in terms of enabling development. DMRB LA104 allows for the identification of large or very large effects based on this combination of sensitivity and impact magnitude. On the basis that the Scheme is a catalyst providing primary access points and multi-modal access, but that subsequent proposals will be required to realise the full connectivity into and across these sites, the resultant effect is assessed as **large beneficial and significant**.		
		Embedded mitigation: Refer to mitigation ref. PHH17, SD1, SD2, SD3 and SD5 in Table 13-19 **Essential mitigation:** No specific additional mitigation measures are proposed.		
	Residual effects assessment (effect + essential mitigation)	No additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **large beneficial and significant**.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Commercial / industrial premises - Gloucester Old Spot public house - Stanboro Cottage Fish Farm - Comfy Campers - Cheltenham Auto Services - Distinctive Ironwork blacksmith - The House in the Tree public house - Holmedale Guest House - Elmstone Business Park - Arle Nursery - Cheltenham Fencing	Strategic access improvements across a range of modes	Medium	Moderate beneficial	Moderate beneficial (significant)
	Summary of effects assessment	Access for these receptors will be improved through the implementation of the Scheme (see General Arrangements Plans (application document TR010063/APP/2.9)). In general terms, improvements relate to the increased capacity of the road network, reduced congestion, and increased journey time reliability, coupled with enhancement to walking and cycling access and movement through the study area and between these receptors and other destinations. The M5 Junction 10 will become an all movement junction, increasing the potential accessibility to business catchments along the strategic road network and increasing passing trade, which may be of particular benefit to premises fronting the A4019. The Link Road will improve accessibility to businesses fronting the B4634. Walking and cycling connectivity will also be enhanced with access to the continuous shared use path alongside the northern carriageway of the A4019, which includes crossing phases within major junctions. The Link Road will also incorporate improved walking and cycling accessibility. Taken together, these aspects of the Scheme will deliver a moderate beneficial magnitude of impact. The resultant effect is assessed as being **moderate beneficial and significant**.		
		Embedded mitigation: Refer to mitigation ref. PHH17, SD1, SD2 (1-3) and SD3 (relevant bus stops include Stanboro Lane, Withy ~~b~~Bridge and Cooks Lane) in Table 13-19. **Essential mitigation:** No specific additional mitigation measures are proposed.		
	Residual effects assessment (effect + essential mitigation)	No additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **moderate beneficial and significant**.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude	Effect (Scheme + embedded mitigation)
Commercial / industrial premises - Gateway Retail Park - Applegreen filling station, car and motorcycle dealership and restaurant - Premier Inn Cheltenham North West and associated restaurants	Strategic access improvements across a range of modes	Medium	Moderate beneficial	Moderate beneficial (significant)
	Summary of effects assessment	Access for these receptors will be improved through the implementation of the Scheme (see General Arrangements Plans (application document TR010063/APP/2.9)). In general terms, improvements relate to the increased capacity of the road network, reduced congestion, and increased journey time reliability, coupled with enhancement to walking and cycling access and movement through the study area and between these receptors and other destinations. The M5 Junction 10 will become an all movement junction, increasing the potential accessibility to business catchments along the strategic road network and increasing passing trade. Walking and cycling connectivity will also be enhanced with access to the continuous shared use path alongside the northern carriageway of the A4019, which includes crossing phases within major junctions. The Link Road will also incorporate improved walking and cycling accessibility. The Scheme will deliver a moderate beneficial magnitude of impact. The resultant effect is assessed as being **moderate beneficial and significant**.		
		Embedded mitigation: Refer to mitigation ref. SD2 (2) and SD3 (relevant bus stops include Stanboro Lane, Withy ~~b~~Bridge and Cooks Lane) in Table 13-19. **Essential mitigation:** No specific additional mitigation measures are proposed.		
	Residual effects assessment (effect + essential mitigation)	No additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **moderate beneficial and significant**.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Commercial / industrial premises - Businesses at Gallagher Retail Park - Businesses at Kingsditch Trading Estate	Strategic access improvements across a range of modes	Very high	Moderate beneficial	Larege beneficial (significant)
	Summary of effects assessment	Access for these receptors will be improved through the implementation of the Scheme (see General Arrangements Plans (application document TR010063/APP/2.9)). In general terms, improvements relate to the increased capacity of the road network, reduced congestion, and increased journey time reliability, coupled with enhancement to walking and cycling access and movement through the study area and between these receptors and other destinations. The M5 Junction 10 will become an all movement junction, increasing the potential accessibility to business catchments along the strategic road network and increasing passing trade. The junction providing access to Gallagher Retail Park from the A4019 will be signalised which should benefit access/egress for all users and staff by improving journey time reliability and safety of crossing movements for motorists. Walking and cycling connectivity will also be enhanced with access to the continuous shared use path alongside the northern carriageway of the A4019, which includes crossing phases within major junctions. The Link Road will provide increased capacity for vehicles to access destinations to the south of M5 Junction 10, including Boddington and will connect to the A4019 via a signalised junction at Gallagher Retail Park. Taken together, these aspects of the Scheme will deliver a moderate beneficial magnitude of impact. DMRB LA104 allows the resultant effect to be assessed as large or very large beneficial based on this combination of sensitivity and impact magnitude. On the basis that the sites are already established and benefit from good levels of accessibility, the resultant effect is assessed as **large beneficial, which is significant**.		
		Embedded mitigation: Refer to mitigation ref. SD2 (2) and SD3 (relevant bus stops include Stanboro Lane, Withy bBridge and Cooks Lane) in Table 13-19. **Essential mitigation:** No specific additional mitigation measures are proposed.		
	Residual effects assessment (effect + essential mitigation)	No additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **large beneficial and significant**.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude	Effect (Scheme + embedded mitigation)
Commercial / industrial premises - Aldi, car dealership and service centre and private gym, west of A4019 and B4634 junction - Blaisdon Way commercial premises - Bailey's nursery (retail aspect)	Strategic access improvements across a range of modes	High	Moderate beneficial	Moderate beneficial (significant)
	Summary of effects assessment	Access for the businesses at these receptors will be improved through the implementation of the Scheme (see General Arrangements Plans (application document TR010063/APP/2.9)). In general terms, improvements relate to the increased capacity of the road network, reduced congestion, and increased journey time reliability, coupled with enhancement to walking and cycling access and movement through the study area and between these receptors and other destinations. The M5 Junction 10 will become an all movement junction, increasing the potential accessibility to business catchments along the strategic road network and potentially increasing passing trade. The A4019/B4634 junction will be signalised which should benefit ease of turning movement and reduce queuing, therefore improving journey time reliability. Walking and cycling connectivity will also be enhanced with access to the continuous shared use path alongside the northern carriageway of the A4019 and along the B4634, which includes crossing phases within major junctions. The Link Road will provide increased capacity for vehicles to access destinations towards the south of M5 Junction 10, which will pass northern access routes to some of the receptors. Taken together, these aspects of the Scheme will deliver a moderate beneficial magnitude of impact. DMRB LA104 allows the resultant effect to be assessed as moderate or large beneficial based on this combination of sensitivity and impact magnitude. On the basis that the receptors are already established and benefit from good levels of accessibility, including from a catchment that is outside Order limits, the resultant effect is assessed as **moderate beneficial,** which is significant.		
		Embedded mitigation: Refer to mitigation ref. SD2 (2), SD3 (relevant bus stops include Stanboro Lane, Withy ~~b~~B ridge and Cooks Lane) and SD5 in Table 13-19. **Essential mitigation:** No specific additional mitigation measures are proposed.		
	Residual effects assessment (effect +	No additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **moderate beneficial and significant**.		

	essential mitigation)			
Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Commercial / industrial premises - Planning application 20/00213/FUL: Manor Farm (3 units) - Planning application 20/02132/FUL: Warners of Cheltenham (12 units) - Planning application 21/02120/FUL: Gallagher Retail Park (1 unit)	Strategic access improvements across a range of modes	Low	Minor beneficial	Slight beneficial (not significant)
	Summary of effects assessment	Access to these future commercial business locations will be improved through the implementation of the Scheme (see General Arrangements Plans (application document TR010063/APP/2.9)). In general terms, improvements relate to the increased capacity of the road network, reduced congestion, and increased journey time reliability, coupled with enhancement to walking and cycling access and movement through the study area and between these receptors and other destinations. This will result in a minor beneficial impact, noting that the proposed receptors are not yet implemented, and the Scheme is not considered to be fundamental to their implementation. DMRB LA104 allows for the selection of neutral or slight beneficial effects based on this combination of sensitivity and impact magnitude. Due to the Scheme increasing capacity on the road network which will benefit the proposed receptors, the resultant effect is assessed as **slight beneficial** and not significant.		
		Embedded mitigation: Refer to mitigation ref. SD2 (1-3) and SD3 (relevant bus stops include Stanboro Lane, Withy ~~b~~Bridge and Cooks Lane) in Table 13-19. **Essential mitigation:** No specific additional mitigation measures are proposed.		
	Residual effects assessment (effect + essential mitigation)	No additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **slight beneficial** and not significant.		

Agricultural land holdings

13.9.18. The assessment of the level of impacts and resultant effects on individual agricultural land holdings is summarised in Table 13-17. This relates to consideration of the Scheme and embedded mitigation (see Section 13.10) and draws on information provided in Chapter 10 – Geology and Soils (application document TR010063/APP/6.8).

13.9.19. The impacts on agricultural land holdings occur in the construction phase and, for the purposes of the Population assessment, are reported in this phase of the Scheme only.

13.9.20. No essential mitigation has been identified for any agricultural land holdings. This means that all residual assessments are unchanged from the main assessment findings. Where a significant adverse residual effect is noted, this is a matter for compensation that falls outside the scope of this ES.

Table 13-17 – Residual effects relating to agricultural land holdings

Holding	Size and land use	Sensitivity	Land take and severance	Impact without mitigation	Environmental mitigation	Impact with mitigation	Residual adverse effect
Holding A	52.6 ha Grazing and arable	Medium	Permanent loss of up to 2 ha to M5 widening and attenuation pond. Access from A4019 will be retained Some temporary land-take.	Minor	None possible for permanent land-take. Restoration of temporarily acquired land to its original condition	Minor	Slight (not significant)
Holding B	65 ha mainly arable farm with some grazing. Woodland in Farm Woodland Scheme	Medium	20 ha required for flood storage and highway widening. Loss of Farm Woodland Scheme payments.	Major due to loss of land quality within flood storage area (FSA)	None possible for the flood storage area	Moderate	Moderate/ large[22] (significant)
Holding C	19.6 ha of grass	Medium	Permanent loss of up to 3.7 ha to link road and attenuation pond Severance of two fields. Some temporary land-take.	Moderate	None possible for permanent land-take Provide recessed gateways and handling pens in severed fields. Restoration of temporarily acquired land to its original condition	Moderate	Moderate (significant)

[22] The population assessment draws on the findings of the agricultural assessment. The methodology for the latter allows for mixed categories to be identified. For the population assessment reporting, the worst case category is reported.

Holding	Size and land use	Sensitivity	Land take and severance	Impact without mitigation	Environmental mitigation	Impact with mitigation	Residual adverse effect
Holding D	10 ha of arable and grass	Medium	Permanent loss of up to 1.7. ha. Alternative access to be provided from A4019. Some temporary land-take.	Minor	None possible for permanent land-take. Restoration of temporarily acquired land to its original condition	Minor	Slight (not significant)
Holding E	70 ha Arable farm	Medium	Permanent loss of up to 1 ha. Some temporary land-take.	Minor	None possible for permanent land-take. Restoration of temporarily acquired land to its original condition	Minor	Slight (not significant)
Holding F	21 ha of arable and grass	Medium	Permanent loss of up to 1.7 ha to link road. Some temporary land-take.	Moderate	None possible for permanent land-take. Provide recessed gateways and handling pens in severed fields. Restoration of temporarily acquired land to its original condition	Moderate	Moderate (significant)
Holding G	46 ha of arable	Medium	Alternative access to be provided from A4019, so access unaffected. Permanent loss of up to 2.0 ha to road widening and junction. Some temporary land-take.	Minor	None possible for permanent land-take. Restoration of temporarily acquired land to its original condition.	Minor	Slight (not significant)

Holding	Size and land use	Sensitivity	Land take and severance	Impact without mitigation	Environmental mitigation	Impact with mitigation	Residual adverse effect
Holding H	49 ha of grazing	Medium	Permanent loss of up to 9.0 ha to link road and attenuation ponds. Severance of two fields Loss of barn. 1.4 ha required for flood compensation area Some temporary land-take.	Moderate due to land-take and loss of land quality on compensatory floodplain.	None possible for land-take Provide recessed gateways and handling pens in severed fields. Alternative access to be provided from A4019 next to fire station. Restoration of temporarily acquired land to its original condition	Moderate	Moderate (significant)
Holding I	12 ha of arable	Medium	Permanent loss of up to 2.5 ha including loss of use of 0.3 ha west of link road. Severance of two fields. Some temporary land take.	Moderate	None possible for permanent land-take. Provide recessed gateways and handling pens in severed fields. Restoration of temporarily acquired land to its original condition	Moderate	Moderate (significant)
Holding J	In excess of 300 ha. Mainly arable	Medium	Permanent loss of up to 3 ha to M5 widening and attenuation pond. Alternative access provided from A4019 east of M5. Some temporary land-take.	Minor	None possible for permanent land-take. Restoration of temporarily acquired land to its original condition	Minor	Slight (not significant)

Holding	Size and land use	Sensitivity	Land take and severance	Impact without mitigation	Environmental mitigation	Impact with mitigation	Residual adverse effect
Holding K	41 ha of arable and grass	Medium	Permanent loss of around 0.3 ha. Some temporary land-take.	Negligible	None possible for permanent land-take. Restoration of temporarily acquired land to its original condition.	Negligible	Slight (not significant)
Holding L	4.25 ha of arable and grass	Medium	Permanent loss of 0.25 ha to attenuation pond.	Minor	None possible for permanent land-take.	Minor	Slight (not significant)

Walkers, Cyclists and Horse Riders (WCH)

Construction

13.9.21. The assessment of the level of construction impact and resultant effects is detailed in Table 13-18. This relates to consideration of the Scheme and embedded mitigation (see Section 13.10).

13.9.22. Where necessary, essential mitigation is noted, contributing to an overall residual effects assessment score.

13.9.23. The standard in DMRB LA 112 on the magnitude of impact on WCH routes focuses exclusively upon impacts to changes to journey length. There are several WCH routes that intersect with the Order limits or are within 250m of the Order limits that are not anticipated to change. On this basis, in terms of the population assessment methodology these WCH routes will not experience impacts from the Scheme. They are listed in Table 13-10, but are not included within the assessment at Table 13-18.

13.9.24. There are no WCH routes within 500m of the Order limits that will experience impacts from the Scheme in relation to the scope of the population methodology. These are also listed within the baseline at Table 13-10, but are not included in the assessment.

Table 13-18 – Residual effects of construction on walkers, cyclists and horse riders

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
WCH routes intersecting Order limits and B4634 (i.e. in permanent footprint for the Scheme), including Boddington Footpath 16– ABO16 Boddington Footpath 14– ABO14 Boddington Footpath 24 – ABO24 Uckington Footpath 11 – AUC11 Uckington Footpath 8 – AUC8 Boddington Footpath 26 – ABO26	Potential impacts to Boddington Footpath 16 – ABO16 include Short-term closure of ABO16 part 2 and ABO16 part 3 during the works proposed on the River Chelt culvert. As works are minor (landscaping, bat/otter mitigation, embankment formation), the contractor could retain public access to the tunnel under the M5 Junction 10 otherwise the temporary diversion route will be more than 500m. A precautionary approach has been adopted that assumes that the diversion may be >500m.	High	Major	Large adverse (significant) Temporary, direct, and indirect and reversible
	Potential impacts to Boddington Footpath 14 – ABO14 include Short-term closure of ABO14 part 1 during the construction of the M5 Junction 10 The temporary diversion route will use ABO13 to access the A4019/Stoke Lane Junction, which will result in a more than 500m increase in journey length. Combination of sensitivity and impact magnitude allows for moderate or large effects – the assessment concludes	Medium	Major	Moderate adverse (significant) Temporary, direct, and indirect and reversible

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
	moderate recognising the short term duration and intention to use an extant route for the diversion.			
	Potential impacts to Boddington Footpath 24 – ABO24 include Short-term closure during the construction of the Link Road. The temporary diversion route will be to the south along the B4634 and Withybridge Lane, which will result in a more than 500m increase in journey length. The route will then be replaced with a section of permanent realignment. Combination of sensitivity and impact magnitude allows for large or very large effects – the assessment concludes large, recognising the short term duration of the closure and intention to replace with an enhanced asset.	High	Major	Large adverse (significant) Temporary, direct, and indirect and reversible (through permanent re-routing)
	Potential impacts to Uckington Footpath 11 – AUC11 include Short term closure during the construction of the Link Road The temporary diversion route will be to the north along the A4019 and then Withybridge Lane which will result in a more than 500m increase in journey length. Combination of sensitivity and impact magnitude allows for large or very large effects – the assessment concludes large, recognising the short term duration of the closure and intention to replace with an enhanced asset through connection to the Withybridge underpass.	High	Major	Large adverse (significant) Temporary, direct, and indirect and reversible

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
	Potential impacts to Uckington Footpath 8 – AUC8 Short-term closure during the construction of the A4019 widening to the east of Uckington. The temporary diversion route will be to the south, along The Green road into Uckington and then east along the A4019, which will result in a more than 500m increase in journey length.	Medium	Major	Moderate adverse (significant) Temporary, direct, and indirect and reversible
	Potential impacts to Boddington Footpath 26 – ABO26 include Short-term closure during the construction of the Link Road and B4634 junction. The assumed temporary diversion route will follow Hayden Road to access Withybridge Lane, which will result in a more than 100m increase in journey length. Combination of sensitivity and impact magnitude allows for slight or moderate effects – the assessment concludes slight, recognising the short term duration of the closure and intention to replace with an enhanced asset.	High	Minor	Slight adverse (not significant) Temporary, direct, and indirect and reversible
	Summary of effects assessment	These WCH routes fall within the Order limits within the permanent footprint of the Scheme. They have been identified as requiring temporary closure during the works prior to implementation of permanent diversions, resulting in disruptions to access, pedestrian or cyclist delays and increases in journey length and/or time. For WCH route ABO16, should a diversion be required, the magnitude of impact from disruption would be major adverse. DMRB LA 104 allows for the selection of large or very large adverse for the effects. Although journey distances will increase, the impact on the WCH routes will be temporary in duration and embedded mitigation includes temporary diversions, therefore the assessment concludes a **large adverse effect** which is significant.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
		For WCH routes ABO24 and AUC11, the magnitude of impact for disruption would be major adverse. DMRB LA 104 allows for the selection of large or very large adverse for the effects. Although journey distances will increase, the impact on the WCH routes will be temporary in duration and embedded mitigation includes temporary diversions, therefore the assessment concludes a **large adverse effect** which is significant. For WCH route AUC8 and ABO14, the magnitude of impact for disruption would be major adverse. DMRB LA 104 allows for the selection of moderate or large adverse for the effects. Although journey distances will increase, the impact on the WCH route will be temporary in in duration and embedded mitigation includes a temporary diversion, therefore the assessment concludes a **moderate adverse effect** which is significant. For WCH route ABO26, the magnitude of impact for disruption would be minor adverse. DMRB LA104 allows for the selection of slight or moderate adverse for the effects. Although journey distances will increase, the impact on the WCH route will be temporary in in duration and embedded mitigation includes a temporary diversion, therefore the assessment concludes a **slight adverse effect** which is not significant.		
		Embedded mitigation: Refer to mitigation ref. PHH15, PHH18 in Table 13-18. **Essential mitigation:** Temporary signalised crossing facilities should be provided along key WCH desire lines (including on the A4019 at Uckington) during the construction phase, as part of the temporary construction plan (refer to mitigation ref. PHH5). No diversion route should exceed 250m overall additional length over the route that it is replacing (refer to mitigation ref. PHH5).		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
		Existing crossings and routes only to be diverted or closed once alternative routes are in place (refer to mitigation ref. PHH5).		
	Residual effects assessment (effect + essential mitigation)	The residual effects assessment for WCH routes ABO16, ABO24 and AUC11 is **large adverse**, which is significant. This is a precautionary assessment – it is noted that essential mitigation PHH5 should ensure that the magnitude of these impacts is reduced through shorter diversions; however, this cannot be certain until such time as the PC has developed the proposals. The residual effects assessment for WCH routes AUC8 and ABO14 takes account of essential mitigation but remains **moderate adverse**, which is significant. This is a precautionary assessment – it is noted that essential mitigation PHH5 should ensure that the magnitude of these impacts is reduced through shorter diversions; however, this cannot be certain until such time as the PC has developed the proposals. The residual effects assessment for WCH route ABO26 takes account of essential mitigation and is unchanged from the main assessment, as **slight adverse**, which is not significant.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Uckington Bridleway 1-AUC1 (partly within the Order limits)	Long-term closure of AUC1 for the duration of the construction period. A diversion route has not been identified.	High	Major	Very large adverse (significant) Temporary, direct and indirect and reversible
	Summary of effects assessment	Bridleway ref. AUC1 falls within the Order limits, within the temporary and permanent footprint of the Scheme. The Bridleway will be temporarily stopped to the north of the A4019. This has been discussed through consultation leading to the rationale that it would be unsafe to bring horses through a construction working area / close to a construction compound. The closure will result in long-term disruptions to access and increases in journey length and/or time. As a suitable diversion route has not been identified, the magnitude of impact for disruption would be major adverse with the assumption that an alternative route would result in an increase in the journey length to be greater than 500m. DMRB LA 104 allows for the selection of large or very large adverse for the effects. Whilst the impact will be temporary in duration the Bridleway will be closed for the full duration of construction with no known diversion route, therefore the assessment concludes a **very large adverse effect** which is significant.		
		Embedded mitigation: Refer to mitigation ref. PHH5 in Table 13-18. **Essential mitigation:** The contractor should seek to minimise the duration and length of WCH diversions ideally to a maximum diversion distance of 250 m (refer to mitigation ref. PHH5).		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
		Existing crossings and routes only to be diverted or closed once alternative routes are in place (refer to mitigation ref. PHH5).		
	Residual effects assessment (effect + essential mitigation)	The residual effects assessment, taking account of the essential mitigation, remains **very large adverse,** which is significant. This is a precautionary assessment – it is noted that essential mitigation PHH5 should ensure that the magnitude of these impacts is reduced through suitable and shorter diversions; however, this cannot be certain until such time as the PC has developed the proposals.		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
Cheltenham Circular Path (within the Order limits) Includes WCH routes AUC8, AUC14 and, ABO25 and ZCH5; and crosses the A4019	Long-term closure of the A4019 and short-term closure of AUC8, during the construction of the A4019 widening to the east of Uckington. There may be disruptions to journey length.	High	Moderate	Large (significant) Temporary, direct, and indirect and reversible
	Summary of effects assessment	The Cheltenham Circular Path crosses the A4019 to connect Moat Lane and Footpath ref. AU8. The crossing area falls within the Order limits, and permanent footprint of the Scheme. Currently, there is no formal crossing over the A4019 at this point and the ability for pedestrians to cross the A4019 will be maintained during construction. The existing PRoW forming part of the Cheltenham Circular Path, which connect to Moat Lane, will not be affected by the Scheme in terms of journey length. Footpath ref. AUC8 falls within the Order limits within the temporary footprint of the Scheme and a temporary diversion route will be available. Based on the sensitivity of the Cheltenham Circular Path, should the diversion route to cross the A4019 exceed 250m there will be a moderate or large significant adverse effect (based on the combination of sensitivity and impact magnitude with reference to DMRB LA104). However, as the AUC8 will also be diverted for a short period of time the assessment concludes a **large adverse effect** on the Cheltenham Circular Route **which is significant.**		
		Embedded mitigation: Refer to mitigation ref. PHH5, PHH15, PHH18 in Table 13-18. **Essential mitigation:** The contractor should seek to minimise the duration and length of WCH diversions ideally to a maximum diversion distance of 250 m (refer to mitigation ref. PHH5).		

Receptors	Impacts	Sensitivity of Land Use Receptor	Impact Magnitude (including embedded mitigation)	Effect (Scheme + embedded mitigation)
		Existing crossings and routes only to be diverted or closed once alternative routes are in place (refer to mitigation ref. PHH5).		
	Residual effects assessment (effect + essential mitigation)	The residual effects assessment, taking account of the essential mitigation, remains **large adverse,** which is significant. This is a precautionary assessment – it is noted that essential mitigation PHH5 should ensure that the magnitude of these impacts is reduced through suitable and shorter diversions; however, this cannot be certain until such time as the PC has developed the proposals.		

Operation

13.9.25. The effects on WCH noted within the population assessment relate to the construction phase. It is considered that the embedded mitigation within the Scheme (as reported in Table 13-18) and the design process has served to ensure that adverse effects arising during construction do not endure into the operational phase. On this basis, there is no WCH operational assessment for the population assessment.

13.9.26. As noted in the methodology and reiterated in this sub-section, the DMRB methodology for assessing the population effects of impacts to WCH is focused exclusively on journey length. Notwithstanding this, the Scheme design (see General Arrangements Plans (application document TR010063/APP/2.9)) introduces a number of additional WCH assets, which will be available for use in the operational phase. With these additional assets, the facilities available for use by WCH will be enhanced and have greater connectivity. This beneficial effect is outside the scope of the population assessment; however, it is reported in the Human Health assessment.

13.9.27. The additional WCH assets are as follows (refer also to SD2 in Table 13-19):

- Separate pedestrian and cycle crossings have been included where possible. The Scheme will include a segregated cycleway (4m width) and footway (2m width) on the northern side of the A4019, which with the exception of a short section of shared use path through Uckington will extend from the junction of the A4019 with Stanboro Lane in the west through to the Gallagher junction at the eastern end of the Scheme. This active travel corridor will provide connectivity for pedestrians and cyclists between north-west Cheltenham and the junction of the A4019 and Stanboro Lane (west of M5 Junction 10). It will tie into an existing shared use path at the eastern end of the Scheme, and an existing footway at the western end. The layout and design of these facilities for pedestrians and cyclists is shown in the General Arrangements Plans (application document TR010063/APP/2.9).
- The Link Road has a segregated cycleway (4m in width) and footway (2m in width) all the way along its west side. To the west of the junction, the Scheme will provide a parallel cycle and pedestrian crossing of the B4634, incorporated into the signalised junction, to allow the future continuation of the proposed cycling and pedestrian route into the West Cheltenham Development Area (allocated in Policy A7 of the JCS).
- The B4634 will be widened to the south of its existing alignment to allow for the provision of a 2m wide shared use path along the northern verge through to the junction of the B4634 and Withybridge Lane. This will provide a connection between the walking and cycling provision on the Link Road and Withybridge Lane.
- WCH underpass beneath the A4019, just to the east of the M5 Junction 10. This will connect bridleway AUC1 (Uckington 1) via a new section of bridleway and footpath to the existing recreational network to the south of the A4019.
- The inclusion of an equestrian phase and push button at the Uckington Junction linking bridleway AUC14 (Uckington 14) to The Green in the north.
- Signalised WCH crossing points within all new junctions on the A4019, where possible pedestrian crossings will be puffin crossings. There is not sufficient space for separate crossings across the A4019 at the Site Access A junction (opposite Homecroft Drive) and on the southern and eastern arms of the Gallagher junction. At these three locations the crossings will be toucan crossings.
- Cooks Lane bus stops are to be re-located closer to Uckington and the proposed signalised crossing facilities. The eastbound and westbound stops are located as in lane stops just to the east of the junction of The Green and the A4019 in Uckington. Pedestrian access is provided to both from the signalised junction in Uckington.

13.10. Mitigation measures – Population

13.10.1. The assessment summary tables and supporting narrative provided in the previous sub-section includes the Scheme design, embedded and essential mitigation measures that are considered relevant to each set of impacts. These represent means of avoiding adverse effects through good design, delivering mitigation of adverse effects, and incorporating enhancement measures into the Scheme design, and the management of construction of the Scheme.

13.10.2. The full list of mitigation is provided in the REAC (application document TR0100063 APP 7.4). Table 13-19 lists the relevant embedded and essential mitigation measures, extracted from the REAC (application document TR0100063 APP 7.4). This is then followed by summaries of the aspects of the Scheme design that have been particularly influential in conducting the population assessment – these are prefixed 'Scheme design (SD)' and further information about them is contained within Chapter 2 (TR010063/APP/6.2), which cross-referenced to the Works Numbers that are contained within the Works Plans for the Scheme (TR010063/APP/2.4).

Table 13-19 – Embedded and essential mitigation measures: an extract from the REAC; and Scheme design relevant to population assessment

Ref	Objective of the commitment	Description of the mitigation measure or commitment
G1	Production of an Environmental Management Plan (EMP)	*PARTIAL EXTRACT:* Preparation of an EMP. The PC to prepare an EMP for their works prior to the commencement of the DCO and which details the measures that shall be undertaken prior to, and during construction of, the Scheme. The construction of the authorised development must be carried out in accordance with the approved EMP. No part of the authorised development is to commence until an EMP (2nd iteration), substantially in accordance with the EMP (1st iteration), for that part has been submitted to and approved in writing by the Secretary of State, following consultation with the relevant planning authority to the extent that it relates to matters relevant to its functions. The EMP (2nd iteration) must be written in accordance with ISO14001 and so far, as is relevant to that part of the authorised development, must reflect the mitigation measures set out in this REAC. An EMP (3rd iteration) must be developed and completed by the end of the construction, commissioning, and handover stage of the authorised development, in accordance with the process set out in the approved EMP. The authorised development must be operated and maintained in accordance with the EMP (3rd iteration).
G2	An effective EMP	Environmental management system. The PC shall have an Environmental Management System (EMS) certified to BS EN ISO 14001. The PC's EMS will define appropriate control measures and monitoring systems to be employed during the planning and construction of the works for all relevant topic areas. The PC's EMS shall cover the activities of all their sub-contractors. The PC will also be required to coordinate with other contractors and relevant parties that may affect

Ref	Objective of the commitment	Description of the mitigation measure or commitment
		their works. This will be documented in their EMS, as appropriate. As part of their EMS, the PC shall commit to planning works in advance to ensure that, in so far as is reasonably practicable, measures to reduce environmental effects are integrated into the construction methods.
G3	An effective EMP	Environmental policy. The PC shall develop a Scheme specific environmental policy, prior to the EMS, and to be included as part of the EMS. This policy will be developed in line with environmental policies of GCC and the Scheme objectives and will set out how the PC will: • Adhere to the requirements of environmental legislation during the works. • Commit to mitigating the impacts associated with the works. • Commit to good practice in environmental performance throughout the phase of works. • Identify opportunities to improve the Scheme's whole life performance in terms of environmental and social implications.
G4	Management Plans	Management plans. The PC shall prepare Management Plans for certain environmental topic areas as the detailed design is developed, to include as a minimum the plans listed in Annex B of the EMP (1st iteration) (application document TR010063/APP/7.3). These plans will be appended to the EMP as appropriate. The plans shall be prepared in consultation with the relevant regulatory organisation, relevant planning authority and national Highways and submitted to and approved in writing by the Project GCC.
G10	Effective Traffic Management	Traffic management will be implemented by the PC to maintain traffic flows during the construction of Junction 10, the Link Road and the widened A4019. This will include local service roads linked to the signalised junctions to enable local residents to retain an ease of access onto the A4019, particularly for turning right (onto the A4019). A minimum of one eastbound (E/B) and one westbound (W/B) traffic lane will typically be maintained on the A4019 throughout the construction period. Exceptions may be required for essential overnight lane closures where single lane working under traffic control may need to be deployed; and in instances where stakeholder engagement through the Public Liaison Officer (see PHH9) proposes alternative traffic management arrangements that are assessed as having Scheme benefits during construction and approved in writing by GCC as an acceptable alteration to the Traffic Management Plan. The movements of construction traffic (including the journeys for construction staff to and from the Scheme)

Ref	Objective of the commitment	Description of the mitigation measure or commitment
		will also be managed through this Traffic Management Plan to avoid adverse environmental impacts on the local road network. Construction vehicles will be managed by: • Preferred routes to access each area of the site and from each major source of materials. • Preferred routes during road diversions. • Management measures for construction worker traffic. The Traffic Management Plan will include temporary diversion routes for all vehicles when sections of the existing highway network must be closed. These diversions will prioritise routing via A-roads. Signage will be implemented to discourage the use of the local road network by HDVs (Heavy Duty Vehicles), except where access is required.
G11	Working hours	Unless otherwise notified (and agreed in writing with the LPA), construction works will take place during normal work hours 07:00 - 19:00 weekdays and Saturdays. Construction works outside of these hours shall be minimised as far as possible. Where possible, advance notice of construction works outside of these hours will be given through the Community Engagement process.
G12	Protection and maintenance of the Sheldon Cottages and gardens during the construction stage	The residents of the two properties at Sheldon Cottages (located on Stanboro Lane) will relocate to other accommodation during the construction phase. The cottages will be re-occupied on completion of construction by the existing residents (pre-construction), or new residents. Whilst Sheldon Cottages and gardens are within the Order limits the cottages and gardens will be protected and maintained during the construction period so that they can be re-occupied on completion of construction.
B6	Minimise loss of vegetation and avoid damage to existing vegetation (see also LV1 and LV2 below) to retain existing biodiversity resource as far as possible	Removal of minimal extent of vegetation necessary for the works. In particular, within areas of land temporarily required for topsoil storage or compounds, boundary features such as hedgerows will be retained. The design has ensured retention of three key areas, as follows: • An area of lowland meadow priority habitat immediately north of Stanboro Lane will be retained. • Embankments on the M5 at the point where the River Chelt passes under the motorway have been designed so that the existing culvert does not require extending on either side of the motorway. Consequently, there will be no direct loss of river habitat or alterations to channel bed and banks in this location. • River Chelt bridge will be a clear span structure with set-back abutments (approximately 4 m from the watercourse margin), thereby avoiding direct impacts to the in-channel and bank top habitats, ensuring fauna can continue to move along the watercourse unimpeded.

Ref	Objective of the commitment	Description of the mitigation measure or commitment
		Any retained vegetation will be clearly demarcated with no allowance of vehicles or storage of materials within these areas. The root zones and canopies of trees and areas of woodland to be retained will be protected during construction. Protection of retained vegetation (trees and hedges) in accordance with the Arboricultural Impact Assessment (AIA) to avoid detrimental damage. Detailed design to review opportunities for further reducing habitat loss.
B7	Habitat creation and management (terrestrial) to compensate for unavoidable habitat loss and provide enhancements	An area of farmland to the southeast of Junction 10 will be transformed into an area supporting wetland habitats, scrub, woodland, and species-rich grassland, whilst also fulfilling its role as the flood storage area. The embankments along the Link Road will be planted with blocks of woodland and hedgerows with trees. The A4019 planting comprises hedgerows and trees to the north and south, as well as trees within the central reserve and areas of species rich grassland. The focus of the planting around the junction itself and along the motorway is blocks of woodland and linear belts of trees and shrubs, along with areas of species rich grassland. Attenuation basins and ditches will be sown with wet grassland and marginal planting. Where in National Highway (NH) jurisdiction, planting is to be in accordance with NH requirements (NB. liaison with NH to be undertaken during detailed design to agree plant species in NH jurisdiction). Where in GCC jurisdiction, planting will be in accordance with GCC Highways and Biodiversity Guidance for Gloucestershire May 2022 – to be undertaken at detailed design. Species rich grass areas will have low nutrient/minimal topsoil, to promote wildflower growth. Habitat creation will occur in suitable planting seasons as early as possible throughout the construction programme to reduce the time lag between habitat loss and habitat planting and establishment. Natural refugia comprising log piles will be created for small mammals, reptiles and amphibians using cleared vegetation. Unwanted logs from vegetation clearance and stones from ground works will be used to create piles close to newly created ponds. Split logs, dead wood, rocks, and bricks, loosely filled with topsoil on gentle slope provide a good refuge and hibernaculum for great crested newts. Careful consideration of placement and design to maximise use and prevent possible flooding, drying out and aesthetic complaints from the public will be necessary. These details will be addressed as part of the detailed design.
LV1	Avoid damage to existing vegetation	Protection of retained vegetation (trees and hedges) in accordance with the AIA to avoid detrimental damage.
LV2	Minimise loss of vegetation	Removal of minimal extent of vegetation necessary for the works. Detail design to look to further reduce loss.

Ref	Objective of the commitment	Description of the mitigation measure or commitment
LV3	Reinstatement of lost vegetation providing a specific screening or amenity function	Replacement of woodland, scrub, hedges, trees and grass land and new suitable planting to new features, including wetland areas, link road and central reserves, to integrate Scheme into the landscape, reinstate screening effect and replace lost habitats wherever possible. Evergreen native/non-invasive species to be included where screening is a function.
LV6	Design of the noise barriers	Consult with LPA and directly affected receptors on options for the final design of noise barriers so that they provide visual amenity and/or biodiversity values as well as noise abatement.
LV8	Early planting of new vegetation	Consider early planting where this is identified for visual mitigation requirements where feasible within programme to allow planting to establish and the integration of the Scheme into the surrounding landscape sooner.
CH2	Minimising effects of the Scheme on the settings of designated heritage assets	The design of lighting and traffic signals should take account of potential impacts to the setting of the designated heritage assets at Moat House. Traffic signals at the realigned A4019/ Moat Lane junction should not be directly visible from the Bridge and Attached Pair of Lodges, Moat House (NHLE 1154528). Detailed design should ensure the retention of the dark corridors between Uckington and Cheltenham, on the A4019, to preserve the distinct boundaries around Uckington and the designated heritage assets at Moat House.
PHH1	Effects on emergency vehicle movements through areas under construction traffic management, including from Cheltenham West Community Fire and Rescue Station	PC to develop and implement an Emergency Vehicle Movement Management Plan (see G4) as part of the Traffic Management Plan, for the movement of emergency vehicles and their access along the A4019 and the M5 during construction. This will need to apply to all emergency vehicles seeking to move through the Order limits under Blue Lights, and also egress from the West Cheltenham Fire Station for emergency response vehicles.
PHH2	Temporary disruption to access for community facilities during construction	PC to develop and implement temporary traffic management measures provide continuity of access and egress for all community facilities during the construction stage. This includes for the Cheltenham Civil Service Tennis and Football Clubs. A clear and consistent signage strategy will be designed and implemented to direct vehicle users during construction and to support access to community and recreational facilities, reflecting temporary changes to access arrangements. A clear and consistent signage strategy will be designed and implemented, to direct NMUs during construction and support access to community and recreational facilities; and bus stop provision, using footpaths and cycleways.
PHH3	Effectively informing people of construction works	PC tender evaluation process to include specific criteria relating to:

Ref	Objective of the commitment	Description of the mitigation measure or commitment
	and traffic arrangements to enable forward planning and manage expectations around nuisance and disruption, in the interests of human health	• proposed communication and engagement methodology and resources, including dedicated Public Liaison Officer (PLO), in anticipation of requirement to implement a Community Engagement Plan for the Scheme (see G4, PHH4 and PHH9). • proposals for the provision of support for the local community by the PC, associated with a process to assess needs, monetary value, and definition of how this would be spent. • Considerate Contractors accreditation/ affiliation/ certification. • track record in pro-active implementation of project-level community/stakeholder engagement plans.
PHH4	Effectively informing people of construction works and traffic arrangements to enable forward planning and manage expectations around nuisance and disruption, in the interests of human health	A Community Engagement Plan should be prepared and implemented, outlining the methods in which the local and surrounding community will be engaged during construction of the Scheme including contact details for key site management. The plan should provide consistent and clear communication to a range of stakeholders including, but not limited to residents, businesses, parish councils and local members (GCC and TBC). The plan must acknowledge the differing perspectives and issues of each stakeholder. The communication methods must seek to meet the inclusivity/accessibility needs of each stakeholder. The PLO (see PHH3 and 9) will lead the implementation of the Community Engagement Plan (see supplementary information (PHH9) about Community Engagement Plan content in relation to effects on human health determinants (mental health triggers)).
PHH5	Maintaining WCH access, connections to and availability of public transport during construction to avoid severance and loss of access to key services and facilities, in the interests of human health	Bus stop provision along the A4019 must been retained in line with Scheme proposals, ensuring public transport access along this corridor during construction. Public transport provision and rescheduling of services to reflect temporary stops should be discussed and agreed with local authorities, public bus companies and providers well in advance. Temporary stop relocation must be incorporated within the Traffic Management Plan (see G4) and should be based on targeted engagement to understand and respond to needs, to be led by the PLO. The PC should programme construction works so that affected PRoW, footpaths, or cycleways remain open for as much of the construction phase as is reasonably practicable and safe; and ensure that alternative routes are available as diversion routes for any temporary closures. The exception is bridleway ref.AUC1 which will be closed for the duration of the construction programme due to it being close to the main construction compound. No diversion route should exceed 250m overall additional length over the route that it is replacing. Temporary signalised crossing facilities should be provided along key WCH desire lines (including on the

Ref	Objective of the commitment	Description of the mitigation measure or commitment
		A4019 at Uckington) during the construction phase, as part of the Traffic Management Plan. A clear and consistent signage strategy will be designed and implemented, to direct users during construction and support access to community and recreational facilities; and bus stop provision, using footpaths and cycleways. Users of affected PRoW, footpaths and cycleways should be notified of planned diversions (including via information required as part of the Community Engagement Plan (PHH4)), with signs along sections to be closed during construction, at least one month prior to the works. Existing crossings and routes only to be diverted or closed once alternative routes are in place.
PHH6	Prevent adverse effects on human health determinants, derived from water, air and soil quality/pollutants and noise	PC to develop and implement a detailed Environmental Management Plan (2nd iteration) in accordance with the Environmental Management Plan (1st iteration), which will include measures for the construction phase, such as Best Practicable Means. The construction programme would also be kept to the minimum practicable time to reduce the duration of any landscape and visual impacts and areas would be cleared for construction as close as possible to works commencing and top soiling, reseeding, and planting shall be undertaken as soon as practicable after sections of work are complete. The EMP (1st iteration) will be used to inform the development of a post-construction monitoring programme, to be the responsibility of the Scheme promoter.
PHH7	Prevent adverse effects on human health determinants, derived from light pollution nuisance, disturbed sleep/night-time working	Work during hours of darkness would be avoided as far as practicable and, where necessary, directed lighting would be used to minimise light pollution/glare. Lighting levels would be kept to the minimum necessary for security and safety. In the operation of the Scheme, street lighting along the Link Road will be as per the Scheme design. Landscape planting for the Scheme will be as per the Environmental Masterplan. Sensitive design of noise barriers to ensure they provide visual as well as noise amenity (see also LV6).
PHH8	Minimising disruption to access for residents of the informal Traveller site adjacent to the M5	PC to maintain access to the informal Traveller site (adjacent to the M5) through fields to the north of the A4019 for the duration of the construction phase. The timing of the creation of this access will ensure that access is maintained to the informal Traveller site during construction of the Scheme. In operation of the Scheme, a new access track will be created to the north-east of the M5 Junction 10, as a replacement for the existing access points to the field areas and the informal Traveller site, that have been lost as a result of the new southbound off-slip.

Ref	Objective of the commitment	Description of the mitigation measure or commitment
PHH9	Prevent adverse effects on human health determinants relating to anxiety and stress and support those who experience difficulty adapting to change	Public Liaison Officer (PLO) full-time role to be filled for the duration of the construction phase. The PLO is expected to work directly with the PC (and sub-contractors as appropriate), the Scheme Promoter (GCC) and nominated individuals representing the local community. Scope of role to include (but not be limited to): • Responsibility for development, implementation, monitoring and updating of the Community Engagement Plan (see below). • Proactive engagement with the local community, to include face to face introductions for directly affected stakeholders. • Physical and regular presence within the community. • Establishing the feedback loop, process, and governance around implementing change in response to feedback during construction, where appropriate. • Commitment to responding to all communications, within agreed timescales and on an equitable basis, in cognisance of the GCC values in both representing and engaging with the local community. • Responsibility for managing communications, including Frequently Asked Questions. The PLO would be expected to provide regular updates and support at Scheme steering groups/board, in addition to the regular board updates that would be provided by the PC. A Community Engagement Plan should be prepared and implemented (by the PLO), outlining the methods in which the local and surrounding community will be engaged during construction of the Scheme including contact details for key site management. The Community Engagement Plan should provide consistent and clear communication to a range of stakeholders including, but not limited to residents, businesses, parish councils and local members (GCC and TBC). The Community Engagement Plan must acknowledge the differing perspectives and issues of each stakeholder. The communication methods must seek to meet the inclusivity/accessibility needs of each stakeholder. The PLO will lead the implementation of the Community Engagement Plan. The Community Engagement Plan should include (but not be limited to): • Contractor-led ‘Meet the Contractor’ events for supply chain to cover pre-planning and planning stages. • Contractor-led ‘Meet the Contractor’ share events for the local community.

Ref	Objective of the commitment	Description of the mitigation measure or commitment
		• Dedicated contact routes for the public and stakeholders, to include email, post and telephone number. • Frequent and regular presence of the PLO and key Project personnel within the community, through public drop in surgeries or similar. • Mechanisms for the supply of frequent and regular updates on traffic management and closures, including signed diversion routes, throughout the construction phase, which should be developed to reflect all relevant planned traffic works (i.e. from other GCC projects). • Commitment to maintain/input to Scheme website with latest information throughout the construction phase. • Commitment to input to Scheme bulletins on a frequent and regular basis throughout the construction phase, covering progress, upcoming activities and traffic management and closures. • Process for generating change within the Scheme in response to feedback, using the Compensation Event procedure.
PHH10	Minimising impacts on people from temporary land take (see also GS1)	The phasing of temporary land take for construction works should be planned in consultation with affected landowners (led by the PLO and PC, in accordance with the Community Engagement Plan) to enable early release of land and thereby minimise the extent of disruption. Land acquired temporarily for construction compounds and working areas will be restored to a condition equivalent to its original use, or such other condition as agreed with the relevant landowner, before being returned to its owner. Land within the Order limits that is not within the permanent footprint of the Scheme will be restored to its original use in agreement with landowners. Restoration of land occupied or disturbed during the construction process that is not permanently acquired for engineering and landscaping, will be subject to an aftercare period – during this agreed period any issues arising (e.g., settlement, drainage and weed infestation) will be rectified.
PHH11	Managing impacts on residential receptors (access)	PLO to prioritise direct liaison with owners/occupants of residential receptors anticipated to experience direct impacts on access during the construction phase, to ensure that suitable access and egress to their property is available at all times during the construction phase. This is to include (but not be limited to) residents at Homecroft Drive, Cooks Lane and along the A4019.
PHH12	Managing impacts on business receptors (access)	PLO to prioritise direct liaison with owners/lessees of business premises anticipated to experience direct impacts on access during the construction phase, to ensure that suitable access and egress to their property

Ref	Objective of the commitment	Description of the mitigation measure or commitment
		is available at all times during the construction phase, for all relevant business activities (i.e. staff and patron access, deliveries and servicing). This is to include (but not be limited to) businesses at Gallagher Retail Park and businesses accessed from Cooks Lane, as well as those experiencing land take and disruption to access arrangements.
PHH13	Managing impacts on community receptors (access)	PLO to prioritise direct liaison with operators/lessees of community facilities/premises anticipated to experience direct impacts on access during the construction phase, to ensure that suitable access and egress to their property is available at all times during the construction phase, for all relevant activities (i.e. staff/operator and patron access, deliveries and servicing).
PHH15	Providing accurate information to minimise temporary disruptions to access to development land and businesses	For temporary disruptions to access to development land and businesses, a clear and consistent signage strategy will be designed and implemented to direct motorists during construction and to support access to business and retail destinations, reflecting temporary changes to vehicular access arrangements. A clear and consistent signage strategy will be designed and implemented, to direct pedestrians and cyclists during construction and support access to business and retail facilities; and bus stop provision, using existing or replacement/temporary footpaths and cycleways.
PHH16	Minimising construction stage impacts to local residents in a targeted and responsive manner	PLO to liaise with local residents along and with key access via the A4019 (including Uckington and Cooks Lane) in order to discuss the sequence of construction works and explore/agree the potential merits of temporary measures such as (but not limited to) siting of acoustic barriers and hoardings as part of the establishment and progression of construction works along the A4019; and provision of public transport infrastructure or community transport options (e.g. for residents of Cooks Lane).
PHH17	Informing the local community of the improvements to accessibility, and connectivity.	A communications plan for the community to be produced in the early stages of the operational phase of the Scheme, with an aim of informing the local community (particularly residents, employees of premises in the Scheme area, road users and walkers, cyclists, and horse riders) of the improvements and encouraging their full use (for example enhanced accessibility and new connections).
PHH18	Safe access for pedestrians and cyclists through areas under traffic management.	PC to provide sufficient space (pavement width for example) to allow pedestrians, including wheelchair and pushchair users; and cyclists to travel safely through areas under traffic management.
CEA1	Reducing adverse inter-project cumulative construction impacts of the Scheme and other GCC and NH	PC will be required to submit all phasing plans associated with the management of construction traffic (as part of the Traffic Management Plan) to the GCC streetworks manager on a rolling monthly basis. This will ensure co-ordinated consideration of all streetworks intervention information across projects, capturing all booking system

Ref	Objective of the commitment	Description of the mitigation measure or commitment
	highways projects disrupting movement across the strategic and local transport network	requests for diversions on the GCC highway network; and works will not be implemented until approval and endorsement by GCC is attained. PC may be required to adapt proposals and scheduling in response to streetworks manager requests. The PLO will be required to coordinate dissemination of accurate network disruption information in advance, in accordance with the Communication Engagement Plan. This information should incorporate interfaces with other project impacts on the transportation network, to the extent that they are known (see also PHH4 and PHH9).
CEA2	Seeking to secure the continued efficacy and realise long term benefits of the Scheme environmental design in the context of strategic development sites, to manage inter-project cumulative effects	GCC is committed to seeking to establish the right level of discussion, meeting, planning, coordination of programmes and engagement with the public and other stakeholders between GCC officers, the Scheme PC and relevant developers of the safeguarded land to the north-west of Cheltenham, the North West Cheltenham Development Area and the West Cheltenham Development Area. The aim of these endeavours by GCC will be to ensure that proposals for change at these locations complement the intentions of the Scheme, particularly in relation to securing functional ecosystems that continue to support the protected species known to be present in the study area; building on the landscape structure; maintaining connectivity for WCH routes; as well as engaging meaningfully with local communities and stakeholders to support people in adapting to transformational change. The environmental design for the Scheme (Environmental Masterplan (application document TR010063/APP/2.13)) has been developed to dovetail with the published masterplan that accompanies the outline application that has been made for the Elms Park proposals at the North West Cheltenham Development Area (application reference 16/02000/OUT). Detailed design of the Scheme offers further opportunities for the interface with the Elms Park proposals to be refined, subject to the timeframes of third party developers. Maintenance of the Scheme environmental measures is part of LV3. Correct maintenance of new vegetation is part of LV4.
Relevant aspects of the Scheme design		
SD1	Scheme design: Junction changes on the A4019	Scheme design (see General Arrangements Plans (application document TR010063/APP/2.9)) incorporates specific elements of access improvements within junction design. The following changes will be made to the existing junctions on the A4019, alongside the creation of three new junctions. For residents and businesses whose current access is directly onto the A4019 (for example those in Uckington, and along the southern side of the A4019 in north-west Cheltenham), short sections of new access roads will be created alongside the widened A4019 to facilitate ease of access both westbound and eastbound and will join the A4019 at signalised junctions.

Ref	Objective of the commitment	Description of the mitigation measure or commitment
		• Stoke Road – no change made to the existing junction. • Stanboro Lane – existing junction location retained, with minor changes made to the mouth of the junction. Left and right turning from the junction retained. • Withybridge Lane – existing junction location retained, but access changed to left turn into Withybridge Lane, and left turn only out onto the A4019. • Cooks Lane – existing junction closed, with access from Cooks Lane to the A4019 diverted through to the Link Road via a new access road. • The Green and Moat Lane – modified to form a single signalised crossroads. • West Cheltenham Fire Station – access for emergency vehicles retained with left and right turning onto the A4019. Access for non-emergency vehicles diverted onto a new access road and joining the A4019 at a new junction (referred to as Site Access B). • Homecroft Drive and Sandpiper Drive - existing junctions closed, with access to the A4019 diverted through to the Site Access B junction via a new access road. • Civil Service Sports Ground – existing junction location retained but changed to a signalised crossroads (the Site Access B junction). For traffic westbound on the A4019, the right turn at this junction will be for buses only. • B4634 (Hayden Road) – the Gallagher Junction. Existing junction location retained, but with the layout changed. This will become the Site Access C junction into the proposed North West Cheltenham Development site.
SD2	Scheme design: Active Travel Corridors	The layout and design for facilities for pedestrians and cyclists are shown in the General Arrangements Plans (application document TR010063/APP/2.9). The Scheme design includes an active travel corridor along the length of the Link Road and the A4019 (within the extents of the Scheme). This will provide traffic free space for cyclists and pedestrians with the objective of reducing car journeys through the Scheme and thereby reducing noise and air quality impacts, as well as providing exercise opportunities for people. The Link Road has a segregated cycleway (3m in width) and footway (2m in width) all the way along its west side. To the west of the junction, the Scheme will provide a parallel cycle and pedestrian crossing of the B4634, incorporated into the signalised junction, to allow the future continuation of the proposed cycling and pedestrian route into the West Cheltenham Development Area.

Ref	Objective of the commitment	Description of the mitigation measure or commitment
		The Scheme will include a segregated cycleway (3m width) and footway (2m width) on the northern side of the A4019, which with the exception of a short section of shared use path through Uckington will extend from the junction of the A4019 with Stanboro Lane in the west through to the Gallagher junction at the eastern end of the Scheme. This active travel corridor will provide connectivity for pedestrians and cyclists between north-west Cheltenham and the junction of the A4019 and Stanboro Lane (west of M5 Junction 10). It will tie into an existing shared use path at the eastern end of the Scheme, and an existing footway at the western end. The B4634 will be widened to the south of its existing alignment to allow for the provision of a 2m wide shared use path along the northern verge through to the junction of the B4634 and Withybridge Lane. This will provide a connection between the walking and cycling provision on the Link Road and Withybridge Lane.
SD3	Scheme Design: Bus lane provision and relocation of bus stops	The Scheme includes a bus lane along the eastbound carriageway of the A4019. Locations of the existing bus stops along the A4019 were reviewed with the following changes made as a result of the Scheme: • Stanboro Lane bus stops (west of Junction 10) will not be re-provided due to the limited number of properties at that location and the proximity of the Gloucester Old Spot bus stops to the west, which will be retained. • Withybridge Lane bus stops will not be re-provided due to the removal of all existing properties at that location. • Cooks Lane bus stops are to be re-located closer to Uckington and the proposed signalised crossing facilities. The eastbound and westbound stops are located as in lane stops just to the east of the junction of The Green and the A4019 in Uckington. Pedestrian access is provided to both from the signalised junction in Uckington. • Bus stops adjacent to the Elms Park development are to be re-provided and will be located as layby stops between Site Access A and Site Access B. Pedestrian access is provided to both from the signalised junction at Site Access A. Pedestrian access will also be possible to the westbound stop from the adjacent access road, through a gap in the noise barrier. • An additional pair of bus stops located at the eastern extents of the Scheme are also likely to be re-provided part of the detailed design. These additional bus stops would be adjacent to the Sainsburys store. The proposed bus stops adjacent to the Elms Park development are considered the most likely to have high usage due to the suitability of this location to serve the Elms Park development. These proposed stops have

Ref	Objective of the commitment	Description of the mitigation measure or commitment
		therefore been upgraded to lay-by type bus stops, rather than in-lane stops
SD4	Scheme Design: Access for properties at Uckington	Scheme design (see General Arrangements Plans (application document TR010063/APP/2.9)) incorporates specific elements of access improvements for properties to the north and south of the A4019 at Uckington. WCH access to the Shared Use Path and realignment of the junction between Moat Lane and the A4019 in Uckington with phase crossing provision.
SD5	Scheme Design: Junction Design for Strategic Sites	Junction design (see General Arrangements Plans (application document TR010063/APP/2.9)) incorporates primary access into these strategic sites (North West Cheltenham Development Area; West Cheltenham Development Area; and safeguarded land to the north-west of Cheltenham) from the A4019 and B4634. Three new junctions will be created to provide access into the proposed North West Cheltenham Development Area: • A slip lane – opposite the West Cheltenham Fire Station for eastbound traffic on the A4019 into the North West Cheltenham Development Area. • Site Access A – a signalised T-junction opposite Homecroft Drive. • Site Access B – a signalised crossroads incorporating the existing access from the Civil Service Sports Ground. The new access road from the West Cheltenham Fire Station, Homecroft Drive and Sandpiper Drive will feed into the southern arm of this junction. To provide improved access for buses, bus gates eastbound along the A4019, into Site Access A and Site Access B, have been included in the preliminary design. In addition, a bus lane and a bus gate have been included respectively on the A4019 eastbound, between Site Access A and the Gallagher junction, and eastbound into the Gallagher junction.
Relevant aspects of the Traffic Management Plan		
SD6	Managing access during construction	Withybridge Lane is to be retained as it provides access to several farms and farmland. Access will be maintained from the B4634 for the duration of the works. Access from the A4019 will be closed while the new junction is constructed. Access is to be maintained throughout construction to Cooks Lane, Moat Lane, and Green Lane, either directly from the A4019 or by local diversions. Provide temporary signalised crossing facilities on the A4019 at Uckington during the construction phase, as part of the traffic management plan.
SD7	M5 Junction Movements during construction	The existing M5 Junction 10 traffic movements are to be retained until such time as closure of the southbound off slip and northbound on slip are necessitated by the construction phasing of the interchange construction.

Ref	Objective of the commitment	Description of the mitigation measure or commitment
		Contraflow on the M5 is to be kept to the minimum duration consistent with safely and efficiently constructing the Scheme. M5 closures are minimised as far as is practicable.

13.10.3. There is no environmental mitigation for permanent land-take and building demolition. Financial compensation through the compulsory purchase process is a matter for negotiation between the district valuer and landowner and is outside the scope of this ES.

13.11. Residual effects – Population

13.11.1. This section summarises the impacts that have the potential to result in significant effects once approaches to avoiding, lessening, or mitigating effects have been taken into account. The summary assumes that both embedded and essential mitigation measures are fully implemented, resulting in the identification of significant residual effects.

Private property and housing

13.11.2. The Scheme requires the demolition of 32 private properties as described in Table 13-11 and reiterated here:

- Three residential properties in the vicinity of Sheldon Nurseries on Stanboro Lane to the north of the A4019 and west of the M5.
- All fourteen residential properties at Withybridge Gardens, plus associated garages, and garden outbuildings.
- Two residential properties at Withy Bridge, to the north of the A4019 near Withybridge Lane, plus associated garages and garden outbuildings.
- Three residential properties at Uckington, to the south of the A4019.
- Ten residential properties (comprising five semi-detached buildings) to the east of the West Cheltenham Fire Station.

13.11.3. The demolition of the residential properties and all associated buildings together with the loss of gardens represents a **large adverse residual construction effect** for the affected residents **which is significant**. There is no mitigation for this – it is a matter for compensation through the compulsory purchase process and sits outside the scope of the ES.

13.11.4. Three receptors have been assessed as experiencing **moderate adverse residual construction effects** due to changes to key characteristics:

- Residents of the community of Uckington, in relation to changes to key rural characteristics from construction works, demolition of buildings and the introduction of urbanising features along the A4019 corridor.
- Residents of the informal Traveller site to the north of the M5 Junction 10 and adjacent to the M5 corridor, with changes to key characteristics due to land take and loss of vegetation that provides screening (acoustic and visual) and enclosure to the western edge of the site.
- Residents of Sheldon Cottages, which comprises two semi-detached residential properties accessed from Stanboro Lane to the north-west of M5 Junction 10, in relation to changes to the characteristics from construction works, demolition of adjacent buildings, the reconfiguration of the access and formation of earthworks.

13.11.5. The **moderate adverse residual construction effects** are **significant.** Essential mitigation has been proposed that includes further engagement and the development of collaborative solutions with the affected residents and, in the case of Sheldon Cottages, opportunities for the residents to relocate during part or all of the construction phase. Depending on how this mitigation manifests in practice, there is the potential for the significance to be reduced.

13.11.6. Incoming residents of two planned developments within the Policy A4 North West Cheltenham Development Area have been assessed as experiencing **moderate adverse residual construction effects** due to impacts on access via the A4019 from construction activities and traffic management. This is a proportion of the planned development related seeking consent under application no. 20/00759/FUL at Swindon ~~Village~~ Farm (for the purposes of assessment, an assumption has been made that 25% of the homes will be complete prior to Scheme construction rising to up to 75% of the development being in place within the Scheme construction phase, equating to 195 residential properties); and no. 23/00354/OUT (an assumption has been made that up to 25% of the development may be in place within the Scheme construction phase, equating to 45 residential properties). Both construction traffic and incoming residents would be expected to use the A4019 as a key access route, although alternative options are available from the east. Essential mitigation has been proposed through the CEA process, which focuses on successful co-ordination, programming, and community engagement in relation to the interaction of the Scheme and this development proposal. As this relies on third parties, the assessment has taken a precautionary approach. Depending on how this mitigation manifests in practice, there is the potential for the significance to be reduced.

13.11.7. No other significant adverse or beneficial residual effects are predicted for private property and housing receptors in the construction phase.

13.11.8. One receptor – the retained residential properties at Uckington – has been assessed as experiencing **moderate adverse residual operational effects.** This is due to impacts on key characteristics of the settlement from demolition of buildings and urbanisation of the junction of The Green with the A4019 and the A4019 corridor.

13.11.9. No other significant adverse residual effects are predicted for private property and housing receptors in the operational phase.

13.11.10. A number of beneficial residual effects have been identified for private property and housing in the operational phase of the Scheme. The following receptors are predicted to experience **moderate beneficial residual operational effects, which are significant** due to improvements to access for a range of modes arising from Scheme implementation:

- <30 homes at Uckington.
- <30 homes adjacent to M5 Junction 10, including at Stanboro Lane and fronting the A4019.
- Sheldon Cottages.
- Informal Traveller site adjacent to the M5, north of Junction 10.
- Voyage Care, Orchard Leigh.
- <30 homes at Boddington.
- Properties west of Elmstone Hardwicke.
- Application 21/00872/REM – Phase one, Land at Old Gloucester Road (Policy HD8).
- Application 21/02832/OUT – Lansdown Industrial Estate (Policy H2).

13.11.11. The following receptors are predicted to experience **large beneficial residual operational effects, which are significant** due to improvements to access for a range of modes arising from Scheme implementation:

- Policy A4 – the North West Cheltenham Development Area (4285 homes), associated with application 16/02000/OUT (4115 homes).
- Application 20/00759/FUL (266 homes), within the North West Cheltenham Development area (Policy A4).
- Application 23/00354/OUT (180 homes, within the North West Cheltenham Development area (Policy A4).
- Policy A7 – West Cheltenham Development Area (1100 homes) associated with application 22/01817/OUT and 22/01107/OUT.
- Policy SD5 – safeguarded land to the north-west of Cheltenham, north east of M5

Junction 10 (assumed for the ES to be at least 2000 homes).

- Properties in north-west Cheltenham (well over the150 home threshold used in the assessment).
- Properties between Uckington and the Gallagher Retail Park, fronting or accessed from the A4019.

Community land and assets

13.11.12. One receptor – West Cheltenham Fire Station – has been assessed as experiencing **moderate adverse residual construction effects**. This is due to impacts on the provision of emergency access/response through the areas under traffic management during the construction works. Essential mitigation has been identified in the form of an emergency vehicle movement plan; however, the assessment is precautionary, recognising that the effectiveness of the mitigation depends on the PC and the ability to avoid any unforeseen conflicts between construction activities and vehicle passage during an emergency response.

13.11.13. No other significant adverse or beneficial residual effects are predicted for community land and assets in the construction phase.

13.11.14. Two receptors are predicted to experience **moderate beneficial residual operational effects**, which are significant, due to improvements to access for a range of modes arising from Scheme implementation:

- Cheltenham Civil Service Tennis and Football Clubs.
- West Cheltenham Fire Station.

13.11.15. No significant adverse residual effects are predicted for community land and assets in the operational phase.

Development land and businesses

13.11.16. The Scheme requires the demolition of two business premises as described in Table 13-15, Gloucester Detailing valeting service and premises at Sheldon Nurseries. This represents a **large adverse residual construction effect** for the affected businesses **which is significant**. There is no mitigation for this – it is a matter for compensation through the compulsory purchase process and sits outside the scope of the ES.

13.11.17. Two receptors – Gallagher Retail Park and Kingsditch Trading Estate – have been assessed as experiencing **moderate adverse residual construction effects.** This is due to impacts on access to these shopping and trading destinations and in recognition that due to the nature of the use, interruptions or delays to access may affect operational requirements, as well as deter customers. Essential mitigation has been identified that includes for close liaison between the PLO and affected businesses in order to tailor traffic management and this has the potential to reduce the magnitude of the impact; however, a precautionary approach has been taken to the assessment to reflect the inherent uncertainty of how this will manifest once the PC is in place.

13.11.18. One other **moderate adverse residual construction effect** is predicted for development land and business, relating to the loss of the established business location (lay-by) for the Junction 10 breakfast van, **which is significant.** The business is mobile in nature and essential mitigation allows for discussions regarding the identification of mitigation for this adverse effect – it is possible that this will reduce the magnitude of the impact; however, a precautionary approach has been taken to the assessment to reflect the inherent uncertainty of how this will manifest once discussions conclude.

13.11.19. No other significant adverse or beneficial residual effects are predicted for development land and businesses in the construction phase.

13.11.20. The following receptors are predicted to experience **moderate beneficial residual operational effects, which are significant** due to improvements to access for a range of modes arising from Scheme implementation:

- Bailey's Nurseries.

- Aldi and neighbouring business premises at the A4019, B4634 junction.
- Gloucester Old Spot public house.
- Stanboro Cottage Fish Farm.
- Elmstone Business Park.
- Blaisdon Way Commercial Premises.
- The House in the Tree public house.
- Comfy Campers.
- Cheltenham Auto Services.
- Distinctive Ironwork.
- Premier Inn Cheltenham north-west and associated restaurants.
- Arle Nursery.
- Cheltenham Fencing.
- Applegreen filling station and associated businesses.
- Holmedale Guest House.
- Gateway Retail Park.

13.11.21. The following receptors are predicted to experience **large beneficial residual operational effects, which are significant** due to improvements to access for a range of modes arising from Scheme implementation:

- Gallagher Retail Park.
- Kingsditch Trading Estate.
- Policy A4 – North West Cheltenham Development Area (23 ha. employment allocation).
- Policy A7 – West Cheltenham Development Area (45 ha. employment allocation).

13.11.22. No significant adverse residual effects are predicted for development land and businesses in the operational phase.

Agricultural land holdings

13.11.23. Agricultural land temporarily acquired for haul roads and construction compounds will be restored to farming and so the residual effect will be neutral.

13.11.24. Alternative field accesses are incorporated into the Scheme design, where necessary, so there is no real change in terms of farming operations apart from some slightly longer journey times.

13.11.25. Repair of field drains and replacement of water troughs will have been carried out by the end of construction and so the effect will be **neutral**.

13.11.26. Permanent agricultural land-take cannot be mitigated and this, coupled with the effects of division of land on internal farm traffic and livestock movements by the proposed Link Road, means the residual effect on the four holdings will be **moderate adverse which is significant**. The affected holdings are C, F, H and I, all of which are severed by the Link Road. This is detrimental to the farm businesses, but with changes to management, they should remain viable.

13.11.27. Holding B will host the Flood Storage Area and lose woodland for which it received Farm Woodland Scheme payments. At this farm, the residual effects will be **large adverse, which is significant.** This is very detrimental to the farm business and may compromise its viability.

13.11.28. There is no essential mitigation appropriate for these impacts. Compensation will be required, which is outside the scope of the ES.

Walkers, cyclists and horse riders

13.11.29. The following receptors are predicted to experience **moderate adverse residual construction effects** due to the length of diversion required to maintain WCH movement during the construction phase:

- Uckington footpath 8 (AUC8).
- Boddington footpath 14 (ABO14).

13.11.30. The following receptors are predicted to experience **large adverse residual construction effects** due to the length of diversion required to maintain WCH movement during the construction phase:

- Boddington footpath 16 (ABO16).
- Uckington footpath 11 (AUC11).
- Boddington footpath 24 (ABO24).
- Cheltenham Circular Route, including AUC8, AUC14 and ABO25.

13.11.31. One receptor – Uckington Bridleway 1 (AUC1) – is predicted to experience **very large adverse residual construction effects** due to the closure of the route to horse riders for the duration of the construction works. This has been identified through the consultation process as important for the safety of horses, which are to be kept apart from construction activities, and therefore also for horse riders. There is also a severance of the route and diversion for other user groups.

13.11.32. There are no other significant adverse residual effects predicted for other WCH in the construction phase.

13.11.33. The impacts on the WCH network occur in the construction phase. The Scheme design reinstates routes along different alignments, and these are realised within the construction phase. There are therefore no identified significant residual effects relating to WCH for the Scheme, for the operational phase.

13.11.34. The population assessment focuses on changes to journey length only. Aspects of the Scheme design that introduce new WCH assets and their attendant impacts are addressed within the Human Health assessment.

13.12. Baseline conditions – Human Health

13.12.1. The definition of baseline conditions follows the standard provided in DMRB LA 112. The baseline data is used for two key purposes – firstly, identifying relevant receptors within the study area, including the presence of any vulnerable groups that may be more susceptible to impacts from changes in determinants of health; and secondly, to inform the assignment of sensitivity category for each receptor, using the indicative criteria within the latest IEMA guidance. The data collation process has also been developed to reflect the IEMA guidance on significance in human health assessment, to include knowledge gathering around the six areas noted as contributing to human health sensitivity within that guidance (para. 7.9):

- Deprivation.
- Resource sharing (for example, assets supporting human health).
- Existing inequalities (for example, comparing local and national life expectancy).
- Outlook (for example, taking account of responses received through consultation and engagement).
- Life stage, health status and daily activities (based on published data).
- Capacity of populations to adapt (a professional judgement based on an evaluation of the above).

13.12.2. The human health baseline focuses on the human health profile for the wards that comprise the study area, including demographic profile, demographic trends, socio-economics, deprivation, health and wellbeing characteristics, and general characteristics of the natural and built environment.

13.12.3. There are two Local Authorities of relevance to the Scheme – TBC and CBC, with relevant wards within the local authorities currently being Badgeworth, Churchdown St John's, Severn Vale North, and Severn Vale South (TBC area); and Springbank, Swindon Village and St Peter's wards (CBC area). Note that the majority of the Order limits are located within Badgeworth and Severn Vale South wards.

13.12.4. This section provides an overview of the available health statistics and trends information for residents who are living in the wards of the study area. It starts with a general review of headline statistics and trends drawn from published sources, including the Gloucestershire Joint Strategic Needs Assessment 2017 (JSNA)[23]. There is then a focus on data for the relevant wards.

Headline health statistics and trends for the study area

13.12.5. The JSNA is an assessment of current and future health and social care needs for the local community. It is used to inform the Gloucestershire Joint Health and Wellbeing Strategy 2020-2030 (JHWS)[24], which provides the route for meeting the needs identified in the JSNA. General trends outlined in the JSNA include:

- In Gloucestershire, the growth of the older population (aged 65 and above) in the county continues to outpace that of the younger population.
- High white British ethnicity in all districts of Gloucestershire, 94.3% in Cheltenham[25] and 97.5% in Tewkesbury[26]. 'White-other' is the next largest minority group in the county.
- The three leading causes of death in Cheltenham and Tewkesbury, are cancer, cardiovascular disease, and respiratory disease, respectively.

13.12.6. Future trends outlined in the JSNA include:

- Population projections between 2015-2039 estimate an 1.8% increase in those aged 18-64 in Gloucestershire and an 66.6% increase in over-65s in that period. The projected increase in over-65s in Gloucestershire is set to rise at a faster pace than the national estimated increase.
- Out of the six districts in Gloucestershire, Tewkesbury and Gloucester are estimated to have the fastest growing populations over the next 25 years (24.5% and 19.9% respectively) within the county.

13.12.7. The key priorities within the Gloucestershire Joint Health and Wellbeing Strategy 2020-2030 relate to physical activity; adverse childhood experiences; mental well-being; social isolation and loneliness; healthy lifestyles; early years and best start in life; and health and housing.

13.12.8. Inform Gloucestershire[27] produced a report outlining the needs of adults with mental health concerns in Gloucestershire to understand the impact of future demand for social care. General trends in the report include:

- The number of people aged 18 years and over in Gloucestershire diagnosed by GPs with depression has increased from 27,043 people in 2012/13 to 52,777 people in 2018/19, an increase of 95%.
- Small Area Mental Health Index highlights that the areas of poorest mental health in Gloucestershire (relative to England) lie in Cheltenham, Gloucester, and the Forest of Dean.

[23] Gloucestershire Health and Wellbeing Board. 2017. Understanding Gloucestershire JSNA. Available at: ugjsna_2017-14.pdf (gloucestershire.gov.uk). [Accessed on: 22/11/2022]
[24] Gloucestershire Health and Wellbeing Board. 2020. Joint Health and Wellbeing Strategy. At: gcc_2596-joint-health-and-wellbeing-strategy_dev12.pdf (gloucestershire.gov.uk) [Accessed on: 22/11/2022]
[25] Gloucestershire County Council. 2015. Understanding Cheltenham. At: understanding_cheltenham-27.pdf (gloucestershire.gov.uk) [Accessed on: 22/11/2022]
[26] Gloucestershire County Council. 2015. Understanding Tewkesbury Borough. At: understanding_tewkesbury__borough-4.pdf (gloucestershire.gov.uk) [Accessed on: 22/11/2022]
[27] Inform Gloucestershire 2019. Adults with mental health need in Gloucestershire. Prevalence of needs. At: mh-prevalance-of-needs-2019-final.pdf (gloucestershire.gov.uk) [Accessed on: 22/11/2022]

Local public health profile of the study area

13.12.9. The study area falls into six current electoral wards. TBC's electoral ward boundaries of relevance to the Scheme comprise Badgeworth, Severn Vale North and Severn Vale South wards. CBC's electoral ward boundaries of relevance to the Scheme comprise Springbank, Swindon Village and St Peter's wards. Appendix 13-1 of this document (application document TR010063/APP/6.15) includes figures of these ward boundaries.

13.12.10. The public health information available is based on recently published strategies, health and wellbeing information, and new Census 2021 data. Insights profiles generated by GCC for the purposes of this assessment have also been utilised. The Insights profiles use a combination of 2011 and 2021 data. A limited release of 2021 data has been made to date with some relevant datasets at the appropriate ward level unavailable at the time of writing, therefore 2011 Census data remains present where more up to date datasets are currently unavailable.

Badgeworth

Figure 13-5 - Badgeworth ward boundary

Figure provided in Appendix 13.1 (application document TR010063/APP/6.15)

13.12.11. Badgeworth ward extends south from M5 Junction 10, between Cheltenham and Gloucester, broadly following the alignment of the M5 to Junction 11 and then continuing south-east. The north-eastern part of the ward includes a large section of the Order limits, encompassing M5 Junction 10 and the proposed alignment of the Link Road. The ward is predominantly rural and includes few residential settlements.

13.12.12. It is likely that residents of the northern part of the ward will make regular journeys along the A4019 and/or through the M5 Junction 10, either to access the motorway or to connect to the A38 towards Gloucester or Tewkesbury. Residents in the more southerly parts of the ward have access to alternative parts of the strategic road network that are outside the Order limits (e.g. M5 Junction 11 and the A40).

13.12.13. The ward is partially within the catchment area for Shurdington C of E Primary School. It is unlikely that extensive numbers of residents within the ward will be required to travel through the Order limits in order to access this educational facility.

Severn Vale North

Figure 13-6 - Severn Vale North ward boundary

Figure provided in Appendix 13.1 (application document TR010063/APP/6.15)

13.12.14. Severn Vale North covers the northern section of the Order limits, north of M5 Junction 10 and south of Tewkesbury. The ward is a largely rural area and includes a solar panel farm and few residential hamlets.

13.12.15. The A38 and M5 carriageway passes north to south through the ward. The A4019 and M5 Junction 10 are partially within the southern edge of the ward boundary. This section of the transport network in the ward is likely to provide a key route for residents visiting Tewkesbury and Gloucester via the A38, and Cheltenham via the A4019. Daily movements of ward residents through the study area are anticipated to be relatively limited due to the small number of residents.

13.12.16. The Deerhust and Apperley C of E Primary School and Tredington Primary School are within the ward. Other educational facilities whose catchments cover parts of the ward but are situated outside of the ward boundary in Bishop's Cleeve and Tewksbury. It is not anticipated that a large number of ward residents will make regular journeys through the Order limits to access schooling.

Severn Vale South

Figure 13-7 - Severn Vale South ward boundary

Figure provided in Appendix 13.1 (application document TR010063/APP/6.15)

13.12.17. Severn Vale South is located north-west of Cheltenham and covers a large section of the Order limits, as well as part of M5 Junction 10. This ward straddles the M5 and extends west from the M5, covering a largely rural area to the north of Gloucester. There are few residential settlements within the ward (Uckington, part of Elmstone Hardwicke, North, Sandhurst and part of Down Hatherley).

13.12.18. The A38 and M5 carriageway pass from north to south in the eastern part of the ward. Part of the B4634 and the A4019 cross the ward near the eastern boundary of the ward.

13.12.19. There are a few key services provided within the ward including Uckington and Elmstone Hardwicke Village Hall, St Mary Magdalene Boddington Church as well as some outdoor sports facilities. It is likely that residents of this part of the study area will use the A4019 to access the greater choice of facilities and services on the western edge and in the town centre of Cheltenham – these routes are within the Order limits.

13.12.20. There are no specific school catchments within this ward. Schooling provisions for residents west of the M5 carriageway are likely to be located outside of the ward towards Tewkesbury and Gloucester accessible via the A38. It is not anticipated that a large number of ward residents will make regular journeys through the Order limits to access schooling. The exception is likely to be school age residents of Uckington and the properties within the ward that are located to the south-east of M5 Junction 10 and along the A4019.

Springbank

Figure 13-8 - Springbank ward boundary

Figure provided in Appendix 13.1 (application document TR010063/APP/6.15)

13.12.21. Springbank ward is partially located at the eastern edge of the Order limits, extending away from the Scheme to form the western fringe of Cheltenham. The ward is largely residential and movements through the Order limits are likely in order for residents to access their properties from destinations to the west, including M5 Junction 10 via the A4019 and B4634.

13.12.22. Key services are provided within the ward including green open space facilities and local shops, possibly limiting extensive movements through the Order limits to access day to day recreational and open space facilities or basic groceries. For a wider range of community and healthcare facilities, it is likely that residents may rely upon Cheltenham – alternatives are available that would avoid travel for the majority of residents through the Order limits.

13.12.23. The ward is wholly within the catchment area for Springbank Primary Academy, All Saints' Academy (secondary) and Hesters Way Primary School. Residents within this ward are located close to the educational facilities listed above and can access them without crossing the Order limits.

St Peter's

Figure 13-9 - St Peter's ward boundary

Figure provided in Appendix 13.1 (application document TR010063/APP/6.15)

13.12.24. St Peter's ward is located just beyond the eastern extent of the Order limits, on the western fringe of Cheltenham, adjacent to Swindon Village ward and Springbank ward.

The ward includes parts of the Kingsmead Industrial Estate, Alstone Trading Estate and Cheltenham Trade Park and the residential areas of Alstone and St Peters.

13.12.25. The A4019 aligns with the northern ward boundary and residents in the west of the ward are expected to make frequent use of this transport corridor in accessing destinations towards Cheltenham, albeit that Arle Road does offer an alternative route.

13.12.26. Key services provided within the ward include green open space facilities, the YMCA Sports Centre, Underwood doctor's surgery and a Tesco Superstore. The presence of employment sites and key services within the ward could possibly limit extensive movements by residents through the Order limits to access day to day services and facilities.

13.12.27. The residents of the ward are in the catchment areas for several schools. These include Gloucester Road Primary School, Christ Church C of E Primary School, and All Saint's Academy. Residents within the ward are located close to these educational facilities and can access them without crossing the Order limits.

Swindon Village

Figure 13-10 - Swindon Village ward boundary

Figure provided in Appendix 13.1 (application document TR010063/APP/6.15)

13.12.28. Swindon Village ward includes part of the eastern extents of the Order limits (the section of the A4019 immediately south of Gallagher Retail Park), situated on the western fringe of Cheltenham, directly north of Springbank ward. The ward includes the residential areas of Wymans Brook and Swindon Village, although the majority of the ward is rural in nature.

13.12.29. Many key services are provided within the ward including a variety of retail and recreational opportunities and green open space facilities. These can be accessed by residents without passing through the Order limits, potentially limiting extensive movements through the study area to access day to day services and facilities. However, Manor Road and Kingsditch Lane serve as strategic routes through the ward, and both connect to the A4019 just to the east of the Order limits and ward residents would be expected to pass through the Order limits for access to the motorway network and/or the A38 to the west.

13.12.30. The ward is wholly within the catchment area for Swindon Village Primary School. Residents within this ward are located close to this educational facility and can access it without crossing the Order limits. However, travel across the Order limits is likely to be required in order to access secondary schools.

Health statistics

13.12.31. The following statistics are largely derived from Census data and information from Public Health England.

13.12.32. Further demographic and health data has also been provided by GCC in the form of Local Insight profiles for each ward within the study area. The Local Insight profile data has been updated with Census 2021 where datasets are available, in some cases, 2011 Census data features where more up to date is currently unavailable.

Table 13-20 - Baseline conditions – Human health: Demographic profile[28]

Location	Population	% Under 16	% Working Age (16 to 64)	% Over 65
Badgeworth	2670	16.4	57.5	26.1

[28] ONS 2021 Census. Available at: Census - Office for National Statistics (ons.gov.uk).

Location	Population	% Under 16	% Working Age (16 to 64)	% Over 65
Severn Vale North	2603	18.1	58.9	23.0
Severn Vale South	2341	12.9	61.6	25.5
Springbank	6930	20.8	63.0	16.2
St. Peter's	7364	16.4	71.3	12.2
Swindon Village	5562	17.6	62.3	20.1
Gloucestershire	645,076	17.8	60.8	21.7
England	56,490,048	18.6	63.0	18.4

13.12.33. Table 13-20 displays the structure of the population by broad age bands of the wards within the study area, as well as the Gloucestershire and England averages. This sets the context that for the County, the trend is towards a population that is older than the national average and has a smaller proportion of younger residents.

13.12.34. In terms of the proportion of the population over 65, St Peter's and Springbank stand out as substantially below the national and county average, which contrasts with the other wards of the study area.

13.12.35. Springbank and St Peter's wards have a greater percentage of under 16 year old residents than over 65 within their respective wards, with Springbank having a higher proportion of under 16s than the national and county averages. All other wards have a greater proportion of older residents than younger, each exhibiting percentages above the national average for over 65s.

13.12.36. The elderly and the young are both more susceptible to health issues and have a heavier reliance on primary healthcare. Both age groups will also have greater needs in terms of social infrastructure, and both age groups tend to have greater reliance on public transport, walking and cycling. The wards that form the study area are therefore considered to have a greater susceptibility to health issues than the national average in terms of the proportion of the population who are under 16 and over 65, noting that there are clear spatial differences in the distribution of the older and younger residents through the study area.

Table 13-21 – Baseline conditions – Human health: General health of residents [29]

Location	%Very good health	% Good Health	% Fair Health	% Bad health	% Very bad health
Badgeworth	49.1	32.3	13.6	4.0	1.0
Severn Vale North	51.5	34.6	10.0	3.1	0.8
Severn Vale South	49.5	35.0	11.4	3.2	0.8
Springbank	46.2	35.6	13.3	3.7	1.1

[29] ONS 2021 Census. Available at: Census - Office for National Statistics (ons.gov.uk).

Location	%Very good health	% Good Health	% Fair Health	% Bad health	% Very bad health
St. Peter's	48.5	35.2	12.2	3.2	0.9
Swindon Village	45.8	36.3	13.3	3.6	1.0
England	48.5	33.7	12.7	4.0	1.2

13.12.37. Table 13-21 displays the various levels of health within the six wards. Badgeworth, Severn Vale North and Severn Vale South are above the national average for 'very good health', while the other wards are or slightly below the national average. All wards have lower percentages than the national average for residents with very bad health, with notably lower levels in Severn Vale North, Severn Vale South, and St. Peter's.

13.12.38. All wards are above the national average for 'good health', with the exception of Badgeworth.

13.12.39. All wards are below the national average for 'bad health', with the exception of Badgeworth which is the same as the national average.

13.12.40. The figures indicate that although the population of the study area as a whole has a higher proportion of over 65s than the national average, this has generally not resulted in an increased realisation of incidences of poor health. It should be noted, however, that figures for Badgeworth are less favourable when compared to the other wards.

Table 13-22 – Baseline conditions – Human health: Disability [30]

Location	% Disabled under the Equality Act: **Day-to-day activities limited a lot**	% Disabled under the Equality Act: **Day-to-day activities limited a little**	% Not disabled under the Equality Act: **Has long-term physical or mental health condition but day to day activities are not limited**	% Not disabled under the Equality Act: **No long-term physical or mental health conditions**
Badgeworth	7.7	9.8	8.8	73.7
Severn Vale North	5.8	9.1	7.9	77.2
Severn Vale South	6.3	9.9	7.7	76.1
Springbank	7.8	9.8	6.7	75.7
St. Peter's	6.0	10.4	7.4	76.3
Swindon Village	6.6	9.8	7.5	76.1
England	7.3	10.0	6.8	75.9

[30] ONS 2021 Census. Available at: Census - Office for National Statistics (ons.gov.uk).

13.12.41. An individual is disabled under the Equality Act 2010 if they have a physical or mental impairment that has a 'substantial' and 'long-term' negative effect on their ability to do normal activities.

13.12.42. Table 13-22 indicates that the proportion of individuals that are disabled whose day-to-day activities are limited a lot and individuals with a long-term physical or mental health condition are higher in Badgeworth and Springbank, than the national average and other wards within the study area. This reflects the data from Table 13-21 where there are higher levels of bad and very bad health.

Table 13-23 – Baseline conditions – Human health: Average life expectancy from birth [31]

Location	**Male**	**Female**
Badgeworth	79.5	81.5
Severn Vale North	79.5	84.3
Severn Vale South	83.3	89.4
Springbank	78.1	80.6
St. Peter's	77.6	83.7
Swindon Village	83.5	84.0
England	79.5	83.2

Average life expectancy between 2016 – 2020 (Wards) and between 2021/22 – 2022/23 (England)

13.12.43. Table 13-23 displays the average life expectancy from birth of the local population by ward. The figures indicate that life expectancy for both males and females is generally above the national averages. However, average life expectancy for both males and females are below the national life expectancy in Springbank, average life expectancy for females in Badgeworth and for males in St. Peters is also below the national average.

Table 13-24 – Baseline conditions – Human health: Mortality by respiratory diseases (MLSOA)[32]

Location	2017	2018	2019	2020
E02004600: Cheltenham 001	0%	20.0%	15.6%	10.6%
E02004602: Cheltenham 003	13.2%	15.9%	14.7%	26.6%
E02004604: Cheltenham 005	9.7%	13.3%	12.8%	15.0%
E02004606: Cheltenham 007	15.1%	13.3%	9.2%	22.6%
E02004669: Tewkesbury 004	16.9%	8.6%	6.5%	20.0%
E02004673 Tewkesbury 008	12.5%	5.8%	23.6%	19.1%
England	13.1%	13.4%	12.9%	21.8%

13.12.44. Table 13-24 displays the proportion of the population by Middle Layer Super Output Areas (MLSOA) who died as a result of respiratory diseases. There are six MLSOAs within the study area, as displayed in Figure 13-11. This data was not available at ward level. The respiratory diseases referred to include the following: acute respiratory disease, chronic

[31] OHID 2023. Available at: Public health profiles - OHID (phe.org.uk)
[32] ONS 2021. Available at: www.nomisweb.co.uk.

lower respiratory diseases; influenza and pneumonia; pulmonary oedema and other intestinal pulmonary disease; respiratory failure, tuberculosis, and COVID-19.

Figure 13-11 - Middle layer super output areas within the study area

Figure provided in Appendix 13.1 (application document TR010063/APP/6.15)

13.12.45. Table 13-24 are fairly inconclusive in terms of any trends, although it can be asserted that E02004604: Cheltenham 005, which covers the north-eastern section of Springbank and north-western section of St Peter's ward, had a lower proportion of the population who died as a result of respiratory diseases between 2017 to 2020 than the national average. Furthermore, the proportion of people who died as a result of respiratory diseases between 2018 to 2020 were generally unfavourable in E02004602: Cheltenham 003 which covers the western section of Springbank ward, which includes part of the B4634.

13.12.46. Overall, the six tables indicate that although the population has a high number of under 16s and over 65s, this is not reflected in any perceived susceptibility to health issues. However, Badgeworth ward has generally unfavourable health statistics when compared to the other wards.

Local Insight profile data

Table 13-25 – Population: Ethnicity[33]

Ward	% White British	% White-non-British	% Mixed	% Asian	% Black	% Other ethnic group
Badgeworth	92.5	3.3	1.7	1.7	0.4	1.0
Severn Vale North	93.7	3.5	1.2	1.0	0.4	0.2
Severn Vale South	91.7	4.0	1.2	2.5	0.2	0.6
Springbank	79.0	12.2	2.2	4.5	1.2	1.0
St. Peter's	74.3	12.6	3.2	6.9	1.4	1.6
Swindon Village	81.4	7.9	2.1	6.6	1.0	1.0
England	73.6	7.5	2.9	9.6	4.2	2.2

13.12.47. Table 13-25 displays the varying ethnicities within the study area by ward, based on each person's perceived ethnic group and cultural background. The figures show that across all wards the percentage of ward's population of a White-British ethnicity is significantly higher when compared to all other ethnicities. The percentage of White-British across all wards is above the national average (73.6%). Severn Vale North ward has the highest percentage of people of a White-British ethnicity (93.7%).

13.12.48. St Peter's ward has the lowest percentage of people of a White British ethnicity (74.3%) and the highest percentage of people of a White-non-British, Mixed, Asian, Black, and Other ethnicities when compared to all other wards within the study area.

[33] ONS 2021 Census. Available at: Census - Office for National Statistics (ons.gov.uk).

Table 13-26 – Population: Country of birth[34]

Ward	% Born in England	% Born Outside the UK	% With a UK passport	% With a non-UK passport	% With no passport held
Badgeworth	94.1	5.9	84.4	2.6	13.0
Severn Vale North	95.0	5.0	83.3	2.9	13.8
Severn Vale South	92.6	7.4	85.6	3.4	11.0
Springbank	82.4	17.6	67.0	13.3	19.8
St. Peter's	78.9	21.1	70.1	15.5	14.4
Swindon Village	84.5	15.5	74.8	9.7	15.5
England	82.6	17.4	76.6	10.2	13.2

13.12.49. Table 13-26 shows the percentage of people within the study area who were born within or outside of the UK, as well as those who possess a UK passport or non-UK passport. The figures show that across all wards the percentage of people within the study area born in England is above the national average (82.6%), with the exception of residents in St Peters (78.9%) and Springbank (82.4%). In St Peter's the percentage of persons born outside of the UK and with a non-UK passport is above the national average and above the proportion in all other wards.

Table 13-27 – Population: Household Composition [35]

Ward	% One person households (aged 66 and over)	% One-person household: Other	Single family couple household: No children	Single family couple household: Dependent children	Single family couple household: Non-dependent children	Single family: Lone parent household	Other household type
Badgeworth	7.2	5.3	17.2	33.3	8.2	10.2	18.6
Severn Vale North	3.9	4.2	18.6	34.8	9.9	6.9	21.6
Severn Vale South	4.4	5.9	22.5	24.3	10.8	4.1	28.0
Springbank	4.8	7.5	15.3	33.4	7.2	15.5	16.3
St. Peter's	4.4	11.6	19.6	28.4	5.1	10.8	20.0
Swindon Village	5.7	8.3	17.4	30.0	10.0	10.8	17.8

[34] ONS 2021 Census. Available at: Census - Office for National Statistics (ons.gov.uk).
[35] ONS 2021 Census. Available at: Census - Office for National Statistics (ons.gov.uk)

England	12.8	17.3	16.8	18.9	6.3	11.1	16.9

13.12.50. Table 13-27 shows the composition of household types in the study area by ward. The percentage of one person households aged 66 is lower than the national average (12.8%) across all wards within the study area, with the highest proportion in Badgeworth (7.2%).

13.12.51. When compared to all other wards St Peter's have the highest percentage of one person households which are also higher than the national averages.

13.12.52. Severn Vale South has the lowest proportion of family households with no children and lowest proportion of lone parent households.

13.12.53. All wards have a higher proportion of families with dependent children than the national average with the highest proportions in Severn Vale North (34.8%), Badgeworth (34.3%) and Springbank (33.4%). Springbank also has the highest proportion of lone parent families with dependent children (15.5%) when compared to all other wards and is the only ward with a higher proportion than the national average (11.1%).

Table 13-28 – Vulnerable groups: People out of work[36]

Ward	% Unemployment Benefit (JSA and UC) claimants (May-22)	% Youth unemployment (JSA/UC) claimants aged 18-24) (May-22)	% Older unemployed (JSA/UC claimants aged 50+) (May-22)	% Male unemployment claimants (JSA and UC) (May-22)	% Female unemployment claimants (JSA and UC) (May-22)	% Working age workless benefit claimants (Nov-21)	% Incapacity benefits claimants (Nov-21)
Badgeworth	1.7	3.6	0.6	1.1	1.6	4.7	2.7
Severn Vale North	1.4	0.0	0.5	1.4	1.2	3.4	1.8
Severn Vale South	1.9	2.2	0.6	2.0	1.8	5	3
Springbank	3.4	6.4	1.1	3.5	3.7	8.8	4.4
St. Peter's	3.5	3.3	1.5	4.4	2.6	7.8	3.3
Swindon Village	2.6	1.7	1.3	3.0	2.0	8.6	4.4
England	4.0	4.6	1.6	4.7	3.3	8.9	4.2

13.12.54. Table 13-28 displays the percentages of people who are out of work and receiving workless benefits: Jobseekers Allowance (JSA)/Universal Credit (UC) and Incapacity Benefit (IB)/Employment and Support Allowance (ESA) within the study area.

13.12.55. The percentage of people receiving unemployment benefit claimants, older unemployment claimants and female unemployment claimants is highest in St Peter's when compared to all other wards, however, the proportions are lower than the national averages.

13.12.56. In Springbank, the proportion of youth unemployment claimants is higher than all other wards and above the national average. The proportion of male unemployment, working

[36] Department for Work and Pensions. 2022. Available at: Statistics at DWP - Department for Work and Pensions - GOV.UK (www.gov.uk)

age workless and incapacity benefit claimants are also higher in Springbank when compared to all other wards.

Table 13-29 – Vulnerable groups: Disability[37]

Ward	% Attendance Allowance claimants (Nov-21)	% Personal Independence Payment (PIP) (Apr-22)	% PIP Males (Apr-22)	% PIP Females (Apr-22)	% PIP with mental health conditions (Apr-22)	% PIP with respiratory disease (Apr-22)	% Households on Universal Credit - Limited Capability for Work Entitlement (Feb-22)	% Disability Living Allowance claimants (Nov-21)
Badgeworth	10.2	6.1	3.9	6.4	1.9	0.3	3.8	2.4
Severn Vale North	6.8	4.4	2.6	6.6	0.6	0.6	4.6	2.0
Severn Vale South	9.8	3.6	3.2	4	1.2	0.6	3.2	1.6
Springbank	10.9	7.7	6.6	7.9	2.4	0.1	4.0	2.6
St. Peter's	13.4	5.1	3.5	6.1	1.9	0.1	4.0	1.8
Swindon Village	9.4	6.7	6.1	5.9	1.6	0.3	3.2	1.9
England	11.4	7.0	6.4	7.6	2.5	0.3	3.0	2.0

13.12.57. Table 13-29 displays the prevalence of disability among people living within the study area by ward. The percentage of pensioners with disabilities receiving attendance allowance claimants is higher than the national average (11.4%) and higher than all other wards in St Peter's (13.4%).

13.12.58. Across all wards the percentage of the population receiving personal independence payments (PIP) to support everyday life is lower than the national average, except for in Springbank. The percentage of PIP Males and Females is also higher in Springbank than the national average and across other wards.

13.12.59. The percentage of population receiving PIP with mental health issues is lower than the national average across all wards. Springbank has the highest percentage and Severn Vale South has the lowest percentage of PIP with mental health issues when compared to all other wards.

13.12.60. However, the percentage of population receiving PIP with respiratory disease is higher in Severn Vale North and Severn Vale South when compared to all other wards and these are the only wards above the national average.

13.12.61. Badgeworth and Springbank have a higher percentage of the population receiving Disability Allowance claimants than the national average.

[37] Department for Work and Pensions. 2022. Available at: Statistics at DWP - Department for Work and Pensions - GOV.UK (www.gov.uk)

Table 13-30 – Vulnerable groups: Children[38]

Ward	% Children in relative low income families	% Children in absolute low income families	% Children in relative low income lone parent families	% Children in relative low income out of work families
Badgeworth	12.0	10.6	32.3	8.1
Severn Vale North	12.0	10.0	71.4	51.9
Severn Vale South	12.0	11.2	28.9	0.0
Springbank	18.3	15.1	42.3	23.7
St. Peter's	16.2	13.6	39.4	19.7
Swindon Village	17.4	13.0	31.0	26.1
England	18.7	15.4	40.2	30.6

13.12.62. Table 13-30 shows the extent of children in low-income families, out of work households and lone parent households within the study area by ward. The percentage of children in relative and absolute low-income families across all wards is lower than the national averages. However, the percentage of children in relative and absolute low-income families is highest when compared to all other wards in Springbank.

13.12.63. In Severn Vale North the percentage of children in relative low income out of work families is higher than all other wards and significantly above the national average. In addition, the percentage of children in relative low-income lone parent families is significantly high in Severn Vale North (71.4%) and higher than the national average (40.2%), in addition to those in Springbank.

Table 13-31 – Vulnerable groups: Pensioners[39]

Ward	% Private pensioner households with no car or van (Census 2011)	% State pension claimant (DWP Nov-20)	% Pension credit claimant (DWP Nov-21)
Badgeworth	11.2	87.9	9.1
Severn Vale North	12.0	71.4	51.9
Severn Vale South	5.3	89.9	8.2
Springbank	31.7	92.0	16.6
St. Peter's	35.5	91.0	13.3
Swindon Village	25.0	90.5	9.6

[38] Department for Work and Pensions. 2020. Available at: Statistics at DWP - Department for Work and Pensions - GOV.UK (www.gov.uk)
[39] Department for Work and Pensions. 2020. Available at: Statistics at DWP - Department for Work and Pensions - GOV.UK (www.gov.uk)

Ward	% Private pensioner households with no car or van (Census 2011)	% State pension claimant (DWP Nov-20)	% Pension credit claimant (DWP Nov-21)
England	40.8	92.5	11.5

13.12.64. Table 13-31 shows the extent of pensioner groups within the study area including those that may face greater risks or who may have different types of need. There are two measures included: pensioners without access to transport and pensioners in poverty. Pensioner loneliness (i.e. one person households (aged 66 and over) is covered in Table 13-27.

13.12.65. The percentage of pensioners without household access to a car or van is lower than the national average across all wards. The ward with the highest percentage of pensioners without a car is St Peter's (35.5%).

13.12.66. Notably the percentage of pension credit claimants in Severn Vale North is significantly higher than all other wards and the national average, whilst the percentage of state pension claimants in Severn Vale North is the lowest when compared to all other wards.

13.12.67. The percentage of state pension claimants is lower than the national average in Badgeworth, Severn Vale North and Severn Vale South.

Table 13-32 – Vulnerable groups: Households with multiple needs[40]

Ward	% Household is not deprived in any dimension	% Household is deprived in 1 dimension	% Household is deprived in 2 dimensions	% Household is deprived in 3 dimensions	% Household is deprived in 4 dimensions
Badgeworth	57.2	30.0	9.9	2.8	0.0
Severn Vale North	58.3	30.3	9.1	1.8	0.4
Severn Vale South	55.4	32.5	10.1	1.9	0.2
Springbank	48.6	34.0	13.3	3.6	0.5
St. Peter's	53.9	31.9	11.5	2.5	0.2
Swindon Village	53.2	30.0	12.3	3.3	0.2
England	49.4	32.8	13.8	3.7	0.2

13.12.68. Table 13-32 displays the proportion of the households by levels of deprivation dimensions. The dimensions of deprivation that are used to classify households are indicators based on the four selected household characteristics. A household is deprived in a dimension if they meet one or more of the following conditions:

- Employment: any member of a household not a full-time student is either unemployed or long-term sick,
- Education: no person in the household has at least level 2 education, and no person aged 16-18 is a full-time student,

[40] ONS 2021 Census. Available at: Census - Office for National Statistics (ons.gov.uk)

- Health and disability: any person in the household has general health 'bad or very bad' or has a long-term health problem, and
- Housing: Household's accommodation is ether overcrowded, with an occupancy rating -1 or less, or is in a shared residential property, or has no central heating.

13.12.69. Table 13-32 shows the percentage of households within the study area that experience deprivation, based on the four Census 2021 deprivation dimensions. The figures indicate that Springbank has the lower percentage of households not deprived in any dimension when compared to all other wards and the only ward below the national average.

13.12.70. The percentage of households deprived in three dimensions, or four dimensions of deprivation is higher in Springbank when compared to all other wards, across all wards is lower than the national average, except for in Springbank, in which the percentage of households deprived in four dimensions is above the national average.

13.12.71. The higher levels of deprivation in Springbank are likely to contribute to fewer years in good health and result in a shorter life expectancy in Springbank, as indicated in Table 13-22.

Table 13-33 – Vulnerable groups: Other groups[41]

Ward	% Mental health related benefits (DWP Nov-21)	% People providing unpaid care (Census 2021)	% Unpaid care (50+ hours per week) (Census 2021)
Badgeworth	1.2	8.3	2.4
Severn Vale North	0.9	8.7	2.5
Severn Vale South	1.4	9.5	2.7
Springbank	2.2	7.2	2.3
St. Peter's	2.1	6.2	1.6
Swindon Village	2.3	7.7	2.4
England	2.1	8.5	2.6

13.12.72. Table 13-33 shows the percentages the population within the study area who are considered to be classified as vulnerable groups. These are considered as those who experience mental health issues and those who are providing unpaid care.

13.12.73. The percentage of people with mental health issues is similar across wards, with the percentage in Badgeworth (1.2%), Severn Vale North (0.9%) and Severn Vale South (1.4%) lower than other wards in the study area and the national average (2.1%).

13.12.74. The percentage of unpaid care (50+ hours per a week) is similar across wards, except for in St. Peter's (1.6%) in which unpaid care is notably lower than the national average and other wards. The percentage of people providing unpaid care is lower than the national average in St Peter's, Springbank and Swindon Village.

[41] ONS 2011 Census. Available at: www.nomisweb.co.uk.

Table 13-34 – Housing: Population density[42], central heating[43], household overcrowding[44] and dwelling size[45]

Ward	Population density (persons / hectare) (ONS 2016)	% Houses lacking central heating (Census 2021)	% Over-crowded Housing (Census 2011)	% Dwellings with 2 bedrooms or fewer (Census 2021)	% Dwellings with 4 or more bedrooms (Census 2021)
Badgeworth	1.2	1.0	2.9	25.4	37.7
Severn Vale North	0.7	0.5	3.5	21.8	46.0
Severn Vale South	0.7	1.8	4.2	27.4	42.6
Springbank	34.5	1.3	5.5	36.4	11.0
St. Peter's	50.3	1.2	13.2	53.7	12.0
Swindon Village	10.5	2.0	7.1	33.8	14.2
England	4.3	1.5	8.7	38.9	21.1

13.12.75. Table 13-34 displays the indicators of the built environment: overcrowded housing, population density, the size of housing units and the proportion of households lacking central heating.

13.12.76. The figures indicate that the percentage of housing lacking central heating in Seven Vale North and Swindon Village is higher than the national average (1.5%). Population density is higher than the national average in Springbank, Swindon Village and St Peter's. Notably the population density (50.3 persons per hectare) and in turn the percentage of overcrowded housing (13.2%) is highest in St Peter's when compared to all wards, which is also significantly higher than the national average.

Table 13-35 – Health and wellbeing: General health[46]

Ward	% People living in health deprivation 'hotspots' (most deprived 20% of areas) (Indices of Multiple Deprivation 2019)	% Babies born with a low birth weight (ONS 2011-2015)
Badgeworth	0.0	3.8
Severn Vale North	0.0	0.0
Severn Vale South	0.0	2.0
Springbank	0.0	1.4
St. Peter's	0.0	4.2
Swindon Village	25.4	4.8
England	19.6	2.8

[42] Population density data – Office for National Statistics (ONS) 2016. Available at: www.nomisweb.co.uk
[43] ONS 2021 Census. Available at: Census - Office for National Statistics (ons.gov.uk).
[44] ONS 2011 Census. Available at: www.nomisweb.co.uk.
[45] ONS 2021 Census. Available at: Census - Office for National Statistics (ons.gov.uk).
[46] Indices of Deprivation 2019

13.12.77. Table 13-35 shows that there are no health deprivation hotspots present in all wards within the study area expect for in Swindon Village, in which 25.4% of people live in a neighbourhood with poor levels of overall health, a figure higher than the national average (19.6%).

13.12.78. The percentage of babies born with a low birth weight is higher than the national average (2.8%) in Badgeworth (3.8%), St Peters (4.2%) and Swindon Village (4.8%).

Table 13-36 – Health and wellbeing: Hospital admissions[47]

Ward	Emergency hospital admissions for children under 5 (per 1,000 population)	A&E attendance for children under 5 (per 1,000 population)
Badgeworth	248	441
Severn Vale North	180	347
Severn Vale South	217	401
Springbank	196	398
St. Peters	187	381
Swindon Village	171	393
England	162	630

13.12.79. Table 13-36 shows the rate of emergency hospital admissions and A&E attendances for children (aged under 5 years) per 1,000 resident population in the study area by ward.

13.12.80. The figures show that emergency hospital admissions for children under the age of five years old is higher than the national average across all wards. The A&E attendance for children under the age of five is lower per 1,000 persons across all wards than the national average. The percentage of emergency hospital admissions and A&E attendance for children under five years of age is highest in Badgeworth when compared to all other wards in the study area.

Table 13-37 – Health and wellbeing: Musculoskeletal conditions[48]

Ward	% people with knee osteoarthritis	% people with hip osteoarthritis	% people with back pain	% people with severe knee osteoarthritis	% people with severe hip osteoarthritis	% people with severe back pain
Badgeworth	17.9	11.3	19.8	5.7	3.1	12.6
Churchdown St. Johns	18.3	11.1	17.7	5.7	3.1	11
Severn Vale North	17.7	10.6	17.8	5.4	3.0	10.4
Severn Vale South	17.9	10.8	20	5.6	3.1	11.9

[47] Hospital Episode Statistics, Information Centre for Health and Social Care, Office for National Statistics (2017/2018 - 2019/2020) Available at: www.nomisweb.co.uk.
[48] Versus Arthritis UK. 2011.

Springbank	16.7	10.4	15.9	5.1	2.8	10.2
St. Peters	17	10.3	15.1	4.9	2.6	9.0
Swindon Village	17	10.1	16.6	5.1	2.6	9.8
England	18.2	10.9	16.9	6.1	3.2	10.3

13.12.81. Table 13-37 displays the prevalence of those suffering from musculoskeletal conditions in the study area by ward. Table 13-37 indicates that the percentage of people with musculoskeletal conditions is similar between wards and when compared to the national averages. However, the percentage of populations with back pain and severe back pain are highest in Badgeworth (19.8% and 12.6%) and Severn Vale South (20% and 11.9%) and higher than the national averages (16.9% and 10.3%).

Table 13-38 – Health and wellbeing: Consumption of 5+ fruit & veg a day, binge drinking and smoking [49]

Ward	Healthy eating (% of total population)	Binge drinking (% of total population)	Smoking (% of total population)
Badgeworth	33.6	15.6	19.1
Severn Vale North	37.4	18.9	12.7
Severn Vale South	34.7	19.5	15.5
Springbank	22.0	24.0	37.8
St. Peter's	25.5	27.0	32.4
Swindon Village	26.3	24.1	30.0
England	28.7	20.0	22.2

13.12.82. Table 13-38 shows the lifestyle behaviours of people living in the study area by ward. Lifestyle behaviours are risk factors which play a major part in an individual's health outcomes. The data shows the healthy eating levels (consumption of five or more portions of fruit and vegetables a day among adults), smoking prevalence and levels of binge drinking in the seven wards within the study area.

13.12.83. The figures show the proportion of people eating healthily is below the national average in Springbank, St. Peter's and Swindon Village. The proportion of binge drinking and smoking in Springbank, St Peter's and Swindon Village is higher than all other wards and greater than the national average. The populations in Badgeworth, Severn Vale North and Severn Vale South have healthier lifestyle habits than other wards and then the national average.

[49] Health Survey for England 2006-2008. Available at: Health Survey for England - 2006: Latest trends - NHS Digital. [Accessed on 22/11/2022]

Table 13-39 – Health and wellbeing: Children and adults classified as obese[50]

Ward	% Children (reception year)	% Children (year 6)	% Adults
Badgeworth	10.9	25.0	25.1
Severn Vale North	9.8	16.7	22.6
Severn Vale South	9.2	19.1	23.9
Springbank	12.8	22.9	29.1
St. Peter's	12.7	23.0	24.4
Swindon Village	10.4	18.6	25.9
England	9.7	20.4	24.1

13.12.84. Table 13-39 shows the percentage of children (in reception year and year 6) classified as overweight or obese in the study area.

13.12.85. The figures show that the percentage of overweight children (reception year) across all wards is higher than the national average, except for in Severn Vale South in which the percentage of overweight children is slightly lower than the average. The percentage of overweight children (year 6) is higher than the national average (20.4%) in Badgeworth (25.0%), Springbank (22.9%) and St Peter's (23.0%) wards. Adult obesity is above the national average in all wards except for within Severn Vale South. Springbank has the highest percentage of adults with obesity.

Table 13-40 – Health and wellbeing: Physical activity among adults[51]

Ward	% Physically active	% Physically inactive	% Physically active two times a month
Badgeworth	65	21	81
Severn Vale North	70	18	84
Severn Vale South	68	20	83
Springbank	64	24	77
St. Peter's	69	20	82
Swindon Village	65	22	80
England	64	23	79

13.12.86. Table 13-40 shows estimates of the levels of physical activity among adults within the study area. The categories are defined as:

- **Physically active**: undertaking at least 150 minutes per week in the past month excluding gardening.
- **Physically inactive**: undertaking less than 30 minutes per week in the past month excluding gardening.
- **Physical activity at least twice a month**: undertaking physical activity on at least two occasions in the past month.

[50] National Child Measurement Programme (NCMP) (2017/18-2019/20), Health Survey for England 2006-2008. Available at: Health Survey for England - 2006: Latest trends - NHS Digital.
[51] Sport England. Active Lives Survey 2020 – small area data 2018/2019.

13.12.87. Across all wards the percentage of physically active adults is the same as or higher than the national average.

13.12.88. Similarly, the percentage of adults physically active two times a month is higher than the national average across all wards except for in Springbank. In Springbank, the percentage of physically inactive adults is higher when compared to all other wards, whilst the percentage of physically active adults in Springbank is lower than all other wards. Meanwhile, the percentage of adults physically active is greatest in Severn Vale North.

Table 13-41 – Health and wellbeing: General health and limiting long-term illness[52]

Ward	AHAH Retail Environment domain	AHAH Health Services domain	AHAH Physical Environment domain	AHAH Air quality domain	AHAH Index
Badgeworth	4.3	45.7	46.8	10.1	26.7
Severn Vale North	2.8	53.4	57.6	8.8	30.6
Severn Vale South	3.4	49.5	54.4	9.1	29.1
Springbank	9.9	15.9	24.1	13.7	15.9
St. Peter's	30.1	8.1	24.1	14.1	19.1
Swindon Village	21.3	12.0	29.4	12.2	18.8
England	23.4	20.1	21.3	26.8	22.9

13.12.89. Table 13-41 shows data relating to the index of 'Access to Health Assets and Hazards' (AHAH) Version 2, a multidimensional index produced by the Consumer Data Research Centre (CDRC) that measures how 'healthy' neighbourhoods are by looking at accessibility and geographical determinants of health. The AHAH index combines indicators under four different domains of accessibility:

- Retail environment (access to fast food outlets, pubs, off-licences, tobacconists, gambling outlets)(Health hazard).
- Health services (access to GPs, hospitals, pharmacies, dentists, leisure services) (Health asset).
- Physical environment (Blue Space, Green Space) (Health asset).
- Air quality (Nitrogen Dioxide, Particulate Matter 10, Sulphur Dioxide) (Health hazard).

13.12.90. The figures show that access to a retail environment which can negatively affect an individual's health is highest in St Peter's and out of all wards is higher than the national average, whilst the lowest level of retail access is in Seven Vale South when compared to all other wards. The level of health service access is lower than the national average in Swindon Village and St Peter's. Across all wards air quality is of a better quality than that of the national average. The poorest air quality when compared to all wards is in St Peter's.

13.12.91. Severn Vale North, Severn Vale South and Badgeworth have the highest levels of access to health services and physical environment when compared to all other wards and the national averages. Furthermore, Severn Vale North, Severn Vale South and Badgeworth

[52] CDRC (2017)

have the higher AHAH index than the national average and higher index than all other wards.

Table 13-42 – Access and transport: Distance and travel times to key services[53]

Ward	Average road distance from Job Centre (km)	Average road distance from Secondary School (km)	Average road distance from GP (km)	Average road distance from Pub (km)	Average road distance from Post Office (km)	Job Access Score (2021)
Badgeworth	7.3	2.6	3	1.6	2.5	670717.6
Churchdown St. Johns	5.8	1.4	0.9	0.9	0.9	464292.9
Severn Vale North	6.7	7.1	6	0.9	5.8	520489.8
Severn Vale South	5.9	3.9	3.6	1.3	3.5	520661.7
Springbank	3.8	1	0.7	2	0.8	526603.3
St. Peters	1.9	1.8	0.8	0.8	1	434576.0
Swindon Village	2.4	2.1	1.8	1.6	1.2	468986.5
England	4.6	2.1	1.2	0.7	1	698519.5

13.12.92. Table 13-42 details the accessibility of key services and amenities to people living within the study area. Accessibility is measured both in terms of distance and travel times to key services.

13.12.93. Table 13-42 shows that the shortest average distance from a secondary school, GP and a pub is in Springbank when compared to all other wards. In Severn Vale North, the average distance from a secondary school and a GP is higher than the national average and when compared to all other wards.

13.12.94. The job access score across all wards is lower than the national average, however Badgeworth has the highest job access score when compared to all other wards.

Table 13-43 – Access and transport: Killed or seriously injured (KSI)[54]

Ward	2019/20	2020/21	2021/22
Badgeworth	8	7	8
Severn Vale North	3	5	1
Severn Vale South	3	3	11
Springbank	0	0	1
St. Peter's	5	2	6
Swindon Village	2	3	4

[53] Road distances - Commission for Rural Communities: Distance to Service dataset (2010); UK Onward (2021)
[54] GCC Data and Analysis Road Safety

13.12.95. Table 13-43 shows the annual road safety totals for casualties and collisions in the study area for three years. The figures in Table 13-43 are inconclusive with KSIs generally consistent between years. Notably, there was a significant increase in KSI's in 2021/22 in Severn Vale South. The KSI rate in Severn Vale South is higher than all KSIs between 2019/20 – 2021/22, whilst Springbank has the lowest KSI rate between 2019/20 – 2021/22 when compared to all other wards.

Table 13-44 – Communities and environment: Green space coverage[55]

Ward	% Total green space	% Public parks and gardens greenspace
Badgeworth	1.5	1.17
Severn Vale North	1.0	0.14
Severn Vale South	1.0	0.0
Springbank	6.5	0.0
St. Peter's	3.2	0.71
Swindon Village	3.6	0.08
England	2.2	0.8

13.12.96. Table 13-44 shows the extent of green spaces that are likely to be accessible to the public within the study area. The data includes allotments or community growing spaces, bowling greens, cemeteries, religious grounds, golf courses, other sports facilities, play spaces, playing fields, public parks or gardens and tennis courts.

13.12.97. The percentage of total green space in Badgeworth, Severn Vale North and Severn Vale South is lower than the national average. Whilst the percentage of accessible parks and greenspaces is lower than the national average across all wards except for in Badgeworth.

Table 13-45 – Communities and environment: Community Needs Index[56]

Ward	Community Needs Score	Civic Assets score	Connectedness score	Active and engaged community score
Badgeworth	15.5	2.0	6.6	6.9
Severn Vale North	34.9	18.6	10.4	5.9
Severn Vale South	28.5	10.4	10.5	7.7
Springbank	149.5	52.2	1.0	96.3
St. Peter's	40.5	1.5	3.4	35.5
Swindon Village	78.0	7.3	1.8	69.0

[55] OS data © Crown copyright and database right 2017
[56] Oxford Consultants for Social Inclusion (OCSI) and Local Trust. 2019.

Ward	Community Needs Score	Civic Assets score	Connectedness score	Active and engaged community score
England	68.4	23.2	21.3	23.9

13.12.98. Table 13-45 details the scores by ward relating to the Community Needs Index. This was developed to identify areas experiencing poor community and civic infrastructure, relative isolation and low levels of participation in community life.

13.12.99. The index was created by combining a series of 19 indicators, conceptualised under three domains: Civic Assets, Connectedness and Active and Engaged Community. A high score indicates that the area has high levels of need.

13.12.100. The figures show that Springbank has a significantly higher community needs score when compared to all other wards and the national average. Springbank has a highest need for civic assets and the highest level of barriers to participation and engagement in the community. However, Springbank has the highest level of connectedness / accessibility to key services when compared to all other wards.

13.12.101. The table shows that Badgeworth consistently has a low-level score, with the lowest level of community need and low levels of civic asset needs, community connectedness and an active and engaged community.

Health receptor identification and sensitivity within the study area

13.12.102. The identification of human health receptors for this assessment has been undertaken with reference to the standard in DMRB LA112, as well as IEMA guidance on scoping health in EIA and assigning significance.

13.12.103. From a review of the population and human health baseline for CBC and TBC as a whole, as well as data from within these areas (e.g. ward level data and LSOA), it has been possible to identify a number of groups within the population and communities of study area, who, along with the population as a whole (wider groups) could be considered vulnerable in terms of their health and wellbeing. These groups and the rationale for their identification is outlined in Table 13-48, which takes each of the population groups and sub-groups identified within the DMRB LA112 standard and cross-references them against the types of receptors that they may be represented amongst. An explanation of this link between population and receptor is provided and then baseline data is used to confirm to what extent each population group is present within the human health study area.

13.12.104. Table 13-47 has been developed following the confirmation of the population types represented within the study area. It lists each receptor that has been considered within the human health assessment and assigns a level of sensitivity to change. The sensitivity category is based on a review of data relating to the six factors noted in the IEMA guidance (at 7.9 and reflected in the methodology in this chapter) as relevant to receptor sensitivity. There are five broad receptor types that have been considered:

- Study area wider population – this reflects the population as a whole.
- Study area sub-populations – these are groups present as sub-sets of the wider population that share protected characteristics or form groups with particular sensitivities to changes in health determinants.
- Geographic sub-populations – this reflects members of the study area wider population that are likely to experience a specific set of impacts to determinants of health from the Scheme, due to their location within the study area.
- Community assets that support human health – for example emergency services, healthcare, education, recreation, and leisure assets.
- Employment and training assets – for example, schools and vocational training venues.

Table 13-46 – Human health population typologies and representation in the study area

Group	Relevant receptor / medium	Explanation	Are these groups identified in the study area
Wider groups – adults / working people	Residents living in houses, operators and users of community land and facilities, business owners and users, users of open space, recreation, and leisure activities, WCH, public transport users and vehicle travellers	The key challenge to the physical health, mental and social wellbeing of the local resident population arises from inactivity and unhealthy lifestyle choices and are also linked to the local transportation and road network. Residents of properties in the study area, employees and customers at the retail, commercial and industrial businesses interspersed throughout the area, walkers and cyclists using recreation routes and the local footpath and cycleway network, visitors to nearby visitor attractions, and public transport users are likely to be most exposed to health impacts.	**Yes:** There are >23,500 existing and proposed (comprising RFFPs) residential properties within the study area. There are also a number of existing businesses and business locations within the study area (as outlined in Table 13-4), as well as planned employment growth (RFFPs) totalling c. 68 hectares.
Sensitive Group – Families with children and adolescents (pregnant women, babies, children, and adolescents)	Residential houses, community services and facilities, open space, greenspace and recreational facilities, PRoW, local footpaths and cycleways, schools, nurseries, day care centres	Children and adolescents constitute a sensitive population group due partly to their need to be able to move around freely to and from school, open space, greenspace, and recreational activities, whilst they lack the experience and judgement displayed by adults when moving around in traffic and public spaces and when using public transport and related infrastructure. Hence, children and adolescents as pedestrians and cyclists are at elevated risk from danger distributed by motorised transport. Furthermore, children are more sensitive than adults to air pollution, noise, odour and other environmental factors and their bodies and minds are less able to deal with them. Particularly susceptible children are those from low-income and/or black and minority ethnic (BME) backgrounds and/or living in deprived areas.	**Yes:** There are households with children present within the study area. Between all wards in the study area, Springbank has the highest proportion of children aged between 0-15 years. Springbank also has the highest proportion of lone parent families (15.5%) when compared to all other wards and is the only ward with a higher proportion than the national average (11.1%). Child (year 6) obesity is above the national average in Badgeworth, Springbank and St Peter's wards. The percentage of babies born with a low birth weight is higher than the national average (2.8%) in Badgeworth (3.8%), St Peters (4.2%) and Swindon Village (4.8%). Children emergency admissions to hospital are notably higher than the national average across all wards. The General Fertility Rate (57.9) and Total Fertility Rate (1.66) in the Tewkesbury area is higher than that of the England average (53.6 and 1.59

Group	Relevant receptor / medium	Explanation	Are these groups identified in the study area
			respectively), indicating higher average rates of pregnancy.
Sensitive Group – People who are physically or mentally disadvantaged (elderly people, people with physical disabilities, people with other health problems or impairments)	Residential houses, retirement / Care homes, community services and facilities (including health centres / clinics and hospitals), open space, PRoW and local footpaths	Elderly people constitute a sensitive group as they are more sensitive than young and middle-aged adults. Generally, the older people are, the slower their movement and reactions and the poorer their hearing. They can be more at risk from injury and may fear falls, steps or lack of suitable footpaths, lack of safe crossing points and short crossing times at safe crossing points and other aspects of the surrounding built environment. This can deter them from outdoor activity, especially walking, whereas walking is critical for muscle strength and reduces the risk of falls amongst other benefits. Elderly people can also feel more sensitive when using public transport. They also often need to seek health services. Their continuing independence at home is often dependent on having available a range of transport modes and route options. People who are disabled and/or with physical and/or mental illnesses or impairments constitute a sensitive group as they may not be able to access many forms of transport or need special arrangements and/or support to access these. They are more likely to find it difficult to walk or travel independently and can also be disadvantaged by the cost of transport. Any changes in access, such as greater travel distances, diversions or replacement services during construction would have particular impacts on this group. Chronically ill persons, for example, people with impaired lung function, can be more adversely affected by air pollution. The same is true of hypersensitive individuals such as asthmatics. Noise can cause hypertension and cardio-vascular problems. Those who already have these conditions can be more troubled by noise than others. People with	**Yes:** There are care facilities within the study area, including an assisted living residential home for those with disabilities, care home for those aged 65 and over; and a dementia-only care home. The population within the study area is predominantly ageing, with an older population than the national average. Obesity is also a notable issue for the majority of the study area with most wards recording above national average statistics across age groups. Within the study area, Badgeworth and Severn Vale South wards have the highest proportion of people aged 65 years or above and the lowest proportions of children aged 0-15 years. Badgeworth also has the highest percentage of one person pensioner (aged 66 and over) households, above that of the national average. Badgeworth and Severn Vale South populations have higher percentages of back and severe back pain when compared to other wards in the study area. Badgeworth (17.5%) and Springbank (17.6%) wards have the highest percentage of disabled individuals whose day-to day activities are “limited a lot” and “limited a little”. Badgeworth also has the highest percentage of individuals who are not disabled but have a long term physical or mental health condition but day to day activities are not limited (8.8%) when compared to all wards. The percentage of people with mental health issues is similar across wards, with proportions similar to or below the national average.

Group	Relevant receptor / medium	Explanation	Are these groups identified in the study area
		existing physical and mental illnesses, including sleep disturbance, anxiety, and depression, are likely to be more sensitive to changes to their local environment.	Generally, health issues related to diseases is not prevalent within the study area.
Sensitive Group – People who are materially disadvantaged	Residential houses, community services and facilities, local businesses, open space, greenspace and recreational facilities, PRoW, local footpaths and cycleways, public transport, bus stops	People on low incomes (living in deprived areas is a proxy measure for low income) and people without access to a car constitute a sensitive group as they are likely to walk further because they cannot afford public transport or to own a car, and their lack of transport options may limit life and work opportunities. Those on low incomes may be less able to adapt to changes in access, such as greater travel distance or alternative transport provision. People living in deprived areas tend to suffer the most from road traffic incidents (deaths and injuries), noise and air pollution, as they tend to be characterised by high traffic volume, as well as other environmental burdens such as industrial facilities. This group is generally more likely to already have reduced access to health and social care as well as reduced access to other services and amenities. This group may have increased stress levels due to the factors above. In addition, this group is more sensitive to food insecurity, which has an access dimension.	**Yes:** Springbank has the highest percentage of households deprived in three or more deprivation dimensions when compared to other wards, a proportion above the national averages. However, there are no identified health deprivation hotspots present in all wards, except for in Swindon Village. Population density and the percentage of overcrowded housing is highest in St Peters. St Peter's when compared to other wards and significantly higher than the national average. Additionally, the percentage of pensioners without household access to a car or van is the highest in St Peter's. St Peter's ward has a particularly low AHAH air quality score when compared to all other wards. The percentage of housing without central heating is higher than the national average in Severn Vale South and Swindon Village wards. Springbank ward exhibits higher than average dependency across a range of benefits, as well as higher than national average statistics for youth unemployment. Dependency on benefits is also notable in St Peter's and Swindon Village wards.
Sensitive Group – People from black and minority ethnic backgrounds	Residents living in houses, operators and users of community land and facilities, users of open space, recreation, and leisure activities, WCH,	There is a general consensus that inequalities exist in the health and healthcare experiences of ethnic minority groups in England. Access to primary health services is generally equitable for ethnic minority groups, but this is less consistently so across other health services.	**Yes, very small percentage:** The population within the study area is predominantly of a White-British ethnicity. St Peter's is the most ethnically diverse ward with the highest proportion of ethnic minority groups when compared to other wards in the study area, though lower than the national average.

Group	Relevant receptor / medium	Explanation	Are these groups identified in the study area
	public transport users and vehicle travellers	While the incidence of cancer is highest in the white population, rates of infant mortality, cardiovascular disease (CVD) and diabetes are higher among black and south Asian groups. CVD and diabetes cause significant morbidity among these groups, much of which can be prevented by public health measures aimed at tackling risk factors such as obesity, poor diet, inadequate physical activity and smoking.	The box above concludes that that the population in St Peter's is of more of a material disadvantage when compared to all other wards in the study area.

Table 13-47 – Health receptor sensitivity to determinants of health

Receptor group	Sensitivity category	Reason for sensitivity
WIDER POPULATION AND SUB-POPULATIONS		
Wider population (Study area across seven wards – General)	Medium – rural context Low – urban context	Deprivation: Households deprived in one or more dimensions are similar to national averages and between wards, with higher levels of no household deprivation in Severn Vale North. Across all wards, Swindon Village is the only ward with a deprivation hotspot covering 25.4% of the population. Resource sharing: Between all wards there are c. seven primary schools and one secondary and sixth form school, All Saints Academy which also hosts the Polish Language School in Cheltenham. There are two known assisted living/care homes within the study area. There is a high concentration of health, leisure, and community assets within Springbank, compared to other wards, and within Cheltenham town centre. Existing inequalities: No notable data Outlook: No notable data Life stage/health statistics/daily activities: In terms of the proportion of the population over 65, St Peter's (12.2%) and Springbank (16.2%) stand out as substantially below the county (21.4%) and national (18.4%) averages, which contrasts with the other wards of the study area. The proportion of the population under the age of 16 is lower than the national average (18.6%) across all wards

Receptor group	Sensitivity category	Reason for sensitivity
		except for Springbank (20.8%). The proportion of people with no long term physical or mental health conditions across all wards is higher than the national average (75.9%) with the exception of Badgeworth (73.7%) and Springbank (75.7%). Capacity to adapt: The wider population is in relatively good health and has good access to an array of health, leisure, and community assets. There is a greater capacity to adapt within the more urban parts of the study area where accessibility to health infrastructure is greater in comparison to the more rural parts. This is reflected in the sensitivity categories.
Families with children and adolescents (pregnant and maternal women, babies, children, and adolescents)	High	Deprivation: No data available. It is noted that children, adolescents, and women on maternity leave are unlikely to be able to participate either at all, or fully within the labour market. This could contribute to deprivation either on a permanent or temporary basis. Resource sharing: Between all wards there are c. seven primary schools and one secondary and sixth form school, All Saints Academy. There is one known nursery, Giggles Nursery, and a Polish Language School within the study area. Existing inequalities: There is a higher proportion of children in relative low income families (18.3%) and absolute low income families (15.1%) in Springbank when compared to all other wards in the study area, although slightly lower proportions (by 0.3%) than national averages. Children emergency admissions to hospital are notably higher than the national average across all wards. Outlook: No notable data. Lifestage/health statistics/daily activities: There are households with children present within the study area. Between all wards in the study area, Springbank has the highest proportion of children aged between 0-15 years (20.8). Springbank also has the highest proportion of lone parent families (15.5%) when compared to all other wards and is the only ward with a higher proportion than the national average (11.1%). The General Fertility Rate (57.9) and Total Fertility Rate (1.66) in the Tewkesbury area is higher than that of the England average (53.6 and 1.59 respectively), indicating higher average rates of pregnancy. Capacity to adapt: Children and adolescents constitute a sensitive population group due partly to their need to be able to move around freely to and from school, open space, greenspace, and recreational activities, whilst they lack the experience and judgement displayed by adults when moving around in traffic and public spaces and when using public transport and related

Receptor group	Sensitivity category	Reason for sensitivity
		infrastructure. Hence, children and adolescents as pedestrians and cyclists are at elevated risk from danger distributed by motorised transport. Furthermore, children are more sensitive than adults to air pollution, noise, odour and other environmental factors and their bodies and minds are less able to deal with them. Particularly susceptible children are those from low-income and/or black and minority ethnic (BME) backgrounds and/or living in deprived areas.
People who are physically or mentally disadvantaged (elderly people, people with physical disabilities, people with other health problems or impairments)	High	Deprivation: No data available. It is noted that members of this sub-population are less likely to be able to participate either at all, or fully within the labour market. This could contribute to deprivation either on a permanent or temporary basis. Resource sharing: There are care facilities within the study area, including an assisted living residential home for those with disabilities; care home for those aged over 65; and a dementia-only care home. Greensteps National Star has a facility within the study area – this is an organisation that supports people with physical and learning disabilities and acquired brain injuries. Existing inequalities: There is a higher percentage of the population receiving Disability Allowance claimants in Badgeworth (2.4%) and Springbank (2.6%) than the national average and compared to other wards. Outlook: No notable data. Lifestage/health statistics/daily activities: The population within the study area is predominantly ageing, with an older population than the national average. Obesity is also a notable issue for the majority of the study area with most wards recording above national average statistics across age groups. Within the study area, Badgeworth and Severn Vale South wards have the highest proportion of people aged 65 years or above and the lowest proportions of children aged 0-15 years. Badgeworth also has the highest percentage of one person pensioner (aged 66 and over) households, above that of the national average. Badgeworth and Severn Vale South populations have higher percentages of back and severe back pain when compared to other wards in the study area. Badgeworth (17.5%) and Springbank (17.6%) wards have the highest percentage of disabled individuals whose day-to day activities are “limited a lot” and “limited a little”. Badgeworth also has

Receptor group	Sensitivity category	Reason for sensitivity
		the highest percentage of individuals who are not disabled but have a long term physical or mental health condition but day to day activities are not limited (8.8%) when compared to all wards. Local insights data indicates a sharp rise in the proportion of the population recording symptoms of anxiety and depression at the County level. Capacity to adapt: People who are mentally or physically disadvantaged constitute a sensitive population group. Many individuals within this group will experience mobility impairment and may rely on public transport and the support of carers or other individuals in accessing facilities, services, and open spaces. People with anxiety may experience greater challenges in adapting to new situations and new routines. All members of this sub-group may be particularly susceptible to disruptions to access and movement within the study area. People with pre-existing medical conditions, particularly respiratory or heart conditions and suppressed immune systems may be more susceptible than the wider population to changes in air quality and contamination risks.
People who are materially disadvantaged	High	Deprivation: Springbank has the highest percentage of households deprived in three or more deprivation dimensions when compared to other wards, however these proportions are not significantly higher and reflect national average proportions. There are no identified health deprivation hotspots present in all wards, except for in Swindon Village. Resource sharing: This group is generally more likely to already have reduced access to health and social care as well as reduced access to other services and amenities. This group is more sensitive to food insecurity, which has an access dimension. Existing inequalities: Springbank ward exhibits higher than average dependency across a range of monetary benefits, as well as higher than national average statistics for youth unemployment. Dependency on benefits is also notable in St Peter's and Swindon Village wards. Additionally, the percentage of pensioners without household access to a car or van is the highest in St Peter's. Outlook: No data available. Lifestage/health statistics/daily activities: Correlations are not direct within the data. Capacity to adapt: People on low incomes (living in deprived areas is a proxy measure for low income) and people without access to a car constitute a sensitive group as they are likely to walk further because they cannot afford public transport or to own a car, and their lack of transport options

Receptor group	Sensitivity category	Reason for sensitivity
		may limit life and work opportunities. Those on low incomes may be less able to adapt to changes in access, such as greater travel distance or alternative transport provision. People living in deprived areas tend to suffer the most from road traffic incidents (deaths and injuries), noise and air pollution, as they tend to be characterised by high traffic volume, as well as other environmental burdens such as industrial facilities. This group may have increased stress levels due to the factors above.
Study area residents: people from black and minority ethnic backgrounds	High	There is a very small percentage of ethnic minorities within the study area as the population are of a predominantly of White-British ethnicity. St Peter's is the most ethnically diverse ward with the highest proportion of ethnic minority groups (25.7%) when compared to other wards in the study area. Deprivation: No data available. Resource sharing: Notably, the All Saints Academy secondary school in Springbank hosts the Polish Language School in Cheltenham which offers Polish language lessons for primary school aged children on Saturdays. Existing inequalities: There is a general consensus that inequalities exist in the health and healthcare experiences of ethnic minority groups in England. Access to primary health services is generally equitable for ethnic minority groups, but this is less consistently so across other health services. Outlook: No data available Lifestage/health statistics/daily activities: No specific data available. While the incidence of cancer is highest in the white population, rates of infant mortality, cardiovascular disease (CVD) and diabetes are higher among black and south Asian groups. CVD and diabetes cause significant morbidity among these groups, much of which can be prevented by public health measures aimed at tackling risk factors such as obesity, poor diet, inadequate physical activity, and smoking. Capacity to adapt: Ethnic minority communities constitute a sensitive population group. Ethnic minority communities can face linguistic or cultural barriers which can limit their access to services and confidence to participate in social opportunities. In the UK, ethnic minorities also generally have a lower disability-free life expectancy at birth, higher unemployment, experience higher work stress and higher rates of poverty than white communities. This group has a lower capacity to adapt due to

Receptor group	Sensitivity category	Reason for sensitivity
		the potential cost of travel as a result of changes to access. Also, changes to access arrangements and routines may lower their confidence resulting in increased stress and social exclusion.
GEOGRAPHICAL SUB-POPULATIONS		
Residents of properties at north-west Cheltenham (South of the A4019/Princess Elizabeth Way roundabout – St Peters)	Medium	Deprivation: The proportion of households not deprived in any dimension is not significantly higher in St. Peter's when compared to other wards and reflect national average proportions. There are no deprivation health hotspots identified in St Peters. Resource sharing: Good accessibility to a range of assets within the urban envelope of Cheltenham, including a choice of healthcare, leisure and recreation opportunities. Existing inequalities: Life expectancy for men (77.6) is lower than the national average (79.5) whilst the life expectancy for females (83.7) is similar to the national average (83.2). The life expectancy for males and females in St Peters is lower than all other wards in the study area. Population density is significantly higher (50.3 persons per ha) than the national average (4.3 persons per ha) and when compared to other wards, in turn the percentage of overcrowded housing (13.2%) is highest in St Peter's when compared to other wards. Outlook: The consultation process has not highlighted specific concerns from large numbers of people resident in this location. Lifestage/health statistics/daily activities: The proportion of the population over the age of 65 (12.2%) is notably lower than all other wards in the study area and lower than the national average (18.4%). The proportion of the population under 16 years of age (16.4%) is lower than the national average (18.6%). There is relatively good health similar to national averages. The proportion of the population reporting that no long-term physical or mental health conditions (76.3%) is slightly higher than the national average (75.9%). Capacity to adapt: Population within St Peters is predominantly of working age, with relatively good health and lower quality standard of living. In terms of access to community and leisure facilities these people have a relatively good level of capacity to adapt with the majority of assets siting outside of the Scheme area.

Receptor group	Sensitivity category	Reason for sensitivity
Residents of properties at Uckington, Moat Lane and Cooks Lane	High	Deprivation: There are relatively low deprivation levels within Severn Vale South when compared to other wards, with 55.4% of households not deprived in any dimension which is higher than the national average (49.4%). Resource sharing: Few assets within the community – Uckington and Elmstone Hardwicke Village Hall provides a lettable space hosting events such as exercise and dance classes, Women Institute meetings, parish council meetings. For organised sporting activities some residents will be able to access the Cheltenham Civil Service Tennis and Football Clubs but for the majority it is likely that they will need to travel some distance beyond Uckington to access recreational facilities. Leisure facilities are located at Gallagher Retail Park and within Cheltenham town centre. Existing inequalities: The proportion of pensioner households with no access to a car or van (5.3%) is significantly lower than the national average (40.8%) and lower than all other wards in the study area. The proportion the population claiming pension credit claimants is also lower than all other wards. Outlook: Uckington residents have been actively engaged with the Scheme through consultation activities. It is also noted that a high proportion of comments provided on proposed development at the North West Cheltenham Development Area (Elms Park – 16/02000/OUT) have been made by residents of the community of Uckington – they are generally opposed to the proposals. There is considered to be a level of community anxiety relating to the changes that development may bring. Lifestage/health statistics/daily activities: These properties lie within the ward Seven Vale South. Severn Vale South has the highest proportion of the population aged over 65 years (25.5%) and the lowest proportion of under 16s (12.9%) when compared to all other wards and national averages. It is anticipated residents are fairly affluent and have relatively good health, despite the largely older population. Capacity to adapt: The A4019 is likely to be a key transport corridor for accessing and participating in a number of daily activities for this community, so it will be relatively difficult for community members to seek to avoid the Scheme during the construction phase.
Residents of properties adjacent to the B4634 (includes Hayden).	Medium	Deprivation: There are relatively low deprivation levels within Severn Vale South when compared to other wards, with 55.4% of households not deprived in any dimension which is higher than the national average (49.4%).

Receptor group	Sensitivity category	Reason for sensitivity
		Resource sharing: This is a linear community with no single focus for community assets – it is possible that residents may use facilities to the west at Staverton and other rural villages, but it is expected that Cheltenham to the east will be a destination for key healthcare, recreational and leisure needs. Existing inequalities: The proportion of pensioner households with no access to a car or van (5.3%) is significantly lower than the national average (40.8%) and lower than all other wards in the study area. The proportion the population claiming pension credit claimants is also lower than all other wards. Outlook: Residents who are likely to be directly affected by the Scheme have been actively involved in consultation activities. Lifestage/health statistics/daily activities: Severn Vale South has the highest proportion of the population aged over 65 years (25.5%) and the lowest proportion of under 16s (12.9%) when compared to all other wards and national averages. It is anticipated residents are fairly affluent and have relatively good health, despite the largely older population. Capacity to adapt: The B4634 and A4019 junction is likely to be a strategic transport corridor for accessing and participating in a number of daily activities for this community. However, there will be opportunities for residents to take alternative routes into Cheltenham; and routes to key assets and facilities are unlikely to be directly affected by the Scheme.
Residents of properties at Homecroft Drive and Appleyard Close (north).	High	Deprivation: There are relatively low deprivation levels within Severn Vale South when compared to other wards, with 55.4% of households not deprived in any dimension which is higher than the national average (49.4%). Resource sharing: Residents may use the Civil Service Sports and health and community facilities located in Springbank. Residents may also use the Elmstone and Uckington Village Hall, in Uckington and may participate in organised sport at the Civil Service Tennis and Football Clubs. Residents are also likely to access community, recreational and health services in Springbank, south of these properties and in Cheltenham town centre. Existing inequalities: The proportion of pensioner households with no access to a car or van (5.3%) is significantly lower than the national average (40.8%) and lower than all other wards in the study

Receptor group	Sensitivity category	Reason for sensitivity
		area. The proportion the population claiming pension credit claimants is also lower than all other wards. Outlook: Consultation responses from residents in this location have expressed a need for improved control and safety of access from their properties to the A4019 corridor. Life stage/health statistics/daily activities: Severn Vale South has the highest proportion of the population aged over 65 years (25.5%) and the lowest proportion of under 16s (12.9%) when compared to all other wards and national averages. It is anticipated residents are fairly affluent and have relatively good health, despite the largely older population. Capacity to adapt: The A4019 is likely to be a key transport corridor for accessing and participating in a number of daily activities for Homecroft Drive residents and Appleyard Close.
Residents of properties at Withybridge Gardens and Stanboro Lane (including Sheldon Cottages) and Withybridge Lane. (around the M5 Junction 10)	High	Deprivation: Residents sit between wards Severn Vale North and Severn Vale South. These wards have the low levels of deprivation when compared to other wards in the study area. Resource sharing: Residents are likely to participate in activities at Elmstone and Uckington Village Hall and may participate in organised sport at the Civil Service Tennis and Football Clubs. Residents are also likely to access community, recreational and health services in Cheltenham to the east of these properties. Existing inequalities: This is a relatively more affluent area. Outlook: Awareness of the potential for their homes to be compulsorily purchased and subsequently demolished – direct consultation in relation to the Scheme and many residents have engaged agents to support negotiations – this will be associated with anxiety and stress for residents and wider community members. Lifestage/health statistics/daily activities: Residents are fairly affluent and have relatively good health, despite the largely older population. Capacity to adapt: These properties are directly adjacent to or/within the Order limits of the Scheme and therefore have a low capacity to adapt to the Scheme, particularly in relation to accessing facilities to undertake daily activities.

Receptor group	Sensitivity category	Reason for sensitivity
Residents of properties within Springbank	Medium	Deprivation: There are slightly higher levels of deprivation across deprivation dimensions in Springbank when compared to other wards, although similar to national averages. Resource sharing: There is good accessibility to a range of assets within the ward including George Reading Play Area, Pilgrove Way Playground, Hayden Road Allotments, All Saints Academy and Springbank Community Resource Centre (includes Cheltenham Pharmacy, Giggles Nursery, a dentist and doctors surgery). Existing inequalities: Life expectancy from birth for males (78.1) and females (80.6) is lower than national average life expectancies for males (79.5) and females (83.2). Life expectancy for females in Springbank is also lower than other wards within the study area. Outlook: The consultation process has not highlighted specific concerns from large numbers of people resident in this location. Lifestage/health statistics/daily activities: The area has a higher proportion of young families, due to the higher proportion of children aged 0-15 years old (20.8%) when compared to the national average (18.6%) and other wards within the study area. Poor lifestyle behaviours are present which above national average levels of binge drinking (24.0%) and smoking (37.8%). Self-reported census statistics state that 80.9% report very good or good health. Capacity to adapt: This ward has a high representation of dependents and good access to a variety of community and recreational facilities, without the need to travel through areas of construction works. This population may also be able to access community facilities within Cheltenham or Gloucester without entering the Order limits. However, some noise and traffic disruptions are anticipated for users of community and open spaces and residents. Overall, the population is considered to have a high capacity to adapt in relation to accessing community assets.
Residents of properties at Swindon Village.	Low	Deprivation: There is a health deprivation hotspot affecting 25.4% of the population of Swindon Village ward. The ward has the highest proportion of households without central heating (7.1%) when compared to all other wards within the study area.

Receptor group	Sensitivity category	Reason for sensitivity
		Resource sharing: There are few community assets within Swindon Village, notable assets include Swindon Village Community Hall, Allotments and Swindon Village Park. Leisure and health facilities are located at Gallagher Retail Park and within Cheltenham town centre. Existing inequalities: The average life expectancy for males (83.5) and females (84.0) in Swindon Village are higher than national average life expectancies. Outlook: The consultation process has not highlighted specific concerns from large numbers of people resident in this location. Lifestage/health statistics/daily activities: The proportion of the population that is aged over 65 (20.1%) is above the national average (18.4%). Self-reported census statistics on very good and good health are similar to national averages and those reporting no long term physical or mental health conditions (76.1%) is slightly above the national average (75.9%). Capacity to adapt: The health of residents is fairly good, with a proportionate level of dependents living in the area. Despite the higher level of deprivation within this ward when compared to others, residents can access a wide range of community facilities at Gallagher Retail Park and within Cheltenham town centre without passing through the Order limits.
Residents of the informal Traveller site adjacent to the M5.	High	Deprivation: Data not available. Resource sharing: This is an isolated community with no single focus for community facilities. Residents are likely to travel to the western outskirts of Cheltenham to access leisure, health, community, and educational facilities. Existing inequalities: Data not available. Outlook: Attempts have been made to consult with residents of this site in relation to the Scheme. To date, efforts continue but the residents have been unwilling to engage with Scheme representatives. Lifestage/health statistics/daily activities: Data not available. Capacity to adapt: The informal Traveller site sits adjacent to the M5, north of Junction 10. The community is isolated, utilise community facilities outside of the informal Traveller site and the site is only accessible via a road off the A4019, therefore it will be difficult for community members to avoid

Receptor group	Sensitivity category	Reason for sensitivity
		the Scheme during the construction phase when participating in daily activities. Traveller community groups have Protected Characteristics and therefore are considered to be a sensitive population group.
Users of the PRoW / WCH network within the Order limits and connecting parts of the study area.	High	Deprivation: Data not available. Resource sharing: Data not available. Existing inequalities: Data not available. Outlook: Data not available. Lifestage/health statistics/daily activities: Local walkers, cyclists and equestrians using the WCH networks are at an elevated risk from danger distributed by motorised transport. Capacity to adapt: The majority of PRoW/WCH assets within the study area are anticipated to be used recreationally. WCH routes which cross the Order limits will be severed for a duration of the construction period, users of these routes will have a low capacity to adapt. As routes are predominantly used recreationally users may be able to use other routes for recreational routes.
Construction workers working within Site Compounds and the Scheme Works Area.	Medium	Deprivation: Data not available. On the basis that this group comprises workers, all can be considered to be of working age and active in the labour market. Resource sharing: Data not available. It is typical for construction workers on large infrastructure projects to comprise a combination of locally based individuals as well as those that will elect to semi-second/relocate on a temporary basis. This latter proportion are unlikely (typically, but not exclusively) to engage with resources within the study area, having a strong focus on a physically demanding job role. Existing inequalities: Data not available. Outlook: Data not available. Lifestage/health statistics/daily activities: No data available, however, the nature of work requires workers to be physically fit. Key challenges to physical health, mental and social wellbeing of the

Receptor group	Sensitivity category	Reason for sensitivity
		construction workers arise from unhealthy lifestyle choices, and the pollution (air, ground contamination, noise) and hazards (risk of injury or death) associated with construction works. Capacity to adapt: This community group are likely to be unfamiliar with the local area and therefore will experience small to slight access and service implications. As workers will be involved in the construction of the Scheme, they will not be able to avoid the impacts and risks associated with construction works. Construction workers will have awareness of these impacts reducing the effect on quality of life.
COMMUNITY ASSETS		
Cheltenham West Fire Station	High	Deprivation: Data not available. Resource sharing: This is an emergency service which is likely to serve the rural communities north of the M5 Junction 10, east of the M5 motorway and areas west of Princess Elizabeth Way. Existing inequalities: Data not available. Outlook: The premises are directly affected by the Scheme and have been engaged in consultation and discussions as the proposals have been developed. Lifestage/health statistics/daily activities: Due to the nature of employment, employees are anticipated to be relatively fit and healthy, with few mobility issues. The age and lifestyle of residents who may need these services will vary. Capacity to adapt: This receptor is an emergency service and located adjacent to the A4019. The need for these services depends on the local community requiring their service and their location, therefore the services provided have a limited ability to adapt as those requiring their services are unknown. Movement through the study area will be restricted as result of the works on the A4019.

Receptor group	Sensitivity category	Reason for sensitivity
Users of Cheltenham Civil Service Tennis and Football Clubs.	High	Deprivation: This is a members club for people who have a connection to civil service employees. It can therefore be assumed that the members will be relatively less deprived on the basis that they have employment and some level of disposable income for membership. Resource sharing: All members will have access to the facilities at this asset which include tennis courts, football pitches, archery, club house and bar and conference rooms. Existing inequalities: Data not available for this member group. Outlook: The owner of the club has been actively engaged with consultation relating to the Scheme and expressed a willingness to engage with the Scheme designers to discuss how the facility will be affected by the proposals. This may also lead to a level of stress or anxiety about how the club and its members will adapt, particularly during construction. Lifestage/health statistics/daily activities: Data not available for this member group. Capacity to adapt: The A4019 is a key transport corridor for accessing and participating in activities at this receptor. It will be difficult for members to avoid the Scheme during the construction phase. However, members may have disposable income to attend other member leisure spaces.
EMPLOYMENT AND TRAINING ASSETS		
Greensteps National Star – employees and students	High	Deprivation: Data not available. Resource sharing: All students of National Star Collage will have access to Greensteps enterprise centre. The main campus is located in Ullenwood, Cheltenham. Activities for students at this receptor include upcycling furniture, making homemade cards and gifts, and gardening projects. The centre also hosts annual student recruitment days. Existing inequalities: Data not available. Outlook: Data not available. Lifestyle/health statistics/ daily activities: No specific data available. National Star Collage is a specialist further education collage which offers residential and day courses for around 200 students

Receptor group	Sensitivity category	Reason for sensitivity
		with disabilities and acquired brain injuries aged between 16 – 25 years old between campuses at Ullenwood, Hereford and Wales. Capacity to adapt: People who are mentally or physically disadvantaged constitute a sensitive population group who experience mobility impairments and may rely on public transport and the support of carers or other individuals in accessing facilities, services and open spaces (see sub population group – 'people who are physically or mentally disadvantaged' within this Table for further details). There are no alternative facilities that offer equivalent activities within the local community and the A4019 is a key transport corridor to access the centre.
Employees at Gallagher Retail Park and Kingsditch Trading Estate.	Medium	Deprivation: Data not available – employment indicates that these employees are relatively less deprived. Resource sharing: Data not available. Existing inequalities: Data not available. Outlook: The consultation process has not highlighted specific concerns. Lifestage/health statistics/daily activities: Data not available. Capacity to adapt: The A4019 is a key transport corridor for accessing the Gallagher Retail Park and Kingsditch Trading Estate. There are alternative access points to Kingsditch Trading Estate and Gallagher Retail Park via Kingsditch Lane and Manor Road; however, this location will be subject to impacts from the Scheme for a prolonged period during construction and employees may experience challenges adapting to daily impacts on their working schedule.
Employers and employees to businesses adjacent to the A4019 (including The Gloucester Old Spot public house, Stanboro Fish Farm, Cooks Lane businesses).	High	Deprivation: Data not available – employment indicates that these employees are relatively less deprived. Resource sharing: Not applicable. Existing inequalities: Data not available.

Receptor group	Sensitivity category	Reason for sensitivity
		Outlook: There may be some level of stress/anxiety for these businesses as they are independently owned and predominantly rely on employees and customers/clients to access the business premises using the A4019. Lifestage/health statistics/daily activities: Data not available. Capacity to adapt: These independent businesses have a very low capacity to adapt as they are reliant on the A4019 as a key transport corridor for business activities and custom.

13.12.105. This section provides an overview of the characteristics of the human health study area baseline. It is organised by the determinant of health topics introduced earlier, within Table 13-8. It is provided to further contextualise the narrative provided later within the assessment tables.

Access to community, recreational and educational facilities

13.12.106. The majority of community facilities within the study area are located within the areas of townscape character along the western edges of Cheltenham. The more rural parts of the study area host fewer community facilities, mirroring the relatively lower density of the population who reside there. Notable destinations include the Uckington and Elmstone Hardwicke Village Hall and the Cheltenham Civil Service Tennis and Football Clubs, together with the intermittent network of PRoW that pass through the study area.

13.12.107. Congestion and queuing are key prevailing conditions for vehicle travellers using the M5 close to Junction 10. This includes regular queuing along the A4019, within and extending beyond the Order limits. There are several residential, business and community facilities within the study area that have direct access onto the A4019. The unpredictable and often congested characteristics of traffic flow along the A4019 have been noted through consultation as a source of stress for residents, particularly when there is a desire to make journeys that require the A4019 to be crossed (i.e. turning right from properties to the south and turning left from properties to the north).

13.12.108. The baseline conditions are characterised by 'rat-running' through residential areas to gain access to the M5 at Junction 11 as an alternative to Junction 10; and also to avoid arterial routes to improve journey times between key destinations such as central Cheltenham and the motorway network. This sort of driver behaviour is typically linked to driver stress, especially during peak times. It also has the effect of introducing higher traffic levels along routes that are not designed for high vehicle throughput (e.g. residential areas often lined with parked cars), which can introduce safety concerns, particularly for pedestrians and other WCHs.

13.12.109. It is considered unlikely that residents of the larger settlements such as Cheltenham will travel through the Order limits in large numbers in order to access the community facilities within the study area; however, people commuting into Cheltenham from the north and west are expected to pass through the Order limits. An exception may be the All Saints Academy, which hosts Cheltenham Town FC on a regular basis several times weekly, as well as the daily term time movements of its academic community; and holiday movements for school club members.

13.12.110. There are regular bus services that provide public transport access between Cheltenham, Northway, and Mitton. These services pass through the Order limits and they may serve to reduce some reliance on the use of private vehicles to access community, recreational and educational facilities.

13.12.111. Residents within isolated locations experience greater severance from the bus network than those within areas of dense townscape, this mirrors the density of these settlements and there is a proportionate level of accessibility based on the density of the townscape.

Access to green space and open space

13.12.112. There is very little public green space in the study area, with much of the agricultural land being privately owned. However, the various PRoW within the study area provide WCH access to green space assets outside of the study area.

13.12.113. The majority of the study area lies within Green Belt land.

13.12.114. Green and open space in the form of riverside areas at the River Chelt can be accessed from within the study area via a network of PRoW linking Cheltenham and the more rural locations to the west of the study area. The network of PRoW also provides access to green space outside of the study area, including the River Swilgate, Springfields Park and Coombe Hill canal.

13.12.115. There are two playgrounds within the study area – George Reading and Pilgrove Way playgrounds – both of which are publicly accessible. These are within the residential area that surrounds Blaisdon Way commercial premises and are expected to principally serve local residents.

13.12.116. The Hayden Road Allotments are accessed from Hayden Road (B4634), just to the south of the Order limits. It is operated by Cheltenham Borough Council and hosts 177 plots – the facility is noted on the CBC website as a large site with a strong sense of community and lots of family use.

Access to healthcare facilities

13.12.117. Residents of rural isolated settlements within the study area experience severance from key healthcare facilities located outside the study area, with the majority of GPs and dentist surgeries located within Cheltenham. Accessing these services for residents of the study area is likely to require travel along the A4019 (within the Order limits), with suitable public transport provision available during weekday and Saturday daytimes, but less frequent access options for out of hours or emergency travel.

13.12.118. Residents at the eastern end of the study area, within west Cheltenham, experience relatively greater accessibility to healthcare facilities than those residing elsewhere in the study area, due to their relative proximity to these facilities and public transport connections.

Characteristics of the transport network

13.12.119. There is an extensive range of footpaths that provide pedestrian access from within and beyond the study area, allowing pedestrian access between the rural settlements. It is considered that these will primarily be used recreationally, although there would be some level of use for commuting, particularly where the PRoW provide access to Cheltenham.

13.12.120. There is much less bridleway provision in the study area, which restricts the extent to which cyclists and horse riders can travel around the study area.

13.12.121. The study area includes the A4019, which provides a key route for vehicular traffic into Cheltenham from the west. The M5 also crosses through the study area. The B4634 provides vehicular access from Bamfurlong to Cheltenham, allowing for local traffic to access Cheltenham whilst avoiding M5 Junction 10.

13.12.122. There is public transport provision within the study area, providing access from Cheltenham to Tewkesbury, Ashchurch and Northway.

13.12.123. There are no rail services within the study area. The closest railway station is at Cheltenham.

Air quality

13.12.124. The air quality study area includes the AQMA administered by CBC for exceedances of the national NO_2 annual mean AQS objective.

13.12.125. Further information on the baseline conditions can be found in Chapter 5 - Air Quality (application document TR010063/APP/6.3).

Noise environment and vibration

13.12.126. Road traffic noise from the strategic roads in the study area, such as the M5 and A4019, is the dominant source of ambient noise in the study area.

13.12.127. There are a number of NIAs near the Order limits. Close to the M5 there are two NIAs. There is also an NIA on the A4019, to the west of Junction 10, as well as five NIAs on the A4019 to the east of Junction 10.

13.12.128. Further information on the baseline conditions can be found in Chapter 6 - Noise and Vibration (application document TR010063/APP/6.4).

Soil and water pollution

13.12.129. There are two historic landfill sites located within the study area. These are:

- Approximately 140 m north of the Order limits adjacent to the M5 northbound carriageway (Colman's Farm landfill).
- Adjacent to the Order limits at the A4019, within Gallagher Retail Park.

13.12.130. There have been six recorded pollution incidents to controlled waters within the Scheme study area, the last of which occurred in 1999.

13.12.131. Further information on the baseline conditions can be found in Chapter 10 - Geology and Soils (application document TR010063/APP/6.8).

Landscape amenity

13.12.132. The Scheme is wholly located in the LCT 'Settled Unwooded Vale'. The key characteristics of this LCT include soft gently undulating to flat landscape, limited woodland cover with mature hedgerow trees and mixed arable and pastoral land use.

13.12.133. The Scheme lies wholly within the SV6B: Landscape Character Area (LCA) 'Vale of Gloucester'. However, the M5 forms a spine through the heart of the Vale and there are frequent filtered views towards the motorway from the surrounding Vale landscape and the noise generated by motorway traffic is readily audible.

13.12.134. Further information on the baseline conditions can be found in Chapter 9 - Landscape and Visual (application document TR010063/APP/6.7).

Safety information

13.12.135. Table 13-43 above shows the KSI data within the study area which gives an indication as to the annual road safety totals for casualties and collisions in the study area for three years. The figures are generally inconclusive but note an increase in fatalities and serious injuries in Severn Vale South between 2019/20 – 2021/22, whilst Springbank Ward had slightly more favourable statistics when compared to the other wards. Collision data obtained for the period of 1st January 2016 to 31st December 2020 from GCC for the Scheme identifies that there have been 15 recorded collisions along the A4019. A high percentage of these collisions have been KSI collisions and have involved pedestrians and cyclists along the A4019; and three quarters of these collisions (3 of 4) at the A4019/B4634 junction involved drivers disobeying Automated Traffic Signals (ATS). Also, there have been five recorded collisions on the B4634, four of which were between Withybridge Lane and Blaisdon Way.

13.13. Outcomes assessment – Human Health

13.13.1. Impacts on Human Health receptors assessed as likely to result from the Scheme are set out below.

13.13.2. The Human Health sub-categories have been considered cumulatively within the identified communities, taking into account that each identified community may experience a number of health effects simultaneously. The sub-categories considered are listed below:

- Access to community (incorporating healthcare), recreational and educational facilities (including vocational training opportunities), including the location and type of facilities and severance/separation of communities from such facilities. Social cohesion is an element of this, including changes in the distribution and amount of housing.
- Access to green space and open space including the location and type of facilities and severance/separation of communities from such facilities.
- the spatial characteristics of the transport network across all modes and usage in the study area.
- air quality, including consideration of AQMAs and ambient air quality.

- noise environment and vibration, including areas recognised as being sensitive to noise.
- soil and water pollution, considering sources and pathways of potential pollution.
- landscape amenity.
- safety information, including risk of injuries and death, particularly associated with the road network.

13.13.3. Human Health effects are assessed during construction and then once the Scheme is established in operation.

13.13.4. In addition to the Scheme design and embedded mitigation (presented in Chapter 2 – The Scheme (Application document TR010063/APP/6.2)), the construction assessment takes account of impacts due to the movement of the construction workforce. This is informed by the findings of technical assessments of noise and air quality scenarios prepared using assumptions that have been made regarding the impacts of transport movements by the construction workforce. Details from these assessments are presented in Chapters 5 and 6 (Air Quality and Noise and Vibration respectively (~~a~~Application documents TR010063/APP/6.5 and TR010063/APP/6.6)). These assumptions are also presented in Chapter 2 – The Scheme (Application document TR010063/APP/6.2). The approach adopted is that controls on construction traffic movements will be defined and implemented through relevant Environmental Management Plans (EMPs), which are set out in the REAC (Application document TR0100063/ APP/7.4) at item G4. The Principal Contractor would have overarching responsibility for ensuring compliance with these controls[57].

13.13.5. The operational assessment takes account of people starting to normalise to the changes arising from implementation of the Scheme (as presented in Chapter 2 – The Scheme (Application document TR010063/ APP/6.2); and residential and employment development that the infrastructure to be delivered by the Scheme is intended to catalyse is assumed to have begun to be realised. This allows for the assessment to include any potential changes in the population's perceptions of the environment over time, as well as any landscape mitigation planting being semi-mature after 15 years.

13.13.6. This also takes into account the notion that after year 15 of operation, population and health effects associated with routine maintenance operations are unlikely to be significant.

[57] These trip volumes presented in these controls are derived from technical assessment of available headroom within the existing transport network, with a limit being set above which significant adverse noise effects or breaches of relevant air quality standards is considered likely. This is set out in Chapter 5 (Air Quality) and Chapter 6 (Noise and Vibration) of the ES (application documents TR010063/APP/6.3 and TR010063/ APP/6.4, respectively) and has been informed by modelling of traffic scenarios that look at existing traffic movements and future year scenarios, as well as including periods when the M5 slip roads will be closed.

Wider Population and Sub Populations

Table 13-48 – Health outcomes of construction activities on the wider population and sub populations

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
Wider Population: **Rural context** **Urban context**	**Air quality:** increase in traffic derived pollutants from queuing vehicles within areas under traffic management and alongside routes used as alternatives for those seeking to avoid managed areas (ARN is a proxy). Introduction of construction work areas in rural locations and formation of Link Road, both associated with construction traffic pollutants and dust generation. **Soil and water pollution:** increase in potential sources of pollution from construction traffic and within works areas. Pollutants may be mobilised by works with potential to contaminate groundwater. **Safety**: increased risk of conflict between different modes, particularly in areas	Medium (Rural context) Low (Urban context)	**Air quality:** increased risk to physical health, including respiratory and gastrointestinal problems and lower mental health outcomes. Persons with asthma and allergies may experience the greatest risk. Could affect members of the wider population, particularly those residing close to the ARN. Pollutant dispersion may be relatively less in the urban context than the rural. **Moderate magnitude** (low exposure, medium term duration, daily events, low changes in morbidity for wider population, large minority of population affected and gradual reversal as Scheme is implemented) **Soil and water pollution:** increased risk of encountering polluted soil or water through recreational activities; and in groundwater contamination. **Minor magnitude** (very low exposure, short term duration, occasional/unlikely events within strong control measures, small proportion of population would be affected by an event and rapid reversal anticipated) **Safety**: increased risk of injury for the wider population passing through areas under traffic management by a range of modes, and close to work sites. An individual's risk of injury may be influenced by many social,	**Rural context:** Air quality: Moderate adverse (significant) Soil and water pollution: Slight adverse (not significant) Safety: Slight adverse (not significant) Access: Moderate adverse (significant) Demolition: Large adverse (significant) Vocational opportunities: Slight beneficial (not significant) Noise: Moderate adverse (significant)	Air quality: Negative Soil and water pollution: Negative Safety: Negative Access: Negative Demolition: Negative Vocational opportunities: Positive Noise: Negative Separation from open space and recreational routes: Negative

	under traffic management and within and at approaches to works areas/haul routes. Unfamiliar layouts and temporary surfacing within traffic managed areas may increase the risk of injury through vehicle collisions, slips and trips. Impacts on water flow paths, which have the potential to affect flooding and areas at risk from flooding. **Access**: interrupted and evolving access arrangements between different parts of the study area, which may reduce the prevalence of Active Travel modes during construction. Disruption to configuration and level of public transport service may constrain the ability to readily access facilities and services supporting human health. **Demolition**: planned demolition of over 30 residential properties and a smaller number of commercial premises. This will have direct mental health impacts on affected residents and can also		personal, economic and environmental factors. Construction works will alter the landform, changing the water flow paths and the risks of flooding throughout the study area. **Minor magnitude** (medium scale, medium term duration for controls, controls should limit to occasional events/design solution to the management of flood risks, minor changes in morbidity and quality of life affecting a small minority of population, rapid reversal expected in response to any issue) **Access:** temporary disruptions to WCH routes and public transport services throughout the construction phase may contribute to a reduction in Active Travel to the detriment of physical health. Reductions in public transport accessibility or appeal may also constrain the ability of individuals to access services and facilities that support physical and mental health. **Moderate magnitude** (medium scale, medium term duration, affecting regular trips, moderate to major changes in quality of life, large minority of study area population affected, gradual reversal) **Demolition:** housing provides comfort, shelter, safety, and warmth as the main setting for health throughout people's lives. The prospect of forced relocation will have negative effects on mental health for the affected residents, as well as some members of the wider communities that will lose neighbours. **Major magnitude** (high scale, permanent, severity linked to changes in mental health, affected rural communities	Separation from open space and recreational routes: Slight adverse (not significant) Landscape amenity: Moderate adverse (significant)	Landscape amenity: Negative
				Urban context: Air quality: Slight adverse (not significant) Soil and water pollution: slight adverse (not significant) Safety: Slight adverse (not significant) Access: Slight adverse (not significant) Demolition: Moderate adverse (significant) Vocational opportunities: Slight	Air quality: Negative Soil and water pollution: Negative Safety: Negative Access: Negative Demolition: Negative Vocational opportunities: Positive Noise: Negative Separation from open space and recreational

	contribute to community anxiety relating to changing characteristics of settlements. **Vocational opportunities**: construction activities will generate employment opportunities that will be accessible to suitably qualified members of the wider population and offer the potential for vocational training and gaining transferable skills. **Noise**: introduction of additional sources of noise associated with construction vehicles, construction plant, machinery, and construction processes, which will include building demolition. Changes in the noise climate within the study area (the ARN is a proxy), including due to construction worker traffic. **Separation from open space and recreational routes:** construction works will introduce temporary diversions to WCH providing recreational access through the study area and reduce the		will experience substantial loss/change as a percentage of total population) **Vocational opportunities:** increased and varied opportunities for suitably qualified people within the wider population to gain vocational training through construction work job roles. Potential to also gain transferable skills for longer term benefit. **Minor magnitude (beneficial)** (small scale relative to the population, moderate change in quality of life for a small minority of the population) **Noise:** increased risk to physical health, social and mental well-being. Depending on individual susceptibility, members of the wider population could experience hearing sensitivity, sleep disturbance, cardiovascular and physiological effects, mental health, and behavioural effects including reduction in concentration and productivity. The effects are most likely to be associated with construction activities but could be associated with changes in traffic flows across the ARN. **Moderate magnitude** (low exposure, medium term duration, daily events, low changes in morbidity for wider population, large minority of population affected and gradual reversal as Scheme is implemented) **Separation from open space and recreational routes:** temporary disruptions to WCH routes and the progressive change to the location and reduced availability of open space in the study area, particularly close to to M5 Junction 10 and the Link	beneficial (not significant) Noise: Slight adverse (not significant) Separation from open space and recreational routes: Slight adverse (not significant) Landscape amenity: Moderate adverse (significant)	routes: Negative Landscape amenity: Negative

	access to rural parts of the study area where work sites and the Link Road will be sited. **Landscape amenity:** the construction activities will substantially alter the landscape amenity, associated with vegetation clearance, building demolition, visible work sites, traffic management (cones, signs, and lighting), construction vehicles and earthworks and road forming activities across the wider landscape.		Road. **Minor magnitude** (medium scale, medium term duration, affecting regular trips for a small minority of the population, moderate changes in quality of life, gradual reversal) **Landscape amenity:** transition of the landscape to accommodate a large scale construction site that will be visible from many parts of the study area, particularly in the early stages of vegetation clearance and site set up. This will reduce the landscape amenity due to visual intrusion and changes to the noise and lighting climate; and engender a more urban character. **Major magnitude** (medium to high exposure, medium to long term duration, continuous frequency, moderate to major changes in quality of life and mental health (for some of the population), majority of study area population affected, permanent changes).		
	Summary of effects assessment	The Scheme design and embedded mitigation include a combination of approaches that will avoid and/or seek to control many of the factors that contribute to changes in determinants of health. Of particular relevance are the controls on sources of pollution and the expectations of the appointment and activities of the PLO, both of which are set out within the EMP; coupled with the combined environmental design, which draws together landscape and noise attenuation (together with biodiversity and flood risk management). The combinations of receptor sensitivity and impact magnitude result in the following assessments of significance for the impacts of the Scheme plus embedded mitigation on determinants of health, noting some differences between the urban and rural context: **Slight beneficial and not significant**: Vocational training opportunities in the urban and rural context.			

		Slight adverse and not significant: Rural context – soil and water pollution risks; safety (including flood risk); separation and severance from open space and recreational routes. Urban context – air quality; soil and water pollution risks; safety (including flood risk); access; noise; separation and severance from open space and recreational routes. **Moderate adverse and significant:** Rural context – air quality; access; noise; landscape amenity. Urban context – demolition; landscape amenity. **Large adverse and significant:** Rural context – demolition.
		Embedded mitigation: Refer to G1, G2, G3, G4, G10, G11, AQ1, NV1, B6, B7, WE1, WE2, WE10, WE16-18, LV1, LV2, LV3, LV8, GS3, GS4, PHH1, PHH2, PHH3, PHH4, PHH5, PHH6, PHH9, PHH10, PHH11, PHH12, PHH13, PHH14, PHH15, PHH16, PHH18, C1, SD1, SD2, SD3, SD4, SD5, SD6 and SD7 in Table 13-56. **Essential mitigation:** Periodic review of the Scheme (at construction, opening year and post opening) against defined sustainability objectives (generated through collaborative workshop inputs during Scheme development) to ensure that intended sustainability benefits are appropriately reviewed, evidenced and recorded; and that continual improvement actions can be pursued through the establishment and implementation of a feedback loop. Weekly bulletins and feedback loop to respond to community concerns. Ensure that PLO communications include targeted information about how communities can move around to minimise disruption; and that there is an effective mechanism for PLO to generate change in the Scheme in response to feedback once construction is underway, through the Compensation Event procedure (refer to mitigation ref. PHH4, PHH9 and PHH13).

		PLO to prioritise direct liaison with residents anticipated to experience direct impacts on access during the construction phase, to ensure that suitable access and egress to their property is available at all times during the construction phase (refer to mitigation ref. PHH11). Minimising vegetation loss. Approach includes for detailed design process to seek to further reduce habitat loss and vegetation loss (refer to mitigation ref. B6 and LV2). Noise barrier design: to be developed in consultation with LPA and directly affected receptors to ensure that the final design provides visual amenity and/or biodiversity values as well as noise abatement (refer to mitigation ref. LV6). Controlling light pollution. Nuisance and disturbed sleep/night-time working: avoidance of work during hours of darkness, use of directional lighting and minimum operational levels for safety and security, landscaping design as per the environmental masterplan and sensitive design of noise barriers in consultation with the community (refer to mitigation ref: PHH7 and LV6). Targeted engagement to secure continuity of access: directly affected residential receptors and businesses to be engaged by PLO to ensure specific access needs are understood and met throughout construction (refer to mitigation ref. PHH11 and PHH12). Targeted engagement with local residents along A4019 to influence construction sequencing and any additional mitigation measures (for landscape amenity, noise and air quality as well as access), which may evolve once the Scheme is under construction (refer to mitigation ref. PHH16)	
	Outcome and residual effects assessment (effect + essential mitigation)	The overall health outcomes for the wider population are negative. The exception is for vocational training, where a positive outcome is predicted. **Rural context:** Air quality: The essential mitigation includes feedback loops to instigate change in the Scheme related both to the periodic sustainability review and the work of the PLO in understanding and responding to issues as they emerge. This has the potential to address issues that may relate to air quality and human health; however, on the basis that these are currently undefined, a precautionary approach to assessment means that the residual assessment remains **moderate adverse, which is significant.**	

		Soil and water pollution: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **slight adverse (not significant).** Safety: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **slight adverse (not significant).** Access: The essential mitigation includes feedback loops to instigate change in the Scheme related both to the periodic sustainability review and the work of the PLO in understanding and responding to issues as they emerge. In addition, there is a requirement for effective advance communication of changes to access arrangements, in consultation with affected receptors; supported by temporary signage strategies to all community facilities for all modes. Taken together, these essential mitigations are considered to reduce the magnitude of impact such that the residual effects assessment is **minor adverse, which is not significant.** Demolition: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **large adverse (significant)**. Directly affected property owners will be compensated through the CPO process. Vocational opportunities: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **slight beneficial (not significant).** Noise: The essential mitigation includes feedback loops to instigate change in the Scheme related both to the periodic sustainability review and the work of the PLO in understanding and responding to issues as they emerge. There is also a commitment to detailed design exploring changes to landscaping and barriers to achieve targeted noise abatement. This has the potential to address issues that may relate to noise and human health; however, on the basis that these are currently undefined, a precautionary approach to assessment means that the residual assessment remains **moderate adverse, which is significant.**	

		Separation from open space and recreational routes: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **slight adverse (not significant).** Landscape amenity: The essential mitigation includes feedback loops to instigate change in the Scheme related both to the periodic sustainability review and the work of the PLO in understanding and responding to issues as they emerge. There is also commitment that to exploring additional vegetation retention as part of the detailed design process and working directly with affected communities to refine proposals. This has the potential to address issues that may relate landscape amenity and human health; however, on the basis that these are currently undefined, a precautionary approach to assessment means that the residual assessment remains **moderate adverse, which is significant.** **Urban context:** Air quality: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **slight adverse (not significant).** Soil and water pollution: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **slight adverse (not significant).** Safety: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **slight adverse (not significant).** Access: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **slight adverse (not significant).** Demolition: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **moderate adverse (significant).** Directly affected property owners will be compensated through the CPO process.	

		Vocational opportunities: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **slight beneficial (not significant).** Noise: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **slight adverse (not significant).** Separation from open space and recreational routes: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **slight adverse (not significant).** Landscape amenity: The essential mitigation includes feedback loops to instigate change in the Scheme related both to the periodic sustainability review and the work of the PLO in understanding and responding to issues as they emerge. There is also commitment that to exploring additional vegetation retention as part of the detailed design process and working directly with affected communities to refine proposals. This has the potential to address issues that may relate landscape amenity and human health; however, on the basis that these are currently undefined, a precautionary approach to assessment means that the residual assessment remains **moderate adverse, which is significant.**	

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
Sub-Populations Families with children and adolescents (pregnant and maternal women, babies, children, and adolescents) People who are physically or mentally disadvantaged (elderly people, people with physical disabilities, people with other health problems or impairments)	**Air quality:** increase in traffic derived pollutants from queuing vehicles within areas under traffic management and alongside routes used as alternatives for those seeking to avoid managed areas (ARN is a proxy). Introduction of construction work areas in rural locations and formation of Link Road, both associated with construction traffic pollutants and dust generation. **Safety**: increased risk of conflict between different modes, particularly in areas under traffic management and within and at approaches to works areas/haul routes. Unfamiliar layouts and temporary surfacing within traffic managed areas may increase the risk of injury through vehicle collisions, slips and trips, particularly for this group where mobility is generally lower	High	**Air quality:** increased risk to physical health, including respiratory and gastrointestinal problems and lower mental health outcomes. Persons with asthma and allergies as well as individuals within this sub-population may experience the greatest risk. Could disproportionately affect those residing close to the ARN. Pollutant dispersion may be relatively less in the urban context than the rural. **Moderate magnitude** (low exposure, medium term duration, daily events, low changes in morbidity for wider population, large minority of population affected and gradual reversal as Scheme is implemented) **Safety**: increased risk of injury for members of this sub-population passing through areas under traffic management by a range of modes, and close to work sites. An individual's risk of injury may be influenced by many social, personal, economic, and environmental factors and this sub-population includes people who will have lower knowledge of road safety, as well as people with mobility limited by the use of pushchairs, maternity, disability or age. **Moderate magnitude** (medium scale, medium term duration for controls, daily movement through area, minor changes in morbidity and quality of life affecting a large	Air quality: Moderate adverse (significant) Safety: Moderate adverse (significant) Access: Moderate adverse (significant) Noise: Moderate adverse (significant) Separation from open space and recreational routes: Moderate adverse (significant) Landscape amenity: Large adverse (significant)	Air quality: Negative Safety: Negative Access: Negative Noise: Negative Separation from open space and recreational routes: Negative Landscape amenity: Negative

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
	and road safety awareness is lower. **Access**: interrupted and evolving access arrangements between different parts of the study area, which may reduce the prevalence of Active Travel modes during construction. Disruption to configuration and level of public transport service may constrain the ability to readily access facilities and services supporting human health. **Noise**: introduction of additional sources of noise associated with construction vehicles, construction plant, machinery, and construction processes, which will include building demolition. Changes in the noise climate within the study area (the ARN is a proxy) including due to construction worker traffic.		minority of population, gradual reversal as Scheme is implemented) **Access:** temporary disruptions to WCH routes and public transport services throughout the construction phase may contribute to a reduction in Active Travel to the detriment of physical health. Reductions in public transport accessibility or appeal may also constrain the ability of individuals to access services and facilities that support physical and mental health, which may disproportionately affect members of this sub-population. **Moderate magnitude** (medium scale, medium term duration, affecting regular trips, moderate to major changes in quality of life, large minority of study area population affected, gradual reversal) **Noise:** increased risk to physical health, social and mental well-being. Depending on individual susceptibility, members of this sub-population could experience disproportionate impacts due to greater daytime sleep requirements, juvenile development of hearing function or specific sensitivities due to disability. Effects could relate to hearing sensitivity, sleep disturbance, cardiovascular and physiological effects, mental health, and behavioural effects including reduction in concentration and productivity. The effects		

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
	Separation from open space and recreational routes: construction works will introduce temporary diversions to WCH providing recreational access through the study area and reduce the access to rural parts of the study area where work sites and the Link Road will be sited. **Landscape amenity:** the construction activities will substantially alter the landscape amenity, associated with vegetation clearance, building demolition, visible work sites, traffic management (cones, signs, and lighting), construction vehicles and earthworks and road forming activities across the wider landscape.		are most likely to be associated with construction activities but could be associated with changes in traffic flows across the ARN. **Moderate magnitude** (low exposure, medium term duration, daily events, low changes in morbidity for wider population, large minority of population affected and gradual reversal as Scheme is implemented) **Separation from open space and recreational routes:** temporary disruptions to WCH routes and the progressive change to the location and reduced availability of open space in the study area, particularly close to to M5 Junction 10 and the Link Road. At this life stage and/or with the specific characteristics, the sub-population is likely to have a greater dependence on the home environment and immediate environs and could be disproportionately affected by disruption to this. **Moderate magnitude** (medium scale, medium term duration, affecting regular trips for a large minority of the population, moderate to large changes in quality of life, gradual reversal) **Landscape amenity:** transition of the landscape to accommodate a large scale construction site that will be visible from many parts of the study area, particularly in the early stages of vegetation clearance and site set up. This will reduce the landscape		

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
			amenity due to visual intrusion and changes to the noise and lighting climate; and engender a more urban character. Members of the sub-population are likely to have a greater dependence on the home environment and immediate environs and could be disproportionately affected by disruption to this. Some members of the sub-populations may also have a considerably lower capacity to adapt to change, resulting in increased stress and anxiety. **Major magnitude** (medium to high exposure, medium to long term duration, continuous frequency, moderate to major changes in quality of life and mental health (for some of the population), majority of study area population affected, permanent changes).		
	Summary of effects assessment	The Scheme design and embedded mitigation include a combination of approaches that will avoid and/or seek to control many of the factors that contribute to changes in determinants of health. Of particular relevance are the controls on sources of pollution and the expectations of the appointment and activities of the PLO, both of which are set out within the EMP; coupled with the combined environmental design, which draws together landscape and noise attenuation (together with biodiversity and flood risk management). The combinations of receptor sensitivity and impact magnitude offer the choice between two categories of effects significance where a high sensitivity receptor experiences moderate impacts (as per DMRB LA104). In this instance, the lower band has been selected, reflecting the considerable scope of controls on relevant matters set out in the EMP. This results in the following assessments of significance for the impacts of the Scheme plus embedded mitigation on determinants of health: **Moderate adverse and significant:**			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		Air quality; safety; access; noise; separation from open space and recreational areas. **Large adverse and significant:** Landscape amenity.			
		Embedded mitigation: Refer to G1, G2, G3, G4, G10, G11, AQ1, NV1, B6, B7, WE1, WE2, WE10, WE16-18, LV1, LV2, LV3, LV8, GS3, GS4, PHH1, PHH2, PHH3, PHH4, PHH5, PHH6, PHH9, PHH10, PHH11, PHH12, PHH13, PHH15, PHH16, PHH18, SD1, SD2, SD3, SD4, SD5, SD6 and SD7 in Table 13-56. **Essential mitigation:** Periodic review of the Scheme (at construction, opening year and post opening) against defined sustainability objectives (generated through collaborative workshop inputs during Scheme development) to ensure that intended sustainability benefits are appropriately reviewed, evidenced, and recorded; and that continual improvement actions can be pursued through the establishment and implementation of a feedback loop. Weekly bulletins and feedback loop to respond to community concerns. Ensure that PLO communications include targeted information about how communities can move around to minimise disruption; and that there is an effective mechanism for PLO to generate change in the Scheme in response to feedback once construction is underway, through the Compensation Event procedure (refer to mitigation ref. PHH4, PHH9 and PHH13). PLO to prioritise direct liaison with residents anticipated to experience direct impacts on access during the construction phase, to ensure that suitable access and egress to their property is available at all times during the construction phase (refer to mitigation ref. PHH11). Minimising vegetation loss. Approach includes for detailed design process to seek to further reduce habitat loss and vegetation loss (refer to mitigation ref. B6 and LV2).		

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		Noise barrier design: to be developed in consultation with LPA and directly affected receptors to ensure that the final design provides visual amenity and/or biodiversity values as well as noise abatement (refer to mitigation ref. LV6). Controlling light pollution. Nuisance and disturbed sleep/night-time working: avoidance of work during hours of darkness, use of directional lighting and minimum operational levels for safety and security, landscaping design as per the environmental masterplan and sensitive design of noise barriers in consultation with the community (refer to mitigation ref: PHH7 and LV6). Targeted engagement to secure continuity of access: directly affected residential receptors and businesses to be engaged by PLO to ensure specific access needs are understood and met throughout construction (refer to mitigation ref. PHH11 and PHH12). Contractor required to provide sufficient space (pavement width for example) to allow pedestrians, including wheelchair and pushchair users; and cyclists to travel safely through areas under traffic management (refer to mitigation ref. PHH18). Targeted engagement with local residents along A4019 to influence construction sequencing and any additional mitigation measures (for landscape amenity, noise and air quality as well as access), which may evolve once the Scheme is under construction (refer to mitigation ref. PHH16)		
	Outcome and residual effects assessment (effect + essential mitigation)	The overall health outcomes for the sub-population are negative. Air quality: the essential mitigation includes feedback loops to instigate change in the Scheme related both to the periodic sustainability review and the work of the PLO in understanding and responding to issues as they emerge. This has the potential to address issues that may relate to air quality and human health; however, on the basis that these are currently undefined, a precautionary approach to assessment means that the residual assessment remains **moderate adverse, which is significant.** Safety: the essential mitigation includes feedback loops to instigate change in the Scheme related both to the periodic sustainability review and the work of the PLO in understanding and responding to issues as they emerge. In addition, there is a requirement for the contractor to accommodate people with additional mobility needs within the traffic management proposals in the interests of safety. Taking these			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		essential mitigation measures into account, the residual effects assessment reduces the magnitude of the impact, but the resultant effect remains **moderate adverse, which is significant.** Access: the essential mitigation includes feedback loops to instigate change in the Scheme related both to the periodic sustainability review and the work of the PLO in understanding and responding to issues as they emerge. In addition, there is a requirement for effective advance communication of changes to access arrangements, in consultation with affected receptors; supported by temporary signage strategies to all community facilities for all modes. Taken together, these essential mitigations are considered to reduce the magnitude of impact, but the resultant effect remains **moderate adverse, which is significant.** Noise: the essential mitigation includes feedback loops to instigate change in the Scheme related both to the periodic sustainability review and the work of the PLO in understanding and responding to issues as they emerge. There is also a commitment to detailed design exploring changes to landscaping and barriers to achieve targeted noise abatement. This has the potential to address issues that may relate to noise and human health; however, on the basis that these are currently undefined, a precautionary approach to assessment means that the residual assessment remains **moderate adverse, which is significant.** Separation from open space and recreational routes: the essential mitigation includes feedback loops to instigate change in the Scheme related both to the periodic sustainability review and the work of the PLO in understanding and responding to issues as they emerge. In addition, there is a requirement for effective advance communication of changes to access arrangements, in consultation with affected receptors; supported by temporary signage strategies to all community facilities for all modes. Taken together, these essential mitigations are considered to reduce the magnitude of impact, but the resultant effect remains **moderate adverse, which is significant.**		

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		Landscape amenity: the essential mitigation includes feedback loops to instigate change in the Scheme related both to the periodic sustainability review and the work of the PLO in understanding and responding to issues as they emerge. There is also commitment that to exploring additional vegetation retention as part of the detailed design process and working directly with affected communities to refine proposals. This has the potential to address issues that may relate landscape amenity and human health; however, on the basis that these are currently undefined, a precautionary approach to assessment means that the residual assessment remains **large adverse, which is significant.**			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
Sub-Populations People who are materially disadvantaged People from black and minority ethnic groups	**Air quality:** As per for the wider population **Safety**: increased risk of conflict between different modes, particularly in areas under traffic management and within and at approaches to works areas/haul routes. Unfamiliar layouts and temporary surfacing within traffic managed areas may increase the risk of injury through vehicle collisions, slips and trips. There is also the potential for miscommunication where English is not a primary language or literacy is not good. **Access**: interrupted and evolving access arrangements between different parts of the study area, which may reduce the prevalence of Active Travel modes during construction. Disruption to configuration and level of public transport service may constrain the ability to	High	**Air quality:** See wider population assessment **Safety**: increased risk of injury for members of this sub-population passing through areas under traffic management by a range of modes, and close to work sites. An individual's risk of injury may be influenced by many social, personal, economic, and environmental factors and this sub-population includes people who may have a greater predisposition to seek to enter worksites. **Moderate magnitude** (medium scale, medium term duration for controls, daily movement through area, minor changes in morbidity and quality of life affecting a large minority of population, gradual reversal as Scheme is implemented) **Access:** temporary disruptions to WCH routes and public transport services throughout the construction phase may contribute to a reduction in Active Travel to the detriment of physical health. Reductions in public transport accessibility or appeal may also constrain the ability of individuals to access services and facilities that support physical and mental health, which may disproportionately affect members of this sub-population. **Moderate magnitude** (medium scale, medium term duration, affecting regular trips, moderate to major changes in quality of life, large minority of	Safety: Moderate adverse (significant) Access: Moderate adverse (significant) Vocational opportunities: moderate beneficial (significant)	Safety: Negative Access: Negative Vocational opportunities: positive

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
	readily access facilities and services supporting human health. **Vocational opportunities**: construction activities will generate employment opportunities that will be accessible to suitably qualified members of the wider population and offer the potential for vocational training and gaining transferable skills. **Noise:** as per for the wider population. **Separation from open space and recreational routes:** as per for the wider population.		study area population affected, gradual reversal) **Vocational opportunities:** increased and varied opportunities for suitably qualified people within the wider population to gain vocational training through construction work job roles. Potential to also gain transferable skills for longer term benefit. **Minor magnitude (beneficial)** (small scale relative to the population, moderate change in quality of life for a small minority of the population) **Noise:** as per for the wider population. **Separation from open space and recreational routes:** as per for the wider population		
	Summary of effects assessment	The Scheme design and embedded mitigation include a combination of approaches that will avoid and/or seek to control many of the factors that contribute to changes in determinants of health. Of particular relevance are the controls on movement during construction and the expectations of the appointment and activities of the PLO, both of which are set out within the EMP. The vocational opportunities presented by the project have been assessed as a minor magnitude of impact. When combined with high sensitivity, DMRB LA104 allows for the selection of slight or moderate beneficial effects. In this instance, moderate beneficial effects have been concluded,				

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		reflecting that a substantial proportion of the construction roles are likely to be suitable for entry level or lower level qualifications, which will increase their appeal and suitability for these sub-populations. The combinations of receptor sensitivity and impact magnitude offer the choice between two categories of effects significance for the adverse effects (as per DMRB LA104). In this instance, the lower band has been selected, reflecting the considerable scope of controls on relevant matters set out in the EMP. This results in the following assessments of significance for the impacts of the Scheme plus embedded mitigation on determinants of health: **Moderate adverse and significant:** Safety; access. **Moderate beneficial and significant:** Vocational opportunities.		
		Embedded mitigation: Refer to G1, G2, G3, G4, G10, G11, PHH1, PHH2, PHH3, PHH4, PHH5, PHH9, PHH11, PHH12, PHH13, PHH14, PHH15, PHH18, SD1, SD2, SD3, SD4, SD5, SD6 and SD7 in Table 13-56. **Essential mitigation:** Periodic review of the Scheme (at construction, opening year and post opening) against defined sustainability objectives (generated through collaborative workshop inputs during Scheme development) to ensure that intended sustainability benefits are appropriately reviewed, evidenced, and recorded; and that continual improvement actions can be pursued through the establishment and implementation of a feedback loop. Weekly bulletins and feedback loop to respond to community concerns. Ensure that PLO communications include targeted information about how communities can move around to minimise disruption, reflecting the needs of community members; and that there is an effective mechanism for PLO to generate change in the Scheme in response to feedback once construction is underway, through the Compensation Event procedure (refer to mitigation ref. PHH4, PHH9 and PHH13).		

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		PLO to prioritise direct liaison with residents anticipated to experience direct impacts on access during the construction phase, to ensure that suitable access and egress to their property is available at all times during the construction phase (refer to mitigation ref. PHH11). Targeted engagement to secure continuity of access: directly affected residential receptors and businesses to be engaged by PLO to ensure specific access needs are understood and met throughout construction (refer to mitigation ref. PHH11 and PHH12). Contractor required to provide sufficient space (pavement width for example) to allow pedestrians, including wheelchair and pushchair users; and cyclists to travel safely through areas under traffic management (refer to mitigation ref. PHH18).			
	Outcome and residual effects assessment (effect + essential mitigation)	The overall health outcomes for the sub-population in relation to safety and access are negative. The overall health outcomes for vocational opportunities are positive. Safety: the essential mitigation includes feedback loops to instigate change in the Scheme related both to the periodic sustainability review and the work of the PLO in understanding and responding to issues as they emerge. In addition, there is a requirement for the contractor to accommodate people with additional mobility needs within the traffic management proposals in the interests of safety. Taking these essential mitigation measures into account, the residual effects assessment reduces the magnitude of the impact, but the resultant effect remains **moderate adverse, which is significant.** Access: the essential mitigation includes feedback loops to instigate change in the Scheme related both to the periodic sustainability review and the work of the PLO in understanding and responding to issues as they emerge. In addition, there is a requirement for effective advance communication of changes to access arrangements, in consultation with affected receptors and in recognition of the differing communication needs of the affected people; supported by temporary signage strategies to all community facilities for all modes. Taken together, these essential mitigations are considered to reduce the magnitude of impact, but the resultant effect remains **moderate adverse, which is significant.**			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		Vocational opportunities: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **moderate beneficial, which is significant.**			

Table 13-49 – Health outcomes of operational Scheme for the wider population and sub-populations

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
Wider Population: Urban context *Note: rural context less relevant once the Scheme is operational due to the urbanising role of the Scheme. Operational assessment is based on the lower sensitivity assigned to the urban context*	**Air quality:** reductions in concentrations of poor air quality due to improved traffic flow through the study area, along the A4019. Introduction of additional source of traffic and vehicle emissions at the Link Road. Increased vehicle emissions due to increased traffic volumes anticipated in future baseline (opening +15 years) in line with growth, which may be offset to some degree by improved technologies and uptake of electrical vehicles. **Soil and water pollution:** increase in potential sources of pollution from new transport infrastructure. **Safety**: reduced risk of conflict between different modes, due to modal separation within the	Low	**Air quality:** Opening year (OY): reduced risk to physical health, including respiratory and gastrointestinal problems and lower mental health outcomes due to reductions in concentrations of poor air quality, particularly along the A4019 corridor. Partly offset by increased emissions sources at link road. **Moderate beneficial magnitude** (medium scale, medium term duration, daily conditions, low changes in morbidity for wider population, large minority of population affected and gradual reversal/evolution of impacts over time) Future year (FY) – OY + 15 years: increased risk to physical health including respiratory and gastrointestinal problems and lower mental health outcomes due to increased traffic volumes within the Scheme and at the strategic sites that the Scheme delivers infrastructure for. This may be offset to some degree by a change in vehicle fuel mix. **Minor adverse magnitude** (small scale (localised), short term duration (due to evolving behaviours), minor change in morbidity for the wider population, small minority of population affected)	**Air quality:** OY: Slight beneficial (not significant) FY: Slight adverse (not significant) **Soil and water pollution:** OY and FY: slight adverse (not significant) **Safety**: OY and FY: Slight beneficial (not significant) **Access:** OY: Slight beneficial (not significant) FY: Moderate beneficial (significant) **Noise:**	**Air quality**: OY: Positive FY: Negative **Soil and water pollution:** OY and FY: negative **Safety**: OY and FY: Positive **Access**: OY and FY: positive **Noise**: OY: positive FY: negative **Landscape amenity:** OY and FY: Negative

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
	Scheme design. Increased flood attenuation within the Scheme design, removing flow paths to the north of the A4019 and reducing flood risk to properties within this part of the study area. **Access (vehicular and WCH access) to community facilities of all types**: OY: substantial improvements to access (vehicular, including public transport) via the A4019 through Scheme design/junction arrangements, bus infrastructure improvements and the provision of the Link Road, integrated with WCH enhancements via a segregated and extended network. May promote increased Active Travel uptake and behavioural change. FY: facilitation of strategic transport access via a range of modes to new		**Soil and water pollution:** OY and FY: negligible risk of encountering polluted soil or water through recreational activities; and in groundwater contamination. **Negligible adverse magnitude** (negligible exposure, very short term duration, one-off/unlikely events within strong control measures through design, small proportion of population would be affected by an event and rapid reversal anticipated) **Safety**: OY and FY: reduced risk of injury for the wider population using the Scheme by a range of modes through removal of modal conflicts and enhanced segregated WCH provision and networks. An individual's risk of injury may be influenced by many social, personal, economic, and environmental factors. Construction works will alter the landform, changing the water flow paths and reducing the risks of flooding throughout the study area. **Moderate beneficial magnitude** (medium scale, medium term duration design solution to safety and the management of flood risks, minor to major changes in morbidity and quality of life affecting a large minority of population) **Access:**	OY: Slight beneficial (not significant) FY: Slight adverse (not significant) **Landscape amenity:** OY: slight adverse (not significant) FY: moderate adverse (significant)	

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
	community facilities and assets within the strategic development sites that the Scheme delivers infrastructure for. **Noise**: reductions in concentrations of traffic noise due to improved traffic flow through the study area, along the A4019. Introduction of additional source of traffic at the Link Road. Increased vehicle noise due to increased traffic volumes anticipated in future baseline (opening +15 years) in line with growth, which may be offset to some degree by improved technologies and uptake of electrical vehicles (lower noise levels). **Landscape amenity:** introduction of transportation infrastructure at the landscape scale, which will have a more urban character.		OY: Enhancements to strategic highway network, WCH routes and public transport infrastructure and services (including an eastbound bus lane on the A4019), contributing to an increase in accessibility and provision for Active Travel, the latter to the benefit of physical health. Improvements in public transport accessibility and journey time reliability, plus addition of the Link Road may improve the ability of individuals to access services and facilities that support physical and mental health. **Moderate magnitude** (medium scale, medium term duration, affecting regular trips, moderate to major changes in quality of life, large minority of study area population affected). FY: Extension of the strategic highway network into and facilitating growth within the strategic development sites that the Scheme delivers infrastructure for. Improvements in accessibility to and availability of community assets important for health and wellbeing for the existing and prospective residents of the study area. **Major magnitude** (high exposure in the context of the study area, long-term, daily movement patterns, changes in morbidity due to behavioural change (Active Travel opportunities), majority of population affected and permanent change, new services provided).		

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
	Softening of the transportation infrastructure into the landscape as the environmental design (landscaping and biodiversity enhancement) matures and construction work sites return to previous or agreed use. Scheme will deliver infrastructure required to catalyse development of the strategic development sites, which will have a transformational urbanising impact on the landscape in the FY.		**Noise:** Opening year (OY): reduced risk to physical health, social and mental well-being associated with lower levels of sleep disturbance in the majority of the study area. Partly offset by increased noise emissions sources at link road. **Moderate beneficial magnitude** (medium scale, medium term duration, daily conditions, low changes in morbidity for wider population, large minority of population affected and gradual reversal/evolution of impacts over time) Future year (FY) – OY + 15 years: increased risk to physical health, social and mental well-being due to increased traffic volumes within the Scheme and at the strategic sites that the Scheme delivers infrastructure for. This may be offset to some degree by a change in vehicle fuel mix, noting that electric vehicles are much quieter than petrol or diesel powered vehicles. **Minor adverse magnitude** (small scale (localised), short term duration (due to evolving behaviours), minor change in morbidity for the wider population, small minority of population affected) **Landscape amenity:** OY: recovery of the landscape from the large scale construction site to the smaller		

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
			footprint of the permanent Scheme, which will appear as a set of linear urbanising features. At OY the infrastructure may continue to appear as incongruent with the wider landscape, particularly from more open parts of the study area. **Minor adverse magnitude** (small scale (localised), short term duration (due to evolving/maturing landscaping), minor change in quality of life and mental health (for some of the population) within the wider population, small minority of population affected) FY: the transport infrastructure of the Scheme will be embedded into the landscape through the maturing landscaping proposals. This will be off-set in some parts of the study area by the realisation of growth at the strategic development sites, which will have a transformational urbanising effect on the landscape. **Moderate adverse magnitude** (medium to high exposure, medium to long term duration, continuous frequency, moderate to major changes in quality of life and mental health (for some of the population), majority of study area population affected, permanent changes).		
	Summary of effects assessment	The Scheme design and embedded mitigation include a combination of approaches that will avoid and/or seek to control many of the factors that contribute to changes in determinants of health that will be relevant in the OY. Of particular relevance is securing the ongoing maintenance of the Scheme, particularly the effectiveness of the landscaping proposals; and ensuring that its benefits to people are effectively communicated when it opens. Between OY and FY, the interaction of the Scheme with the			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		strategic development sites will be influential – there are essential mitigation measures identified for CEA (see chapter 16 (~~a~~Application document TR010063/APP/6.13) that are intended to support the wider population through the longer term transition of the study area from strategic growth into a more urbanised location. The combinations of receptor sensitivity and impact magnitude result in the following assessments of significance for the impacts of the Scheme plus embedded mitigation on determinants of health. **Moderate beneficial and significant:** FY: access. **Slight beneficial and not significant**: OY: air quality; safety; access; noise. FY: safety. **Slight adverse and not significant**: OY: soil and water pollution; landscape amenity. FY: air quality; soil and water pollution; noise. **Moderate adverse and significant:** FY: landscape amenity.		
		Embedded mitigation: Refer to G1, G4, B9, WE22, LV8, GS4, PHH17, SD1, SD2, SD3, SD4, SD5, CEA1, CEA2 and CEA3 in Table 13-56. **Essential mitigation:** Periodic review of the Scheme (at construction, opening year and post opening) against defined sustainability objectives (generated through collaborative workshop inputs during		

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		Scheme development) to ensure that intended sustainability benefits are appropriately reviewed, evidenced, and recorded; and that continual improvement actions can be pursued through the establishment and implementation of a feedback loop. Effective information share regarding the improvements to accessibility, connectivity, and journey times, in accordance with the communication plan led by the PLO (refer to mitigation ref. PHH17). Minimising vegetation loss. Approach includes for detailed design process to seek to further reduce habitat loss and vegetation loss and secure maintenance in accordance with target condition (refer to mitigation ref. B9).			
	Outcome and residual effects assessment (effect + essential mitigation)	The overall health outcomes for the wider population are comprise a combination of positive and negative, with the situation evolving between OY and FY (due particularly to the influence of the anticipated development on the strategic sites for with the Scheme will provide essential transport infrastructure), as follows: **OY positive:** air quality, safety, access, noise. **OY negative:** soil and water pollution, landscape amenity. **FY positive:** safety, access. **FY negative:** air quality, soil and water pollution, noise, landscape amenity. **Air quality:** OY: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **slight beneficial (not significant).**			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		FY: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **slight adverse (not significant).** **Soil and water pollution:** no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment for OY and FY and is **slight adverse (not significant).** **Safety**: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment for OY and FY and is **slight beneficial (not significant).** **Access**: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **slight beneficial (not significant)** in OY and **moderate beneficial (significant)** in FY**.** **Noise:** OY: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **slight beneficial (not significant).** FY: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **slight adverse (not significant).** **Landscape amenity**: The essential mitigation includes feedback loops to instigate change in the Scheme related both to the periodic sustainability review and the work of the PLO in understanding and responding to issues as they emerge. There is also commitment to securing the management of the landscaping proposals to attain target conditions. This has the potential to address issues that may relate landscape amenity and human health; however, on the basis that these are currently undefined, a precautionary approach to assessment means that the residual assessment for OY		

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		remains **slight adverse (not significant)** and FY remains **moderate adverse, which is significant.**			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
Sub-populations Families with children and adolescents (pregnant and maternal women, babies, children, and adolescents) People who are physically or mentally disadvantaged (elderly people, people with physical disabilities, people with other health problems or impairments) People who are materially disadvantaged People from black and minority	**Air quality:** as per for the wider population. **Safety**: reduced risk of conflict between different modes, due to modal separation within the Scheme design. **Access (vehicular and WCH access) to community facilities of all types**: OY: substantial improvements to access (vehicular, including public transport) via the A4019 through Scheme design/junction arrangements, bus infrastructure improvements and the provision of the Link Road, integrated with WCH enhancements via a segregated and extended network. May promote increased Active Travel uptake and behavioural change. FY: facilitation of strategic transport access via a range of modes to new	High	**Air quality:** see wider population assessment **Safety**: OY and FY: reduced risk of injury for the wider population using the Scheme by a range of modes through removal of modal conflicts and enhanced segregated WCH provision and networks. An individual's risk of injury may be influenced by many social, personal, economic, and environmental factors. The amendments to safety on the WCH network may disproportionately benefit these sub-populations on the basis that they may have a greater reliance on non-car modes. **Moderate beneficial magnitude** (medium scale, medium term duration design solution to safety and the management of flood risks, minor to major changes in morbidity and quality of life affecting a large minority of population) **Access:** OY: Enhancements to strategic highway network, WCH routes and public transport services, including a bus lane on the eastbound A4019, contributing to an increase in accessibility and provision for Active Travel, the latter to the benefit of physical health. Improvements in public transport accessibility and journey time	**Safety**: OY and FY: Moderate beneficial (significant) **Access:** OY: Moderate beneficial (significant) FY: Large beneficial (significant) **Noise:** OY: Slight beneficial (not significant) FY: Slight adverse (not significant) **Landscape amenity:** OY: slight adverse (not significant) FY: slight adverse (not significant)	**Safety**: OY and FY: Positive **Access**: OY and FY: positive **Noise**: OY: positive FY: negative **Landscape amenity:** OY and FY: Negative

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
ethnic backgrounds	community facilities and assets within the strategic development sites that the Scheme delivers infrastructure for. **Noise**: as per for the wider population **Landscape amenity:** as per for the wider population		reliability, plus addition of the Link Road may improve the ability of individuals to access services and facilities that support physical and mental health. **Moderate magnitude** (medium scale, medium term duration, affecting regular trips, moderate to major changes in quality of life, large minority of study area population affected). FY: Extension of the strategic highway network into and facilitating growth within the strategic development sites that the Scheme delivers infrastructure for. Improvements in accessibility to and availability of community assets important for health and wellbeing for the existing and prospective residents of the study area – this may disproportionately benefit people in these sub-populations who tend to have a greater reliance on facilities close to their homes, thus increased choices and proximity will be beneficial. **Major magnitude** (high exposure in the context of the study area, long-term, daily movement patterns, changes in morbidity due to behavioural change (Active Travel opportunities), majority of population affected and permanent change, new services provided). **Noise:** see wider population assessment		

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
			Landscape amenity: see wider population assessment		
	Summary of effects assessment	The Scheme design and embedded mitigation include a combination of approaches that will avoid and/or seek to control many of the factors that contribute to changes in determinants of health that will be relevant in the OY. Of particular relevance is securing the ongoing maintenance of the Scheme; and ensuring that its benefits to people are effectively communicated when it opens. Between OY and FY, the interaction of the Scheme with the strategic development sites will be influential – there are essential mitigation measures identified for CEA (see chapter 16 (Aapplication document TR010063/APP/6.13) that are intended to support the wider population through the longer term transition of the study area from strategic growth into a more urbanised location. The combinations of receptor sensitivity and impact magnitude result in the following assessments of significance for the impacts of the Scheme plus embedded mitigation on determinants of health. **Large beneficial and significant:** FY: access. **Moderate beneficial and significant**: OY: safety; access. FY: safety.		
		Embedded mitigation: Refer to G1, G4, B9, WE22, LV8, GS4, PHH17, SD1, SD2, SD3, SD4, SD5, CEA1 and CEA2 in Table 13-56. **Essential mitigation:** Periodic review of the Scheme (at construction, opening year and post opening) against defined sustainability objectives (generated through collaborative workshop inputs during Scheme development) to ensure that intended sustainability benefits are appropriately reviewed,			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		evidenced, and recorded; and that continual improvement actions can be pursued through the establishment and implementation of a feedback loop. Effective information share regarding the improvements to accessibility, connectivity, and journey times, in accordance with the communication plan led by the PLO (refer to mitigation ref. PHH17).			
	Outcome and residual effects assessment (effect + essential mitigation)	The overall health outcomes for the wider population are positive for safety and access. **Safety:** no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **moderate beneficial (significant)** in OY and FY. **Access**: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **moderate beneficial (significant)** in OY and **large beneficial (significant)** in FY**.**			

Geographical sub-populations

Table 13-50 – Health outcomes of construction activities for geographical sub-groups

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
Residents of properties at north-west Cheltenham (South of the A4019/Princess Elizabeth Way roundabout – St Peters) Residents of properties within Springbank	Physical, mental health and well-being outcomes from: - Access: Temporary closure, modification or diversion of local roads, public transport and WCH affecting access to local assets supporting physical and mental health and well-being. As per the wider population assessment: - Air quality - Soil and water pollution - Safety - Noise - Separation from open space and recreational routes - Landscape amenity	Medium	**Access:** Loss of access to public transport, temporary closure, modifications or diversions to local roads and disruptions to WCH. This will cause disruptions to normal journeys (increasing journey complexity or delays) arising from construction activities and as an area under traffic management with resulting health and wellbeing outcomes, such as reduced participation in social activities. Increased queuing and congestion may occur as vehicle users are redirected away from construction works towards the A4013. **Moderate adverse magnitude** (medium scale, medium term duration, affecting regular trips, moderate changes to quality of life, gradual reversal).	**Access**: Moderate adverse (significant)	**Access:** Negative
	Summary of health outcome assessment and effects assessments	The Scheme design and embedded mitigation include a combination of approaches that will avoid and/or seek to control many of the factors that contribute to changes in determinants of health. Of particular relevance are the controls on traffic management, sources of pollution and the expectations of the appointment and activities of the PLO, of which are set out within the EMP; coupled with the combined			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		environmental design, which draws together landscape and noise attenuation (together with biodiversity and flood risk management). This results in the following assessments of significance for the impacts of the Scheme plus embedded mitigation on determinants of health: Moderate adverse and significant: Access			
		Embedded mitigation: Refer to G1, G2, G3, G4, G10, PHH2, PHH3, PHH4, PHH5, PHH9, PHH11, PHH18 and SD7 in Table 13-56. **Essential mitigation:** Weekly bulletins and feedback loop to respond to community concerns. Ensure that PLO communications include targeted information about how communities can move around to minimise disruption; and that there is an effective mechanism for PLO to generate change in the Scheme in response to feedback once construction is underway, through the Compensation Event procedure (refer to mitigation ref. PHH4, PHH9 and PHH13). PLO to prioritise direct liaison with residents anticipated to experience direct impacts on access during the construction phase, to ensure that suitable access and egress to their property is available at all times during the construction phase (refer to mitigation ref. PHH11).			
	Outcome and residual effects assessment (effect + essential mitigation)	The predicted health outcome is negative. Access: The essential mitigation includes feedback loops to instigate change in the Scheme related both to the periodic sustainability review and the work of the PLO in understanding and responding to issues as they emerge. In addition, there is a requirement for effective advance communication of changes to access arrangements, in consultation with affected receptors; supported by temporary signage strategies to all community facilities for all modes. Taken together, these essential mitigations are			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		considered to reduce the magnitude of impact to minor such that the residual effects assessment is **slight adverse, which is not significant.**			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
Residents of properties at Uckington, Moat Lane and Cooks Lane	Physical, mental health and well-being outcomes from: - Access: Temporary closure, modification, or diversion of local roads and WCH and access to public transport, as well as access to local assets supporting physical and mental health and well-being - Landscape amenity: Associated with the changing characteristics of the landscape with newly exposed views and the transition of land in the Order limits to a large scale construction site.	High	**Access:** Loss of access to public transport, temporary closure, modifications or diversions to local roads and disruptions to WCH. This will cause disruptions to normal journeys (increasing journey complexity or delays) and the loss or amended access to residential properties arising from construction activities with resulting health and wellbeing outcomes. **Moderate adverse magnitude** (medium scale, medium term duration affecting regular trips, major changes to quality of life, majority of the population affected). **Landscape amenity:** Change in the character of the landscape from an established transport network in a semi-rural context to an area of major construction and focus for change enduring for around 24 months, resulting in health and wellbeing outcomes. The reduction in amenity may affect the physical health (i.e. limiting the opportunity to enjoy spending time outdoors or community facilities, particularly those with recreational and healthcare roles) and for those with mental health conditions where socialising and maintaining routine are	Access: Moderate adverse (significant) Landscape: Very large adverse (significant)	Negative Temporary, indirect, and reversible or evolving, with most limited to construction phase

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
	As per the wider population assessment: - Air quality - Safety - Noise - Separation from open space and recreational routes		known to have benefits. **Major adverse magnitude** (high exposure, long-term duration, continuous frequency, permanent and evolving changes, majority of the population affected, major changes to quality of life).		
	Summary of health outcome assessment and effects assessments	The Scheme design and embedded mitigation include a combination of approaches that will avoid and/or seek to control many of the factors that contribute to changes in determinants of health. Of particular relevance are the controls on traffic management, sources of pollution and the expectations of the appointment and activities of the PLO, of which are set out within the EMP; coupled with the combined environmental design, which draws together landscape and noise attenuation (together with biodiversity and flood risk management). The temporary changes and loss of access has been assessed as a moderate adverse magnitude of impact. When combined with the high sensitivity DMRB LA104 allows for the selection of moderate or large adverse effects. In this instance, moderate adverse effects have been concluded, reflecting the considerable scope of controls on relevant matters set out in the EMP. The changes in landscape amenity have been assessed as a major adverse magnitude of impact. When combined with the high sensitivity DMRB LA104 allows for the selection of large or very large adverse effects. The higher band has been selected for landscape amenity as the rural character of the village will evolve into a large scale construction site, which cannot be visually screened. Residents will have long term and high exposure to the construction works. This results in the following assessments of significance for the impacts of the Scheme plus embedded mitigation on determinants of health: Moderate adverse and significant: Access			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		Very large adverse and significant: Landscape			
		Embedded mitigation: Refer to G1, G2, G3, G4, G10, B6, LV1, LV2, LV3, LV8, PHH2, PHH3, PHH4, PHH5, PHH6, PHH7, PHH9, PHH11, PHH15, PHH16, PHH18 and SD6. **Essential mitigation:** Weekly bulletins and feedback loop to respond to community concerns. Ensure that PLO communications include targeted information about how communities can move around to minimise disruption; and that there is an effective mechanism for PLO to generate change in the Scheme in response to feedback once construction is underway, through the Compensation Event procedure (refer to mitigation ref. PHH4, PHH9 and PHH13). PLO to prioritise direct liaison with residents anticipated to experience direct impacts on access during the construction phase, to ensure that suitable access and egress to their property is available at all times during the construction phase (refer to mitigation ref. PHH11). Targeted engagement with local residents along A4019 to influence construction sequencing and any additional mitigation measures (for landscape amenity, noise and air quality as well as access), which may evolve once the Scheme is under construction (refer to mitigation ref. PHH16). Provide temporary signalised crossing facilities on the A4019 at Uckington during the construction phase, as part of the traffic management plan (refer to mitigation ref. PHH5). Minimising vegetation loss. Approach includes for detailed design process to seek to further reduce habitat loss and vegetation loss (refer to mitigation ref. B6 and LV2).			
	Outcome and residual effects assessment (effect + essential mitigation)	The predicted health outcome is negative for access and landscape amenity impacts. Access: The essential mitigation includes feedback loops to instigate change in the Scheme related both to the periodic sustainability review and the work of the PLO in understanding and responding to issues as they emerge. In addition, there is a requirement for effective advance communication of changes to access arrangements, in			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		consultation with affected receptors; supported by temporary signage strategies to all community facilities for all modes. Taken together, these essential mitigations are considered to reduce the magnitude of impact to minor adverse; however, the residual effects assessment remains **moderate adverse, which is significant.** Landscape amenity: The essential mitigation includes feedback loops to instigate change in the Scheme related both to the periodic sustainability review and the work of the PLO in understanding and responding to issues as they emerge. There is also commitment that to exploring additional vegetation retention as part of the detailed design process and working directly with affected communities to refine proposals. This has the potential to address issues that may relate landscape amenity and human health; however, on the basis that these are currently undefined, a precautionary approach to assessment means that the residual assessment remains **very large adverse, which is significant.**		

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
Residents of properties adjacent to the B4634 (includes Hayden)	Physical, mental health and well-being outcomes from: - Temporary closure, modification or diversion of local roads and WCH and access to public transport for a prolonged period affecting access to local assets supporting physical and mental health and well-being. - Change in landscape characteristics associated with Link Road construction works. As per the wider population assessment: - Air quality - Noise - Separation from open and recreational routes	Medium	**Access:** Loss of access to public transport, temporary closure, modifications or diversions to local roads and disruptions to WCH. This will cause disruptions to normal journeys (increasing journey complexity or delays) and the loss or amended access to residential properties arising from construction activities with resulting health and wellbeing outcomes. **Moderate adverse magnitude** (medium scale, medium term duration affecting regular trips, moderate to major changes to quality of life, large minority of residents) **Landscape amenity:** Change in the character of the landscape from an established transport network in a semi-rural agricultural context to an area of major construction associated with the Link Road and focus for change resulting in health and wellbeing outcomes. The reduction in amenity may affect the physical health (i.e. limiting the opportunity to enjoy spending time outdoors or community facilities, particularly those with recreational and healthcare roles) and for those with mental health conditions where socialising and maintaining routine are known to have benefits. **Major adverse magnitude** (high exposure, long-term duration, continuous frequency, permanent and evolving changes, major changes to quality of life).	Access: moderate adverse Landscape: moderate adverse	Negative

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
	Summary of health outcome assessment and effects assessments	The Scheme design and embedded mitigation include a combination of approaches that will avoid and/or seek to control many of the factors that contribute to changes in determinants of health. Of particular relevance are the controls on traffic management, sources of pollution and the expectations of the appointment and activities of the PLO, of which are set out within the EMP; coupled with the combined environmental design, which draws together landscape and noise attenuation (together with biodiversity and flood risk management). The change in landscape amenity has been assessed as a moderate adverse impact. When combined with the medium sensitivity DMRB LA104 allows for the selection of moderate or large adverse effects. In this instance, moderate adverse effects have been concluded based on the existing role of linear transportation infrastructure within this semi-rural landscape, whilst also noting the nature of these properties and proximity to the Link Road construction area. This results in the following assessments of significance for the impacts of the Scheme plus embedded mitigation on determinants of health: Moderate adverse: Access and landscape amenity.			
		Embedded mitigation: Refer to G1, G2, G3, G4, G10, B6, LV1, LV2, LV3, LV8, PHH2, PHH3, PHH4, PHH5, PHH6, PHH7, PHH9, PHH11, PHH15, PHH16 and PHH18. **Essential mitigation:** Weekly bulletins and feedback loop to respond to community concerns. Ensure that PLO communications include targeted information about how communities can move around to minimise disruption; and that there is an effective mechanism for PLO to generate change in the Scheme in response to feedback once construction is underway, through the Compensation Event procedure (refer to mitigation ref. PHH4, PHH9 and PHH13).			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		PLO to prioritise direct liaison with residents anticipated to experience direct impacts on access during the construction phase, to ensure that suitable access and egress to their property is available at all times during the construction phase (refer to mitigation ref. PHH11). Provide temporary signalised crossing facilities on the A4019 at Uckington during the construction phase, as part of the traffic management plan (refer to mitigation ref. PHH5). Minimising vegetation loss. Approach includes for detailed design process to seek to further reduce habitat loss and vegetation loss (refer to mitigation ref. B6 and LV2).			
	Outcome and residual effects assessment (effect + essential mitigation)	The predicted health outcome is negative for access and landscape amenity impacts. Access: The essential mitigation includes feedback loops to instigate change in the Scheme related both to the periodic sustainability review and the work of the PLO in understanding and responding to issues as they emerge. In addition, there is a requirement for effective advance communication of changes to access arrangements, in consultation with affected receptors; supported by temporary signage strategies to all community facilities for all modes. Taken together, these essential mitigations are considered to reduce the magnitude of impact to minor such that the residual effects assessment is **slight adverse, which is not significant.** The essential mitigation includes feedback loops to instigate change in the Scheme related both to the periodic sustainability review and the work of the PLO in understanding and responding to issues as they emerge. There is also commitment that to exploring additional vegetation retention as part of the detailed design process and working directly with affected communities to refine proposals. This has the potential to address issues that may relate landscape amenity and human health; however, on the basis that these are currently undefined, a precautionary approach to assessment means that the residual assessment remains **moderate adverse, which is significant.**			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
Residents of properties at Homecroft Drive and Appleyard Close (north)	Physical, mental health and well-being outcomes from: - Demolition: Demolition of semi-detached properties and relocation of residents - Access: Temporary closure, modification, or diversion of local roads and WCH and access to public transport for a prolonged period including access to local assets supporting physical and mental health and well-being As per the wider population assessment: - Landscape amenity - Noise - Air quality - Safety - Separation from open space and recreational routes	High	**Demolition:** Demolition of properties will have a direct mental health impact on affected residents who will experience the loss of their home and concerns around relocating elsewhere. The loss of properties and residents will result in a lost sense of community for the remaining residents. **Major adverse magnitude** (high scale, permanent, severity linked to changes in mental health, affected rural communities will experience substantial loss/change as a percentage of total population) **Access:** Loss of access to public transport, temporary closure, modifications or diversions to local roads and disruptions to WCH. This will cause disruptions to normal journeys and the loss or amended access to residential properties arising from construction activities with resulting health and wellbeing outcomes, such as reduced participation in social activities. **Moderate adverse magnitude** (medium scale, medium term duration, affecting regular trips, moderate to major changes in quality of life, majority of residents affected, gradual reversal).	**Demolition:** Very large adverse (significant) **Access:** Moderate adverse significant	Demolition: Negative Access: Negative
	Summary of health outcome assessment and effects assessments	The Scheme design and embedded mitigation include a combination of approaches that will avoid and/or seek to control many of the factors that contribute to changes in determinants of health. Of particular relevance are the controls on sources of pollution and the expectations of the appointment and activities of the PLO, both of which are set out within the EMP; coupled with the combined environmental design, which			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		draws together landscape and noise attenuation (together with biodiversity and flood risk management). The Scheme design also incorporates specific access improvements for the properties within this receptor cluster. The combination of receptor sensitivity and impact magnitude offers the choice between two categories of effects significance for the adverse effects (as per DMRB LA104). In this instance the higher band has been selected as impacts for demolition, as compensation through the CPO process cannot fully mitigate the anxiety or stress associated with the loss of a home and relocating elsewhere. The lost sense of community also cannot be mitigated. The lower band has been selected for access impacts, reflecting the considerable scope of controls on relevant matters set out in the EMP, coupled with the targeted access improvements within the Scheme design. This results in the following assessments of significance for the impacts of the Scheme plus embedded mitigation on determinants of health: Very large adverse: Demolition Moderate adverse: Access			
		Embedded mitigation: Refer to G1, G2, G3, G4, G10, PHH2, PHH3, PHH4, PHH5, PHH6, PHH7, PHH9, PHH11, PHH15, PHH16, PHH18 and SD6. **Essential mitigation:** Weekly bulletins and feedback loop to respond to community concerns. Ensure that PLO communications include targeted information about how communities can move around to minimise disruption; and that there is an effective mechanism for PLO to generate change in the Scheme in response to feedback once			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		construction is underway, through the Compensation Event procedure (refer to mitigation ref. PHH4, PHH9 and PHH13). Targeted engagement with local residents along A4019 to influence construction sequencing and any additional mitigation measures (for landscape amenity, noise and air quality as well as access), which may evolve once the Scheme is under construction (refer to mitigation ref. PHH16).			
	Outcome and residual effects assessment (effect + essential mitigation)	The overall health outcome for this sub-group is negative. Demolition: No additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **very large adverse (significant)**. Directly affected property owners will be compensated through the CPO process. Access: The essential mitigation includes feedback loops to instigate change in the Scheme related both to the periodic sustainability review and the work of the PLO in understanding and responding to issues as they emerge. In addition, there is a requirement for effective advance communication of changes to access arrangements, in consultation with affected receptors; supported by temporary signage strategies to all community facilities for all modes. Taken together, these essential mitigations are considered to reduce the magnitude of impact to minor adverse**,** however, given the receptor sensitivity the residual effects remain **moderate adverse and significant.**			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
Residents of properties at Withybridge Gardens and Stanboro Lane (including Sheldon Cottages) and Withybridge Lane (around the M5 Junction 10)	Physical, mental health and well-being outcomes from: - Demolition: Demolition of properties and relocation of residents - Loss of landscape amenity of surroundings due to transition of the land in the Order limits to a large-scale construction site Other impacts as per the wider population assessment: - Air quality - Soil and water pollution - Safety - Noise - Separation from open space and recreational routes	High	**Demolition:** Demolition of properties will have a direct mental health impact on affected residents who will experience the loss of their home and concerns around relocating elsewhere. The loss of properties and residents will result in a lost sense of community for the remaining residents. **Major adverse magnitude** (high scale, permanent, severity linked to changes in mental health, affected rural communities will experience substantial loss/change as a percentage of total population). **Landscape amenity:** Changed landscape amenity and character from an established transport network in a semi-rural context to an area of major construction and focus for change enduring for around 24 months, resulting in health and wellbeing outcomes. **Major adverse magnitude** (high exposure, long-term duration, continuous frequency, permanent and evolving changes, majority of the population affected, major changes to quality of life).	**Demolition:** Very large adverse (significant) **Landscape amenity:** Very large adverse	**Demolition:** Negative **Landscape:** Negative

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
	Summary of health outcome assessment and effects assessments	The Scheme design and embedded mitigation include a combination of approaches that will avoid and/or seek to control many of the factors that contribute to changes in determinants of health. Of particular relevance are the controls on sources of pollution and the expectations of the appointment and activities of the PLO, both of which are set out within the EMP; coupled with the combined environmental design, which draws together landscape and noise attenuation (together with biodiversity and flood risk management). The combination of receptor sensitivity and impact magnitude offers the choice between two categories of effects significance for the adverse effects (as per DMRB LA104). In this instance the higher band has been selected as impacts for demolition, as compensation through the CPO process cannot fully mitigate the anxiety or stress associated with the loss of a home and relocating elsewhere. The lost sense of community also cannot be mitigated. The change in landscape amenity has been assessed as a major adverse impact. When combined with the high sensitivity DMRB LA04 allows for the selection of large or very large adverse effects. In this instance, very large adverse effects have been concluded based on the proximity of these properties relative to the parts of the transport network that will be subject to transformational and urbanising change. This results in the following assessments of significance for the impacts of the Scheme plus embedded mitigation on determinants of health: Very large adverse: demolition and landscape amenity.			
		Embedded mitigation: Refer to G1, G2, G3, G4, B6, LV1, LV2, LV3 and LV6. **Essential mitigation:** Minimising vegetation loss. Approach includes for detailed design process to seek to further reduce habitat loss and vegetation loss (refer to mitigation ref. B6 and LV2). The residents of the two properties at Sheldon Cottages (located on Stanboro Lane) will relocate to other accommodation during the construction phase. The cottages will be re-occupied on completion of			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		construction by the existing residents (pre-construction), or new residents. Whilst Sheldon Cottages and gardens are within the Order limits the cottages and gardens will be protected and maintained during the construction period so that they can be re-occupied on completion of construction (refer to mitigation ref. G12).			
	Outcome and residual effects assessment (effect + essential mitigation)	The overall health outcome for this sub-group is negative for demolition and landscape amenity impacts. Demolition: No additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **very large adverse (significant)**. Directly affected property owners will be compensated through the CPO process. Landscape: The essential mitigation includes feedback loops to instigate change in the Scheme related both to the periodic sustainability review and the work of the PLO in understanding and responding to issues as they emerge. There is also commitment to exploring additional vegetation retention as part of the detailed design process and working directly with affected communities to refine proposals. This has the potential to address issues that may relate landscape amenity and human health; however, on the basis that these are currently undefined, a precautionary approach to assessment means that the residual assessment remains **very large adverse, which is significant.**			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
Residents of properties at Swindon Village	Physical, mental health and well-being outcomes from: - Access: Temporary closure, modification or diversion of local roads, public transport and WCH affecting access to local assets supporting physical and mental health and well-being. As per the wider population assessment: - Air quality - Soil and water pollution - Safety - Noise - Landscape amenity	Low	**Access:** Loss of access to public transport, temporary closure, modifications or diversions to local roads and disruptions to WCH. This will cause disruptions to normal journeys (increasing journey complexity or delays) arising from construction activities and as an area under traffic management with resulting health and wellbeing outcomes, such as reduced participation in social activities. **Moderate adverse magnitude** (medium scale, medium term duration, affecting regular trips, moderate changes to quality of life, gradual reversal).	**Access**: Slight adverse (not significant)	**Access:** Negative
	Summary of health outcome assessment and effects assessments	The Scheme design and embedded mitigation include a combination of approaches that will avoid and/or seek to control many of the factors that contribute to changes in determinants of health. Of particular relevance are the controls on traffic management, sources of pollution and the expectations of the appointment and activities of the PLO, of which are set out within the EMP; coupled with the combined environmental design, which draws together landscape and noise attenuation (together with biodiversity and flood risk management). This results in the following assessments of significance for the impacts of the Scheme plus embedded mitigation on determinants of health:			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		Slight adverse and not significant: Access			
		Embedded mitigation: Refer to G1, G2, G3, G4, G10, PHH2, PHH3, PHH4, PHH5, PHH9, PHH13, PHH18 and SD7 in Table 13-56. **Essential mitigation:** Weekly bulletins and feedback loop to respond to community concerns. Ensure that PLO communications include targeted information about how communities can move around to minimise disruption; and that there is an effective mechanism for PLO to generate change in the Scheme in response to feedback once construction is underway, through the Compensation Event procedure (refer to mitigation ref. PHH4, PHH9 and PHH13). PLO to prioritise direct liaison with residents anticipated to experience direct impacts on access during the construction phase, to ensure that suitable access and egress to their property is available at all times during the construction phase (refer to mitigation ref. PHH11).			
	Outcome and residual effects assessment (effect + essential mitigation)	The overall health outcome for this sub-group is negative. Access: The essential mitigation includes feedback loops to instigate change in the Scheme related both to the periodic sustainability review and the work of the PLO in understanding and responding to issues as they emerge. In addition, there is a requirement for effective advance communication of changes to access arrangements, in consultation with affected receptors; supported by temporary signage strategies to all community facilities for all modes. Taken together, these essential mitigations are considered to reduce the magnitude of impact to minor adverse; however, the residual effects assessment remains **slight adverse, which is not significant.**			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
Users of the PRoW / WCH network within the Order limits and connecting part of the study area	Physical and mental health and wellbeing outcomes from: - Access/ separation from open space and recreational routes: temporary closure, or diversion of WCH routes resulting in reduced access and increases in journey complexity or length. - Landscape amenity: Loss of amenity of surroundings due to transition of the land in the Order limits to a large-scale construction site - Safety: Increased risk of injury due to the increased risk of conflict between modes. As per the wider population assessment: - Air quality - Soil and water pollution	High	**Separation from open space and recreational routes:** Temporary closures, diversions, and disruptions to WCH routes providing recreational access through the study area will reduce the access to rural parts of the study area and availability of open spaces (where work sites and the Link Road will be sited) **Moderate adverse magnitude** (medium scale, medium term duration, affecting regular trips, moderate changes to quality of life, gradual reversal). **Access:** Temporary closures and disruptions to WCH will result in increases in journey complexity and may contribute to the reduction in Active Travel to the detriment to physical health. **Moderate adverse magnitude** (medium scale, medium term duration, affecting regular trips, moderate changes to quality of life, gradual reversal). **Landscape amenity**: Reduction in landscape amenity (e.g. green and open spaces, areas along WCH routes) due to the presence of construction works and attendant visual changes, noise, vibration and additional pollutant sources. The loss of amenity may induce some level of anxiety or stress for WCH users and may result in a reduction in reduction in Active Travel and other outdoor activities to the detriment to physical health. **Major**	Separation from open space and recreational routes: Moderate adverse (significant) Access: Moderate adverse (significant) Landscape amenity: Large adverse (significant) Safety: Moderate adverse (significant)	Access: Negative Amenity: Negative Safety: Negative

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
	- Noise - Access		**adverse magnitude** (medium to high exposure, medium to long term duration, continuous frequency, moderate to major changes in quality of life and mental health). **Safety:** Increased risk of injury or loss of life from construction traffic, increased traffic levels and poor awareness of altered traffic movements. Unfamiliar layouts and temporary surfacing within traffic managed areas may also increase the risk of injury through trips or slips. **Moderate adverse magnitude** (medium scale, medium term duration for controls, daily movement through area, minor changes in morbidity and quality of life affecting a large minority of population, gradual reversal as Scheme is implemented).		
	Summary of health outcome assessment and effects assessments	The Scheme design and embedded mitigation include a combination of approaches that will avoid and/or seek to control many of the factors that contribute to changes in determinants of health. Of particular relevance are the controls on sources of pollution and the expectations of the appointment and activities of the PLO, both of which are set out within the EMP; coupled with the combined environmental design, which draws together landscape and noise attenuation (together with biodiversity and flood risk management). The EMP also includes requirements and commitments relating to the continued provision of WCH routes, through temporary diversions and this is taken into consideration in the assessment. The combinations of receptor sensitivity and impact magnitude offer the choice between two categories of effects significance (as per DMRB LA104). In this instance, the lower band had been selected for access, landscape, and safety effects, reflecting the considerable scope of controls on relevant matters set out in the EMP. For the separation from open spaces and recreational routes, the assessment considers that most PRoW routes within the study area and the reduced availability of open spaces due to construction works cannot be mitigated; however, the EMP will prevent the full closure of recreational routes or ensure that			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		diversion routes are of a suitable length – the lower band has therefore been selected for this impact category as well. The combinations of receptor sensitivity and impact magnitude result in the following assessments of significance for the impacts of the Scheme plus embedded mitigation on determinants of health: Moderate adverse and significant: separation from open space and recreational routes, access, and safety Large adverse and significant: Landscape amenity.			
		Embedded mitigation: Refer to G1, G2, G3, G4, G10, B6, LV1, LV2, PHH1, PHH2, PHH3, PHH4, PHH5, PHH6, PHH9, PHH11, PHH12, PHH13, PHH15 and PHH18. **Essential mitigation:** A clear and consistent signage strategy will be designed and implemented, to direct WCH during construction and support access to community and recreational facilities; and bus stop provision, using footpaths and cycleways (refer to mitigation PHH2). Users of affected PRoW, footpaths and cycleways should be notified of planned diversions (including via information required as part of the Community Engagement Plan (PHH4)), with signs along sections to be closed during construction, at least one month prior to the works (refer to mitigation PHH5). Contractor to provide sufficient space (pavement width for example) to allow pedestrians, including wheelchair and pushchair users; and cyclists to travel safely through areas under traffic management (refer to mitigation PHH18).			
	Outcome and residual effects assessment (effect + essential mitigation)	The overall health outcome for this sub-group is negative for separation/severance, access, landscape amenity and safety impacts.			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		Separation from open space and recreational routes: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **moderate adverse (significant).** **Landscape amenity:** the essential mitigation includes feedback loops to instigate change in the Scheme related both to the periodic sustainability review and the work of the PLO in understanding and responding to issues as they emerge. There is also commitment to exploring additional vegetation retention as part of the detailed design process and working directly with affected communities to refine proposals. This has the potential to address issues that may relate landscape amenity and human health; however, on the basis that these are currently undefined, a precautionary approach to assessment means that the residual assessment remains **large adverse, which is significant**. Access: The essential mitigation includes feedback loops to instigate change in the Scheme related both to the periodic sustainability review and the work of the PLO in understanding and responding to issues as they emerge. In addition, there is a requirement for effective advance communication of changes to access arrangements, in consultation with affected receptors; supported by temporary signage strategies to all community facilities for all modes. However, diversions for all affected PRoW have not been identified and therefore, the residual effects assessment remains unchanged from the main assessment and is **moderate adverse (significant).** Safety: No additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **moderate adverse (significant).**		

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
Construction workers working within Site Compounds and the Scheme Works Area	Physical and mental health and wellbeing outcomes from: - Safety: Risks to human health, linked to criminal behaviours which could result in on-site conflicts and threats of violence and in turn personal injury. Increased risk to human health undertaking construction works particularly during utilities diversions or installations. - Vocational opportunities: construction activity will generate employment and training opportunities. As per the wider population assessment: - Air quality	Medium	**Safety:** Any conflict, damage, leaks and/or blocks to utility network have the potential to increase risk to human health. There is also a risk of injury or loss of life for construction workers from explosion or asphyxiation or other effects from leaks or damaged utilities as well as from criminal behaviours or threats of violence. **Minor adverse magnitude** (medium scale, medium term duration for controls, controls should limit to occasional events/design solution to the management of flood risks, minor changes in morbidity and quality of life affecting a small minority of population, rapid reversal expected in response to any issue) **Vocational opportunities:** Increased and varied opportunities for suitably qualified people to gain vocational training and employment through construction work job roles. **Minor beneficial magnitude** (small scale relative to the population, moderate change in quality of life for a small minority of the population).	Safety: Slight adverse effect (not significant) Vocational opportunities Slight beneficial effect (not significant)	Safety: negative Vocational opportunities: positive

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
	- Soil and water pollution - Noise				
	Summary of health outcome assessment and effects assessments	The Scheme design and embedded mitigation include a combination of approaches that will avoid and/or seek to control many of the factors that contribute to changes in determinants of health. Of particular relevance are the controls on sources of pollution and the expectations of the appointment and activities of the Principal Contractor in relation to the safety and security of activities, both of which are set out within the EMP. The combinations of receptor sensitivity and impact magnitude result in the following assessments of significance for the impacts of the Scheme plus embedded mitigation on determinants of health: Slight adverse and not significant: safety. Slight beneficial and not significant: vocational opportunities			
		Embedded mitigation: Refer to mitigation ref. C1, G1, G2, G3, G4, GS3, GS4, WE16-18, PHH1, PHH7, PHH9 and PHH14 in Table 13-56. **Essential mitigation:** - Contractor to develop and implement an emergency vehicle movement plan as part of traffic management along the A4019 during construction. This will need to apply to all emergency vehicles seeking to move through the Order limits under Blue Lights, and also egress from West Cheltenham Fire Station for emergency response vehicles (refer to mitigation ref. PHH1). - The Environment Agency flood warning system will be adopted during construction. A suitable flood management plan should be put in place to ensure effective and safe evacuation of			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		personnel (plant and materials if safe to do so) from the areas at risk on receipt of a flood warning (refer to mitigation ref. WE16-18). - The construction phase may be a source of employment for local people. In addition to the requirement for the contractor to commit to hosting a meet the contractor supply chain event, recruitment should be supported through local job centres. GCC will expect the PC to incorporate measures to use the local supply chain effectively and including these as part of social value tender evaluation criteria (refer to mitigation ref. PHH14).			
	Outcome and residual effects assessment (effect + essential mitigation)	The predicted health outcome for safety is negative. The predicted health outcome for vocational opportunities is positive. Safety: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **slight adverse (not significant)**. Vocational opportunities: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **slight beneficial (not significant).**			

Table 13-51 – Health outcomes of the operational Scheme relating to for geographical sub-groups

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
- Residents of properties at north-west Cheltenham (South of the A4019/Princess Elizabeth Way roundabout – St Peters) - Residents of properties within Springbank	Health and wellbeing outcomes from: - Access: Improvements to access via the A4019 through Scheme design / junction arrangements, bus infrastructure improvements and the provision of the Link Road integrated with WCH enhancements via a segregated and extended network. As per the wider population (operational Scheme): - Air quality - Safety - Noise	Medium	**Access:** OY: Enhancements to strategic highway network, WCH routes and public transport services, including a bus lane on the eastbound A4019, contributing to an increase in accessibility and provision for Active Travel, the latter to the benefit of physical health. Improvements in public transport accessibility and journey time reliability, plus addition of the Link Road may improve the ability of individuals to access services and facilities that support physical and mental health. **Moderate beneficial magnitude** (medium scale, medium term duration, affecting regular trips, moderate to major changes in quality of life, large minority of study area population affected). FY: The Scheme will facilitate the growth within the strategic development sites that the Scheme delivers infrastructure for. Improvements in the accessibility and availability of community assets important for health and wellbeing for the existing and prospective residents of the study area. **Major beneficial magnitude** (high exposure in the context of the study area, long-term, daily movement patterns, changes in morbidity due to behavioural change (Active Travel opportunities), majority of population affected and permanent change, new services provided).	Access: OY: Moderate beneficial (significant) FY: Moderate beneficial (significant)	Access: OY and FY Positive

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
	Summary of health outcome assessment and effects assessments	The Scheme design and embedded mitigation include a combination of approaches that will avoid and/or seek to control many of the factors that contribute to changes in determinants of health that will be relevant in the OY. Of particular relevance is securing the ongoing maintenance of the Scheme and ensuring that its benefits to people are effectively communicated when it opens. Between OY and FY, the interaction of the Scheme with the strategic development sites will be influential – there are essential mitigation measures identified for CEA (see chapter 16 (Aapplication document TR010063/APP/6.13) that are intended to support the wider population through the longer term transition of the study area from strategic growth into a more urbanised location. The combinations of receptor sensitivity and impact magnitude for FY allow for the selection of moderate or large beneficial effects – moderate has been selected on the basis that the proposals for the strategic sites are not yet confirmed. This results in the following assessments of significance for the impacts of the Scheme plus embedded mitigation on determinants of health. Moderate beneficial and significant: Access OY and FY.			
		Embedded mitigation: Refer to G1, G4, WE22, PHH17, SD1, SD2, SD3 and SD5 in Table 13-56. **Essential mitigation:** Periodic review of the Scheme (at construction, opening year and post opening) against defined sustainability objectives (generated through collaborative workshop inputs during Scheme development) to ensure that intended sustainability benefits are appropriately reviewed, evidenced, and recorded; and that continual improvement actions can be pursued through the establishment and implementation of a feedback loop. Effective information share regarding the improvements to accessibility, connectivity, and journey times, in accordance with the communication plan led by the PLO (refer to mitigation ref. PHH17).			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
	Outcome and residual effects assessment (effect + essential mitigation)	The predicted health outcome is positive. **Access**: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **moderate beneficial (significant)** in OY and **moderate beneficial (significant)** in FY**.**			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
Residents of properties at Uckington, Moat Lane and Cooks Lane	Health and wellbeing outcomes from: - **Access:** Improvements to access via the A4019 through Scheme design / junction arrangements, bus infrastructure improvements and the provision of the Link Road integrated with WCH enhancements via a segregated and extended network. - **Landscape amenity:** introduction of transportation infrastructure at the landscape scale, which will have a more urban character. Softening of the transportation infrastructure into the landscape as the environmental design (landscaping and biodiversity enhancement) matures and construction work sites return to previous or agreed use. Scheme will deliver infrastructure required to catalyse development of	High	**Access:** OY: Enhancements to strategic highway network, WCH routes and public transport services, including a bus lane on the eastbound A4019, contributing to an increase in accessibility and provision for Active Travel, the latter to the benefit of physical health. Improvements in public transport accessibility (relocation of Cooks Lane bus stops closer to Uckington and a signalised crossing) and journey time reliability, plus addition of the Link Road may improve the ability of individuals to access services and facilities that support physical and mental health. Specific improvements **Moderate beneficial magnitude** (medium scale, medium term duration, affecting regular trips, moderate to major changes in quality of life, large minority of residents affected) FY: The Scheme will facilitate the growth within the strategic development sites that the Scheme delivers infrastructure for. Improvements in the accessibility and availability of community assets important for health and wellbeing for the existing and prospective residents of the study area. **Major beneficial magnitude** (high exposure in the context of the study area, long-term, daily movement patterns, changes in morbidity due to behavioural change (Active Travel opportunities), majority of population affected	Access OY: Large beneficial (significant) FY: Very large beneficial (significant) Landscape amenity: OY: Slight adverse (not significant) FY: Moderate adverse (significant)	Access OY and FY: Positive Landscape amenity: OY and FY: negative

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
	the strategic development sites, which will have a transformational urbanising impact on the landscape in the FY. As per the wider population (operational Scheme): - Air quality - Social and water pollution - Safety - Noise		and permanent change, new services provided). **Landscape** OY: recovery of the landscape from the large-scale construction site to the smaller footprint of the permanent Scheme, which will appear as a set of linear urbanising features. At OY the infrastructure may continue to appear as incongruent with the wider landscape, particularly from more open parts of the study area. **Minor adverse magnitude** (small scale (localised), short term duration (due to evolving/maturing landscaping), minor change in quality of life and mental health (for some of the population) within the wider population, small minority of population affected) FY: the transport infrastructure of the Scheme will be embedded into the landscape through the maturing landscaping proposals. This will be off-set in some parts of the study area by the realisation of growth at the strategic development sites, specifically North West Cheltenham Development Area (Elms Park) which will have a transformational urbanising effect on the landscape and encompassing Uckington. The introduction of new communities will increase activity levels in the area, also contributing to a change in character. **Moderate adverse magnitude** (medium to high exposure, medium to long		

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
			term duration, continuous frequency, moderate to major changes in quality of life and mental health (for some of the population), majority of study area population affected, permanent changes).		
	Summary of health outcome assessment and effects assessments	The Scheme design and embedded mitigation include a combination of approaches that will avoid and/or seek to control many of the factors that contribute to changes in determinants of health that will be relevant in the OY. Of particular relevance is securing the ongoing maintenance of the Scheme; and ensuring that its benefits to people are effectively communicated when it opens. Between OY and FY, the interaction of the Scheme with the strategic development sites will be influential – there are essential mitigation measures identified for CEA (see chapter 16 (Aapplication document TR010063/APP/6.13) that are intended to support the wider population through the longer term transition of the study area from strategic growth into a more urbanised location. The combination of receptor sensitivity and impact magnitude offers the choice between two categories of effects significance for the beneficial effects (as per DMRB LA104). In this instance the higher band has been selected as the OY and FY access effects as there will be improved access around the study area to existing and new community assets. The lower band has been selected as the OY and FY for landscape amenity effects as whilst their landscape proposals will help to integrate the Scheme the overall character will be substantially altered compared to prior to the Scheme. The combinations of receptor sensitivity and impact magnitude result in the following assessments of significance for the impacts of the Scheme plus embedded mitigation on determinants of health. Very large beneficial and significant: Access FY Large beneficial and significant: Access OY Slight adverse and not significant: Landscape amenity OY Moderate adverse and significant: Landscape amenity FY		
		Embedded mitigation:			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		Refer to G1, G4, B7, B9, LV8, PHH17, SD1, SD2, SD3, SD4 and SD5 in Table 13-56. **Essential mitigation:** Periodic review of the Scheme (at construction, opening year and post opening) against defined sustainability objectives (generated through collaborative workshop inputs during Scheme development) to ensure that intended sustainability benefits are appropriately reviewed, evidenced, and recorded; and that continual improvement actions can be pursued through the establishment and implementation of a feedback loop. Effective information share regarding the improvements to accessibility, connectivity, and journey times, in accordance with the communication plan led by the PLO (refer to mitigation ref. PHH17). Minimising vegetation loss. Approach includes for detailed design process to seek to further reduce habitat loss and vegetation loss and secure maintenance in accordance with target condition (refer to mitigation ref. B9).		
	Outcome and residual effects assessment (effect + essential mitigation)	The overall health outcomes for these residents comprise a combination of positive and negative, with the situation evolving between OY and FY, as follows: Positive: Access OY and FY Negative Landscape amenity: OY and FY **Access**: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **large beneficial (significant)** in OY and **very large beneficial (significant)** in FY**.** **Landscape amenity:** The essential mitigation includes feedback loops to instigate change in the Scheme related both to the periodic sustainability review and the work of the PLO in understanding and responding to issues as they emerge. There is also commitment to securing the management of the landscaping proposals to attain target conditions. This has the potential to address issues that may relate landscape amenity and human health; however, on the basis that these are currently undefined, a			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		precautionary approach to assessment means that the residual assessment for OY is **slight adverse (not significant)** and FY is **moderate adverse (significant)**.			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
Residents of properties adjacent to the B4634 (includes Hayden)	Mental health and well-being outcomes from: **Access (vehicular and WCH access) to community facilities of all types**: OY: substantial improvements to access (vehicular, including public transport) via the A4019 through Scheme design/junction arrangements and the provision of the Link Road, integrated with WCH enhancements via a segregated and extended network. May promote increased Active Travel uptake and behavioural change. FY: facilitation of strategic transport access via a range of modes to new community facilities and assets within the strategic development sites that the Scheme delivers infrastructure for.	Medium	**Access:** OY: Enhancements to strategic highway network, WCH routes and public transport services, contributing to an increase in accessibility and provision for Active Travel, the latter to the benefit of physical health. Improvements in public transport accessibility and journey time reliability, plus addition of the Link Road may improve the ability of individuals to access services and facilities that support physical and mental health. **Moderate beneficial magnitude** (medium scale, medium term duration, affecting regular trips, moderate to major changes in quality of life, large minority of residents affected). FY: Extension of the strategic highway network into and facilitating growth within the strategic development sites that the Scheme delivers infrastructure for, in particular the west Cheltenham development area. Improvements in accessibility to and availability of community assets and employment opportunities important for health and wellbeing for the existing and prospective residents of the study area. **Major beneficial magnitude** (high exposure in the context of the study area, long-term, daily movement patterns, changes in morbidity due to behavioural change (Active Travel opportunities), majority of population affected	Access OY: Moderate beneficial (significant) Access FY: Large beneficial (significant) Landscape amenity: OY: Slight adverse (not significant) Landscape amenity: FY: Moderate adverse (significant)	Access OY and FY: Positive Landscape OY and FY: Negative

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
	Landscape amenity: Relating to Link Road. Introduction of transportation infrastructure at the landscape scale, which will have a more urban character. Softening of the transportation infrastructure into the landscape as the environmental design (landscaping and biodiversity enhancement) matures and construction work sites return to previous or agreed use. Scheme will deliver infrastructure required to catalyse development of the strategic development sites, which will have a transformational urbanising impact on the landscape in the FY. As per the wider population (operational Scheme): - Air quality - Soil and water pollution - Noise		and permanent change, new services provided). **Landscape amenity:** OY: recovery of the landscape from the large-scale construction site to the smaller footprint of the permanent Scheme, which will appear as a set of linear urbanising features. At OY the infrastructure may continue to appear as incongruent with the wider landscape, particularly from more open parts of the study area. **Minor adverse magnitude** (small scale (localised), short term duration (due to evolving/maturing landscaping), minor change in quality of life and mental health (for some of the population) within the wider population, small minority of population affected) FY: the transport infrastructure of the Scheme will be embedded into the landscape through the maturing landscaping proposals. This will be off-set in some parts of the study area by the realisation of growth at the strategic development sites, specifically west Cheltenham Development Area, which will have a transformational urbanising effect on the landscape and areas to the south of Hayden and properties along the B4634. The introduction of new communities will increase activity levels in the area, also contributing to a change in character. **Moderate adverse magnitude** (medium to high exposure, medium		

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
			to long term duration, continuous frequency, moderate to major changes in quality of life and mental health (for some of the population), majority of study area population affected, permanent changes).		
	Summary of health outcome assessment and effects assessments	The Scheme design and embedded mitigation include a combination of approaches that will avoid and/or seek to control many of the factors that contribute to changes in determinants of health that will be relevant in the OY. Of particular relevance is securing the ongoing maintenance of the Scheme; and ensuring that its benefits to people are effectively communicated when it opens. Between OY and FY, the interaction of the Scheme with the strategic development sites will be influential – there are essential mitigation measures identified for CEA (see chapter 16 (Aapplication document TR010063/APP/6.13) that are intended to support the wider population through the longer term transition of the study area from strategic growth into a more urbanised location. The combinations of receptor sensitivity and impact magnitude result in the following assessments of significance for the impacts of the Scheme plus embedded mitigation on determinants of health. Large beneficial and significant: Access FY Moderate beneficial and significant: Access OY Slight adverse and not significant: Landscape OY Moderate adverse and significant: Landscape FY		
		Embedded mitigation: Refer to G1, G4, B7, B9, LV8, PHH17, SD1, SD2, SD3 and SD5 in Table 13-56. **Essential mitigation:**			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		Periodic review of the Scheme (at construction, opening year and post opening) against defined sustainability objectives (generated through collaborative workshop inputs during Scheme development) to ensure that intended sustainability benefits are appropriately reviewed, evidenced, and recorded; and that continual improvement actions can be pursued through the establishment and implementation of a feedback loop. Effective information share regarding the improvements to accessibility, connectivity, and journey times, in accordance with the communication plan led by the PLO (refer to mitigation ref. PHH17). Minimising vegetation loss. Approach includes for detailed design process to seek to further reduce habitat loss and vegetation loss and secure maintenance in accordance with target condition (refer to mitigation ref. B9).			
	Outcome and residual effects assessment (effect + essential mitigation)	Positive: Access OY and FY Negative Landscape amenity: OY and FY **Access**: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **moderate beneficial (significant)** in OY and **large beneficial (significant)** in FY**.** **Landscape amenity:** The essential mitigation includes feedback loops to instigate change in the Scheme related both to the periodic sustainability review and the work of the PLO in understanding and responding to issues as they emerge. There is also commitment to securing the management of the landscaping proposals to attain target conditions. This has the potential to address issues that may relate landscape amenity and human health; however, on the basis that these are currently undefined, as are the proposals for the strategic development sites, a precautionary approach to assessment means that the residual assessment for OY is **slight adverse (not significant)** and FY is **moderate adverse (significant)**.			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
Residents of properties at Homecroft Drive and Appleyard Close (north)	Health and wellbeing outcomes from: - **Access:** Improvements to access via the A4019 through Scheme design / junction arrangements and the provision of the Link Road integrated with WCH enhancements via a segregated and extended network. As per the wider population (operational Scheme): - Air quality - Soil and water pollution - Safety - Noise	High	**Access:** OY: Enhancements to strategic highway network, WCH routes and public transport services, contributing to an increase in accessibility and provision for Active Travel, the latter to the benefit of physical health. Improvements in public transport accessibility and journey time reliability, plus addition of the Link Road may improve the ability of individuals to access services and facilities that support physical and mental health. Specific junction improvements to access the A4019 that have been designed to benefit this receptor cluster, informed by consultation and engagement. **Moderate beneficial magnitude** (medium scale, medium term duration, affecting regular trips, moderate to major changes in quality of life, large minority of study area population affected). FY: The Scheme will facilitate the growth within the strategic development sites that the Scheme delivers infrastructure for. Improvements in the accessibility and availability of community assets important for health and wellbeing for the existing and prospective residents of the study area. **Major beneficial magnitude** (high exposure in the context of the study area, long-term,	Access: OY: Large beneficial (significant) FY: Large beneficial (significant)	Access: OY and FY Positive

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
			daily movement patterns, changes in morbidity due to behavioural change (Active Travel opportunities), majority of population affected and permanent change, new services provided).		
	Summary of health outcome assessment and effects assessments	The Scheme design and embedded mitigation include a combination of approaches that will avoid and/or seek to control many of the factors that contribute to changes in determinants of health that will be relevant in the OY. Of particular relevance is securing the ongoing maintenance of the Scheme; and ensuring that its benefits to people are effectively communicated when it opens. Between OY and FY, the interaction of the Scheme with the strategic development sites will be influential – there are essential mitigation measures identified for CEA (see chapter 16 (Aapplication document TR010063/APP/6.13) that are intended to support the wider population through the longer term transition of the study area from strategic growth into a more urbanised location. The combination of receptor sensitivity and impact magnitude offers the choice between two categories of effects significance for the beneficial effects (as per DMRB LA104). In this instance the higher band has been selected as the OY as the Scheme design includes specific junction designs to improve the safety of access between these residents and the A4019, these include the introduction of a signalised T-junction opposite Homecroft Drive and a signalised crossroad incorporating the existing access from the Civil Service Sports Ground with a new access road from Homecroft Drive and Sandpiper Drive feeing into the southern arm of the junction. The lower band has been selected as the FY effect as the development of the strategic development sites within the area has the potential to increase the accessibility of community and recreational facilities as well as recreational WCH routes supporting physical and mental health but is not yet defined. The combinations of receptor sensitivity and impact magnitude result in the following assessments of significance for the impacts of the Scheme plus embedded mitigation on determinants of health. Large beneficial and significant: Access OY and FY.		

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		Embedded mitigation: Refer to G1, G4, PHH17, SD1, SD2, SD3 and SD5 in Table 13-56. **Essential mitigation:** Periodic review of the Scheme (at construction, opening year and post opening) against defined sustainability objectives (generated through collaborative workshop inputs during Scheme development) to ensure that intended sustainability benefits are appropriately reviewed, evidenced, and recorded; and that continual improvement actions can be pursued through the establishment and implementation of a feedback loop. Effective information share regarding the improvements to accessibility, connectivity, and journey times, in accordance with the communication plan led by the PLO (refer to mitigation ref. PHH17).		
	Outcome and residual effects assessment (effect + essential mitigation)	The predicted health outcome is positive. **Access**: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **large beneficial (significant)** in OY and in FY**.**			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
Residents of properties at Withybridge Gardens and Stanboro Lane (including Sheldon Cottages) and Withybridge Lane (around the M5 Junction 10)	Physical and mental wellbeing outcomes from: **Access (vehicular and WCH access) to community facilities of all types**: OY: substantial improvements to access (vehicular, including public transport) via the A4019 through Scheme design/junction arrangements and the provision of the Link Road, integrated with WCH enhancements such as the Withybridge underpass via a segregated and extended network. May promote increased Active Travel uptake and behavioural change. FY: facilitation of strategic transport access via a range of modes to new community facilities and assets within the strategic development sites that the Scheme delivers infrastructure for. **Landscape:**	High	**Access:** OY: Enhancements to strategic highway network, WCH routes and public transport services, contributing to an increase in accessibility and provision for Active Travel, the latter to the benefit of physical health. Improvements in public transport accessibility (relocation of Cooks Lane bus stops closer to Uckington and a signalised crossing) and journey time reliability, plus addition of the Link Road may improve the ability of individuals to access services and facilities that support physical and mental health. Specific improvements **Moderate beneficial magnitude** (medium scale, medium term duration, affecting regular trips, moderate to major changes in quality of life, large minority of residents affected). FY: The Scheme will facilitate the growth within the strategic development sites that the Scheme delivers infrastructure for. Improvements in the accessibility and availability of community assets important for health and wellbeing for the existing and prospective residents of the study area. **Major beneficial magnitude** (high exposure in the context of the study area, long-term, daily movement patterns, changes in morbidity due to behavioural change (Active Travel opportunities), majority of residents affected	Access OY: Large beneficial (significant) Access FY: Very large (significant) Landscape: OY: Slight adverse (not significant) FY: Moderate adverse (significant)	Access OY and FY: Positive Landscape FY and OY: Negative

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
	OY: introduction of transportation infrastructure at the landscape scale, which will have a more urban character, specifically Link Road due to proximity, elevated position, and new impact of lighting. Softening of the transportation infrastructure into the landscape as the environmental design (landscaping and biodiversity enhancement) matures, particularly around the Flood Storage Area, and construction work sites return to previous or agreed use. FY: Scheme will deliver infrastructure required to catalyse development of the strategic development sites, which will have a transformational urbanising impact on the landscape.		and permanent change, new services provided). **Landscape** OY: recovery of the landscape from the large-scale construction site to the smaller footprint of the permanent Scheme, which will appear as a set of linear urbanising features. At OY the infrastructure may continue to appear as incongruent with the wider landscape, particularly from more open parts of the study area. The loss of properties and residents will result in a lost sense of community for remaining residents **Minor adverse magnitude** (small scale (localised), short term duration (due to evolving/maturing landscaping), minor change in quality of life and mental health (for some of the population) within the wider population, small minority of population affected) FY: the transport infrastructure of the Scheme will be embedded into the landscape through the maturing landscaping proposals. This will be off-set in some parts of the study area by the realisation of growth at the strategic development sites, specifically North West Cheltenham Development Area and safeguarded land to the north-west of Cheltenham which will have a transformational urbanising effect on the landscape and encompassing Uckington. The introduction of new communities will increase activity levels in		

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
			the area, also contributing to a change in character. **Moderate adverse magnitude** (medium to high exposure, medium to long term duration, continuous frequency, moderate to major changes in quality of life and mental health (for some of the population), majority of study area population affected, permanent changes).		
	Summary of health outcome assessment and effects assessments	The Scheme design and embedded mitigation include a combination of approaches that will avoid and/or seek to control many of the factors that contribute to changes in determinants of health that will be relevant in the OY. Of particular relevance is securing the ongoing maintenance of the Scheme; and ensuring that its benefits to people are effectively communicated when it opens. Between OY and FY, the interaction of the Scheme with the strategic development sites will be influential – there are essential mitigation measures identified for CEA (see chapter 16 (Aapplication document TR010063/APP/6.13) that are intended to support the wider population through the longer term transition of the study area from strategic growth into a more urbanised location. The combination of receptor sensitivity and impact magnitude offers the choice between two categories of effects significance for the beneficial effects (as per DMRB LA104). In this instance the higher band has been selected as the OY and FY access effects as there will be improved access around the study area to existing and new community assets. The lower band has been selected as the OY and FY for landscape amenity effects as whilst their landscape proposals will help to integrate the Scheme, the proportion of residents affected will be reduced due to the demolition of properties and relocation of residents during the construction of the Scheme.		
		Embedded mitigation: Refer to G1, G4, B7, B9, LV8, PHH17, SD1, SD2, SD3, SD4 and SD5 in Table 13-56. **Essential mitigation:** Periodic review of the Scheme (at construction, opening year and post opening) against defined sustainability objectives (generated through collaborative workshop inputs during Scheme development) to			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		ensure that intended sustainability benefits are appropriately reviewed, evidenced, and recorded; and that continual improvement actions can be pursued through the establishment and implementation of a feedback loop. Effective information share regarding the improvements to accessibility, connectivity, and journey times, in accordance with the communication plan led by the PLO (refer to mitigation ref. PHH17). Minimising vegetation loss. Approach includes for detailed design process to seek to further reduce habitat loss and vegetation loss and secure maintenance in accordance with target condition (refer to mitigation ref. B9).			
	Outcome and residual effects assessment (effect + essential mitigation)	The overall health outcomes for these residents comprise a combination of positive and negative, with the situation evolving between OY and FY, as follows: Positive: Access OY and FY Negative Landscape amenity: OY and FY **Access**: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **large beneficial (significant)** in OY and **very large beneficial (significant)** in FY**.** **Landscape amenity:** The essential mitigation includes feedback loops to instigate change in the Scheme related both to the periodic sustainability review and the work of the PLO in understanding and responding to issues as they emerge. There is also commitment to securing the management of the landscaping proposals to attain target conditions. This has the potential to address issues that may relate landscape amenity and human health; however, on the basis that these are currently undefined, a precautionary approach to assessment means that the residual assessment for OY is **slight adverse (not significant)** and **moderate adverse (significant).**			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
Residents of properties at Swindon Village	Health and wellbeing outcomes from: - **Access:** Improvements to access via the A4019 through Scheme design / junction arrangements and the provision of the Link Road integrated with WCH enhancements via a segregated and extended network. As per the wider population (operational Scheme): - Air quality - Safety - Noise	Low	**Access:** OY: Enhancements to strategic highway network, WCH routes and public transport services, contributing to an increase in accessibility and Active Travel, the latter to the benefit of physical health. Improvements in public transport accessibility and journey time reliability, plus addition of the Link Road may improve the ability of individuals to access services and facilities that support physical and mental health. **Moderate beneficial magnitude** (medium scale, medium term duration, affecting regular trips, moderate to major changes in quality of life, large minority of study area population affected). FY: The Scheme will facilitate the growth within the strategic development sites that the Scheme delivers infrastructure for. Improvements in the accessibility and availability of community assets important for health and wellbeing for the existing and prospective residents of the study area. **Major beneficial magnitude** (high exposure in the context of the study area, long-term, daily movement patterns, changes in morbidity due to behavioural change (Active Travel opportunities), majority of population affected and permanent change, new services provided).	Access: OY: Slight beneficial (significant) FY: Moderate beneficial (significant)	Access: OY and FY Positive

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
	Summary of health outcome assessment and effects assessments	The Scheme design and embedded mitigation include a combination of approaches that will avoid and/or seek to control many of the factors that contribute to changes in determinants of health that will be relevant in the OY. Of particular relevance is securing the ongoing maintenance of the Scheme and ensuring that its benefits to people are effectively communicated when it opens. Between OY and FY, the interaction of the Scheme with the strategic development sites will be influential – there are essential mitigation measures identified for CEA (see chapter 16 (~~a~~Application document TR010063/APP/6.13) that are intended to support the wider population through the longer term transition of the study area from strategic growth into a more urbanised location. The combinations of receptor sensitivity and impact magnitude offer the choice between two categories of effects significance (as per DMRB LA104). In this instance, the higher band has been selected for FY access effects as the North West Cheltenham Development Area is anticipated to offer additional playing pitches, educational facilities (primary and secondary) and community facilities which will support improved access to social opportunities. The combinations of receptor sensitivity and impact magnitude result in the following assessments of significance for the impacts of the Scheme plus embedded mitigation on determinants of health. Slight beneficial and not significant: Access OY Moderate beneficial and significant: Access FY			
		Embedded mitigation: Refer to G1, G4, WE22, PHH17, SD1, SD2, SD3 and SD5 in Table 13-56. **Essential mitigation:** Periodic review of the Scheme (at construction, opening year and post opening) against defined sustainability objectives (generated through collaborative workshop inputs during Scheme development) to ensure that intended sustainability benefits are appropriately reviewed, evidenced, and recorded; and that continual improvement actions can be pursued through the establishment and implementation of a feedback loop.			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		Effective information share regarding the improvements to accessibility, connectivity, and journey times, in accordance with the communication plan led by the PLO (refer to mitigation ref. PHH17).			
	Outcome and residual effects assessment (effect + essential mitigation)	The predicted health outcome is positive. **Access**: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **slight beneficial (not significant)** in OY and **moderate beneficial (significant)** in FY**.**			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
Users of the PRoW / WCH network within the Order limits and connecting part of the study area	Physical and mental health and wellbeing outcomes from: **Access:** OY: substantial improvements and enhancements to WCH routes via segregated and extended network of routes, which may promote increased Active Travel uptake and behavioural change. FY: facilitation of strategic transport access via a range of modes to new community facilities and assets within the strategic development sites that the Scheme delivers infrastructure for **Safety:** Reduced risk of conflict between different modes, due to modal separation within the Scheme design. Refer to wider population assessment:	High	**Access:** OY: Enhancements to strategic highway network, public transport services and WCH routes (including new bridleway and recreational routes, shared use pathways and segregated cycle ways) contributing to an increase in accessibility and provision for Active Travel, the latter to the benefit of physical health. Improvements in public transport accessibility and journey time reliability, as well as WCH route connectivity may improve the ability of individuals to access services and facilities that support physical and mental health. **Moderate beneficial magnitude** (medium scale, medium term duration, affecting regular trips, moderate to major changes in quality of life, large minority of study area population affected). FY: The Scheme will facilitate the growth within the strategic development sites that the Scheme delivers infrastructure for. Improvements in the accessibility and availability of community assets via connected WCH routes will support social wellbeing and encourage the uptake of active travel offering physical health outcomes for the existing and prospective residents of the study area. **Major beneficial magnitude** (high exposure in the context of the study area, long-term, daily movement patterns, changes in morbidity due to behavioural change (Active Travel opportunities), majority of population affected	Access OY: Large beneficial (significant) Access FY: Very large beneficial (significant) Safety OY and FY: Large beneficial (significant)	Access OY and FY: Positive Safety OY and FY: Positive

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
	- Landscape amenity - Air quality - Soil and water - Noise		and permanent change, new services provided). **Safety OY and FY**: reduced risk of injury for the WCH users and vehicles through removal of modal conflicts and enhanced segregated WCH provision and networks, and signalised crossings. **Moderate beneficial magnitude** (medium scale, medium term duration design solution to safety, minor to major changes in morbidity and quality of life affecting majority of WCH users)		
	Summary of health outcome assessment and effects assessments	The Scheme design and embedded mitigation include a combination of approaches that will avoid and/or seek to control many of the factors that contribute to changes in determinants of health that will be relevant in the OY. Of particular relevance is securing the ongoing maintenance of the Scheme and ensuring that its benefits to people are effectively communicated when it opens. Between OY and FY, the interaction of the Scheme with the strategic development sites will be influential – there are essential mitigation measures identified for CEA (see chapter 16 (~~a~~Application document TR010063/APP/6.13) that are intended to support the wider population through the longer term transition of the study area from strategic growth into a more urbanised location. The combinations of receptor sensitivity and impact magnitude offer the choice between two categories of effects significance (as per DMRB LA104). In this instance, the higher band had been selected for access effects as the Scheme's improvements to WCH routes and safety should support the uptake of active travel which benefits physical and mental health as well as social activities. The combinations of receptor sensitivity and impact magnitude result in the following assessments of significance for the impacts of the Scheme plus embedded mitigation on determinants of health. Very large beneficial and significant: Access FY Large beneficial and significant: Access OY and safety OY and FY		

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		Embedded mitigation: Refer to G1, G4, PHH17, SD1, SD2, SD3, SD4 and SD5 in Table 13-56. **Essential mitigation:** Periodic review of the Scheme (at construction, opening year and post opening) against defined sustainability objectives (generated through collaborative workshop inputs during Scheme development) to ensure that intended sustainability benefits are appropriately reviewed, evidenced, and recorded; and that continual improvement actions can be pursued through the establishment and implementation of a feedback loop. Effective information share regarding the improvements to accessibility, connectivity, and journey times, in accordance with the communication plan led by the PLO (refer to mitigation ref. PHH17).			
	Outcome and residual effects assessment (effect + essential mitigation)	The overall predicted health outcome for WCH users is positive. **Access**: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **large beneficial (significant)** in OY and **very large beneficial (significant)** in FY**.** **Safety**: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment for OY and FY and is **large beneficial (significant).**			

Community assets

Table 13-52 – Health outcomes of construction activities relating to community assets

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
West Cheltenham Fire Station	Physical and mental health and wellbeing outcomes from: - **Access:** Loss/ reduction/ temporary disruption and change to access to the receptor and its catchment area Temporary closure, modification, or diversion of local roads and WCH and access to public transport for a prolonged period Refer to wider population assessment: - Safety - Noise	High	**Access:** Loss of access to public transport, temporary closure, modifications or diversions to local roads and disruptions to WCH. This will cause disruptions to normal journeys through increases in journey complexity or journey times and the loss or amended access to residential properties arising from construction activities with adverse outcomes felt more acutely by residents in the study area requiring emergency services, resulting in health and wellbeing outcomes. **Moderate adverse magnitude** (medium scale, medium term duration, affecting regular trips, moderate to major changes in quality of life, majority of residents affected, gradual reversal)	Access: Moderate adverse (significant)	Access: negative
	Summary of health outcome assessment and effects assessments	The Scheme design and embedded mitigation include a combination of approaches that will avoid and/or seek to control many of the factors that contribute to changes in determinants of health. Of particular relevance are the controls on traffic management, sources of pollution and the expectations of the appointment and activities of the PLO, all of which are set out within the EMP; coupled with the combined environmental design, which draws together landscape and noise attenuation (together with biodiversity and flood risk management). This results in the following assessments of significance for the impacts of the Scheme plus embedded mitigation on determinants of health:			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		- Moderate adverse and significant: Access			
		Embedded mitigation: Refer to G1, G2, G3, G4, G10, PHH1, PHH2, PHH3, PHH4, PHH6, PHH9, PHH13 and SD7 in Table 13-56. **Essential mitigation:** - Contractor to develop and implement an emergency vehicle movement plan as part of traffic management along the A4019 during construction. This will need to apply to all emergency vehicles seeking to move through the Order limits under Blue Lights, and also egress from West Cheltenham Fire Station for emergency response vehicles (refer to mitigation ref. PHH1). - A clear and consistent signage strategy will be designed and implemented, to direct NMUs during construction and support access to community and recreational facilities; and bus stop provision, using footpaths and cycleways (refer to mitigation ref. PHH2).			
	Outcome and residual effects assessment (effect + essential mitigation)	The predicted health outcome is negative. Access: The essential mitigation includes feedback loops to instigate change in the Scheme related both to the periodic sustainability review and the work of the PLO in understanding and responding to issues as they emerge. In addition, there is a requirement for effective advance communication of changes to access arrangements, in consultation with affected receptors; supported by temporary signage strategies to all community facilities for all modes. Taken together, these essential mitigations are considered to reduce the magnitude of impact to minor adverse. The combination of this impact magnitude and sensitivity means that the residual effects assessment remains **moderate adverse, which is significant.**			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
Users of Cheltenham Civil Service Tennis and Football Clubs	Physical and mental health and wellbeing outcomes from: - **Access:** Loss/ reduction/ temporary disruption and change to access to the receptor and its catchment area Temporary closure, modification or diversion of local roads and WCH and access to public transport for a prolonged period - **Noise:** Introduction of additional sources of noise associated with construction worker traffic movements, construction vehicles, construction plant, machinery, and construction processes, which will include building demolition. Changes in the noise climate at the receptor which includes outdoor sporting provision. Refer to wider population assessment: - Air quality	High	**Access:** Loss of access to public transport, temporary closure, modifications or diversions to local roads and disruptions to WCH. This will cause disruptions to normal journeys through increases in journey complexity or journey times arising from construction activities. Journey changes can induce anxiety or stress and reduce participation of physical activities at this receptor. **Moderate adverse magnitude** (medium scale, medium term duration, affecting regular trips, moderate to major changes in quality of life, majority of residents affected, gradual reversal) **Noise:** Increases in noise associated with construction activities but could be associated with changes in traffic activities, including the movement of construction workers. Members could experience hearing sensitivity, cardiovascular and physiological effects, mental health and behavioural effects including reduction in concentration and productivity. The reduction in the amenity of the community asset may reduce the amount of time members spend participating in activities, particularly outdoors, affecting physical health. **Moderate adverse magnitude** (low exposure, medium term duration, daily events, low changes in morbidity for wider population, large minority of population affected and gradual reversal as Scheme is implemented)	Access: Moderate adverse (significant) Noise: Moderate adverse (significant)	Access: Negative Noise: Negative

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
	- Landscape amenity				
	Summary of health outcome assessment and effects assessments	The Scheme design and embedded mitigation include a combination of approaches that will avoid and/or seek to control many of the factors that contribute to changes in determinants of health. Of particular relevance are the controls on traffic management, sources of pollution and the expectations of the appointment and activities of the PLO, of which are set out within the EMP; coupled with the combined environmental design, which draws together landscape and noise attenuation (together with biodiversity and flood risk management). The Scheme design also incorporates a specific tie in with the vehicular access for the receptor, which is expected to be delivered as early as practicable within the construction phase. The combination of receptor sensitivity and impact magnitude offers the choice between two categories of effects significance for the adverse effects (as per DMRB LA104). In this instance the lower band has been selected for access and noise effects, reflecting the considerable scope of controls on relevant matters set out in the EMP. The combinations of receptor sensitivity and impact magnitude result in the following assessments of significance for the impacts of the Scheme plus embedded mitigation on determinants of health. Moderate adverse and significant: Access and noise			
		Embedded mitigation: Refer to G1, G2, G3, G4, G10, NV1, LV6, PHH1, PHH2, PHH3, PHH4, PHH5, PHH7, PHH9, PHH13, and PHH18 in Table 13-56. **Essential mitigation:** PC to develop and implement temporary traffic management measures provide continuity of access and egress for all community facilities during the construction stage. This includes for the Cheltenham Civil Service Tennis and Football Clubs (refer to mitigation PHH2).			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		A clear and consistent signage strategy will be designed and implemented, to direct WCH during construction and support access to community and recreational facilities; and bus stop provision, using footpaths and cycleways (refer to mitigation PHH2). Weekly bulletins and feedback loop to respond to community concerns. Ensure that PLO communications include targeted information about how communities can move around to minimise disruption; and that there is an effective mechanism for PLO to generate change in the Scheme in response to feedback once construction is underway, through the Compensation Event procedure (refer to mitigation ref. PHH4, PHH9 and PHH13). Contractor required to provide sufficient space (pavement width for example) to allow pedestrians, including wheelchair and pushchair users; and cyclists to travel safely through areas under traffic management (refer to mitigation ref. PHH18).			
	Outcome and residual effects assessment (effect + essential mitigation)	The predicted health outcome is negative. **Access:** The essential mitigation includes feedback loops to instigate change in the Scheme related both to the periodic sustainability review and the work of the PLO in understanding and responding to issues as they emerge. In addition, there is a requirement for effective advance communication of changes to access arrangements, in consultation with affected receptors; supported by temporary signage strategies to all community facilities for all modes. Taken together, these essential mitigations are considered to reduce the magnitude of impact to minor such that the residual effects assessment is **slight adverse, which is not significant.** **Noise:** The essential mitigation includes feedback loops to instigate change in the Scheme related both to the periodic sustainability review and the work of the PLO in understanding and responding to issues as they emerge. There is also a commitment to detailed design exploring changes to landscaping and barriers to achieve targeted noise abatement. This has the potential to address issues that may relate to noise and human health; however, on the basis that these are currently undefined, a precautionary			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		approach to assessment means that the residual assessment remains **moderate adverse, which is significant.**			

Table 13-53 – Health outcomes of operational Scheme relating to community assets

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
Cheltenham West Community Fire and Rescue Station Users of Cheltenham Civil Service Tennis and Football Clubs	Physical, mental health and well-being outcomes from: **Access improvements (vehicular and WCH access) to community facilities of all types**: OY: substantial improvements to access (vehicular, including public transport) via the A4019 through Scheme design/junction arrangements and the provision of the Link Road, integrated with WCH enhancements via a segregated and extended network. May promote increased Active Travel uptake and behavioural change. FY: facilitation of strategic transport access via a range of modes to new community facilities and assets within the strategic development	High	**Access:** OY: Enhancements to strategic highway network, WCH routes and public transport services, contributing to an increase in accessibility and provision for Active Travel, the latter to the benefit of physical health. Improvements in public transport accessibility and journey time reliability, plus addition of the Link Road may improve the ability of residents in the study area to access the facilities at Cheltenham Civil Service Tennis and Football Clubs and activities held at West Cheltenham Fire Station to support physical and mental health. Strategic highway network improvements will improve time reliability for emergency journeys to and from West Cheltenham Fire Station **Moderate beneficial magnitude** (medium scale, medium term duration, affecting regular trips, moderate to major changes in quality of life, large minority of study area population affected). FY: The Scheme will facilitate the growth within the strategic development sites that the Scheme delivers infrastructure for. The strategic sites will introduce new communities, a wider catchment for the West Cheltenham Fire Station and potentially increasing membership numbers at the Cheltenham Civil Service Tennis and Football Clubs.	Access OY: Large beneficial Access FY: Large beneficial	Access: Positive

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
	sites that the Scheme delivers infrastructure for. Refer to wider population assessment: - Air quality - Soil and water pollution - Safety - Noise - Landscape amenity		Improvements in the accessibility and availability of community assets important for health and wellbeing for the existing and prospective residents of the study area. **Major beneficial magnitude** (high exposure in the context of the study area, long-term, daily movement patterns, changes in morbidity due to behavioural change (Active Travel opportunities), majority of population affected and permanent change, new services provided).		
	Summary of health outcome assessment and effects assessments	The Scheme design and embedded mitigation include a combination of approaches that will avoid and/or seek to control many of the factors that contribute to changes in determinants of health that will be relevant in the OY. Of particular relevance is securing the ongoing maintenance of the Scheme, and ensuring that its benefits to people are effectively communicated when it opens. Between OY and FY, the interaction of the Scheme with the strategic development sites will be influential – there are essential mitigation measures identified for CEA (see chapter 16 (Aapplication document TR010063/ APP/6.13) that are intended to support the wider population through the longer term transition of the study area from strategic growth into a more urbanised location. The combination of receptor sensitivity and impact magnitude offers the choice between two categories of effects significance for the beneficial effects (as per DMRB LA104). In this instance the higher band has been selected for the OY as there will be improved access to and from the receptors which will increase opportunities for social participation and for emergency services to reach those in need. The lower band has been selected for the FY as the introduction of new residents to the area will increase the number of residents reliant on the West Cheltenham Fire Station services. The introduction of new residents may result increase usage of the Cheltenham Civil Service Tennis and Football Clubs, reducing the capacity of sport slots for members using the facility prior to the Scheme.			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		The combinations of receptor sensitivity and impact magnitude result in the following assessments of significance for the impacts of the Scheme plus embedded mitigation on determinants of health. Large beneficial and significant: Access OY and FY			
		Embedded mitigation: Refer to PHH17, SD1, SD2, SD3 and SD5 in Table 13-56. **Essential mitigation:** Periodic review of the Scheme (at construction, opening year and post opening) against defined sustainability objectives (generated through collaborative workshop inputs during Scheme development) to ensure that intended sustainability benefits are appropriately reviewed, evidenced, and recorded; and that continual improvement actions can be pursued through the establishment and implementation of a feedback loop. Effective information share regarding the improvements to accessibility, connectivity, and journey times, in accordance with the communication plan led by the PLO (refer to mitigation ref. PHH17).			
	Outcome and residual effects assessment (effect + essential mitigation)	The predicted health outcome is positive. **Access**: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **large beneficial (significant)** in OY and in FY**.**			

Employment and training assets

Table 13-54 – Health outcomes of construction activities relating to employment and training assets

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
Greensteps National Star – employees and students	Physical and mental health and wellbeing outcomes from: - **Access:** Temporary closure, modification, or diversion of local roads and WCH and access to public transport for a prolonged period Refer to wider population assessment: - Air quality - Soil and water pollution - Safety - Noise - Landscape amenity	High	**Access:** Loss of access to public transport, temporary closure, modifications or diversions to local roads and disruptions to WCH. This will cause disruptions to normal journeys through increases in journey complexity or journey times arising from construction activities. Journey changes can induce anxiety or stress, particularly for vulnerable groups who can struggle to adapt to change and could result in reduced participation of physical activities (education and training opportunities) at this receptor. **Moderate adverse magnitude** (medium scale, medium term duration, affecting regular trips, moderate to major changes in quality of life, majority of residents affected, gradual reversal)	Access: moderate adverse (significant)	Negative
	Summary of health outcome assessment and effects assessments	The Scheme design and embedded mitigation include a combination of approaches that will avoid and/or seek to control many of the factors that contribute to changes in determinants of health. Of particular relevance are the controls on traffic management, sources of pollution and the expectations of the appointment and activities of the PLO, of which are set out within the EMP; coupled with the combined environmental design, which draws together landscape and noise attenuation (together with biodiversity and flood risk management). The combination of receptor sensitivity and impact magnitude offers the choice between two categories of effects significance for the adverse effects (as per DMRB LA104). In this instance the lower band has been			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		selected for access, reflecting the considerable scope of controls on relevant matters set out in the EMP and the availability of an alternative access route to the receptor from the east. Moderate adverse and significant: Access			
		Embedded mitigation: Refer to G1, G2, G3, G4, G10, PHH2, PHH3, PHH4, PHH6, PHH9, PHH15, PHH18 in Table 13-56. **Essential mitigation:** PC to develop and implement temporary traffic management measures provide continuity of access and egress for all community facilities during the construction stage (refer to mitigation PHH2). A clear and consistent signage strategy will be designed and implemented, to direct WCH during construction and support access to community and recreational facilities; and bus stop provision, using footpaths and cycleways (refer to mitigation PHH2). Weekly bulletins and feedback loop to respond to community concerns. Ensure that PLO communications include targeted information about how communities can move around to minimise disruption; and that there is an effective mechanism for PLO to generate change in the Scheme in response to feedback once construction is underway, through the Compensation Event procedure (refer to mitigation ref. PHH4, PHH9 and PHH13). Contractor required to provide sufficient space (pavement width for example) to allow pedestrians, including wheelchair and pushchair users; and cyclists to travel safely through areas under traffic management (refer to mitigation ref. PHH18).		
	Outcome and residual effects assessment (effect + essential mitigation)	The predicted health outcome is negative. **Access:** The essential mitigation includes feedback loops to instigate change in the Scheme related both to the periodic sustainability review and the work of the PLO in understanding and responding to issues as they emerge. In addition, there is a			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		requirement for effective advance communication of changes to access arrangements, in consultation with affected receptors; supported by temporary signage strategies to all community facilities for all modes. Taken together, these essential mitigations are considered to reduce the magnitude of impact to minor adverse. The sensitivity of the receptor is such that the residual effects assessment remains **moderate adverse, which is significant.**			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
Employees at Gallagher Retail Park and Kingsditch Trading Estate	Physical, mental health and well-being outcomes from: - **Access:** Temporary closure, modification, or diversion of local roads and WCH and access to public transport for a prolonged period. Refer to wider population assessment: - Air quality - Soil and water pollution - Safety - Noise - Landscape amenity	Medium	**Access:** Loss of access to public transport, temporary closure, modifications or diversions to local roads and disruptions to WCH. This will cause disruptions to normal journeys through increases in journey complexity or journey times arising from construction activities. Employees will have to face journey disruptions throughout their working week which may induce anxiety or stress affecting mental health and wellbeing. Access disruptions in the area may result in customers travelling to other retail parks, leading to a reduction in economic activity. Employers may also experience anxiety or stress to maintain sales during the construction works. **Moderate adverse magnitude** (medium scale, medium term duration, affecting regular trips, moderate to major changes in quality of life, majority of employees affected, gradual reversal)	Access: Moderate adverse (significant)	Negative
	Summary of health outcome assessment and effects assessments	The Scheme design and embedded mitigation include a combination of approaches that will avoid and/or seek to control many of the factors that contribute to changes in determinants of health. Of particular relevance are the controls on traffic management, sources of pollution and the expectations of the appointment and activities of the PLO, of which are set out within the EMP; coupled with the combined environmental design, which draws together landscape and noise attenuation (together with biodiversity and flood risk management). The combination of receptor sensitivity and impact magnitude offers the choice between two categories of effects significance for the adverse effects (as per DMRB LA104). In this instance the lower band has			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		been selected for access, reflecting the considerable scope of controls on relevant matters set out in the EMP. Moderate adverse and significant			
		Embedded mitigation: Refer to G1, G2, G3, G4, G10, PHH3, PHH4, PHH5, PHH6, PHH9, PHH12 and PHH18 Table 13-56. **Essential mitigation:** Weekly bulletins and feedback loop to respond to community concerns. Ensure that PLO communications include targeted information about how communities can move around to minimise disruption; and that there is an effective mechanism for PLO to generate change in the Scheme in response to feedback once construction is underway, through the Compensation Event procedure (refer to mitigation ref. PHH4, PHH9 and PHH13). PLO to prioritise direct liaison with owners/lessees of business premises anticipated to experience direct impacts on access during the construction phase, to ensure that suitable access and egress to their property is available at all times during the construction phase, for all relevant business activities (i.e. staff and patron access, deliveries and servicing) (refer to mitigation ref. PHH12). Contractor required to provide sufficient space (pavement width for example) to allow pedestrians, including wheelchair and pushchair users; and cyclists to travel safely through areas under traffic management (refer to mitigation ref. PHH18).		
	Outcome and residual effects assessment (effect + essential mitigation)	The predicted health outcome is negative. **Access:** The essential mitigation includes feedback loops to instigate change in the Scheme related both to the periodic sustainability review and the work of the PLO in understanding and responding to issues as they emerge. In addition, there is a requirement for effective advance communication of changes to access arrangements for all modes, which will assist people in preparing and adapting to changes. These essential mitigations are considered to have the potential reduce the magnitude of			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		impact; however, given the number of people affected and the scale of interaction with the daily lives of employees, the residual effects assessment remains **moderate adverse, which is significant.**			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
Employers and employees to businesses adjacent to the A4019 (including The Gloucester Old Spot public house, Stanboro Fish Farm, Cooks Lane businesses).	Physical, mental health and well-being outcomes from: - Access: Temporary closure, modification, or diversion of local roads and WCH and access to public transport for a prolonged period - Landscape amenity: Loss of amenity of surroundings due to transition of the land in the Order limits to a large-scale construction site Refer to wider population assessment: - Air quality - Soil and water pollution - Safety - Noise	High	**Access:** Loss of access to public transport, temporary closure, modifications or diversions to local roads and disruptions to WCH. This will cause disruptions to normal journeys through increases in journey complexity or time, arising from construction activities. Employees will have to face journey disruptions throughout their working week which may induce anxiety or stress affecting mental health and wellbeing. Access disruptions along the A4019 may result in customers to travel to alternative businesses, leading to a reduction in economic activity. Employers may also experience anxiety or stress to maintain sales during the construction works. **Moderate adverse magnitude** (medium scale, medium term duration, affecting regular trips, moderate to major changes in quality of life, majority of businesses affected, gradual reversal) **Landscape amenity:** Changed landscape amenity and character from an established transport network in a semi-rural context to an area of major construction and focus for change enduring for around 24 months. Businesses such as the Old Gloucester Spot public house and Stanboro Fish Farm may rely on the landscape amenity and character to support business, further increasing the anxiety or stress of employers and employees. **Major adverse magnitude** (high exposure, long-term duration, continuous frequency, permanent and	Access: Large adverse (significant) Landscape amenity: Large adverse (significant)	Access: Negative Landscape amenity: Negative

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
			evolving changes, major changes to quality of life).		
	Summary of health outcome assessment and effects assessments	The Scheme design and embedded mitigation include a combination of approaches that will avoid and/or seek to control many of the factors that contribute to changes in determinants of health. Of particular relevance are the controls on traffic management, sources of pollution and the expectations of the appointment and activities of the PLO, of which are set out within the EMP; coupled with the combined environmental design, which draws together landscape and noise attenuation (together with biodiversity and flood risk management). The temporary changes and loss of access has been assessed as a moderate adverse impact. When combined with the high sensitivity DMRB LA104 allows for the selection of moderate or large adverse effects. In this instance, large adverse effects have been concluded, balancing the considerable scope of controls on relevant matters set out in the EMP with the unavoidable presence of the construction works within the day to day activities of the businesses within the cluster – employers, employees and customers. The changes in landscape amenity have been assessed as a major adverse impact. When combined with the high sensitivity DMRB LA104 allows for the selection of large or very large adverse effects. The lower band has been selected for landscape amenity as the semi - rural landscape character will evolve into a large-scale construction site which cannot be visually screened; however, for some of the businesses this is less likely to affect day to day activities. Employers and employees will have long term and high exposure to the construction works. This results in the following assessments of significance for the impacts of the Scheme plus embedded mitigation on determinants of health: Large adverse and significant: Access and Landscape amenity.		

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		Embedded mitigation: Refer to G1, G2, G3, G4, G10, B6, B9, LV2, PHH3, PHH4, PHH5, PHH6, PHH9, PHH12 and PHH18 Table 13-56. **Essential mitigation:** Weekly bulletins and feedback loop to respond to community concerns. Ensure that PLO communications include targeted information about how communities can move around to minimise disruption; and that there is an effective mechanism for PLO to generate change in the Scheme in response to feedback once construction is underway, through the Compensation Event procedure (refer to mitigation ref. PHH4, PHH9 and PHH13). PLO to prioritise direct liaison with owners/lessees of business premises anticipated to experience direct impacts on access during the construction phase, to ensure that suitable access and egress to their property is available at all times during the construction phase, for all relevant business activities (i.e. staff and patron access, deliveries and servicing) (refer to mitigation ref. PHH12). Contractor required to provide sufficient space (pavement width for example) to allow pedestrians, including wheelchair and pushchair users; and cyclists to travel safely through areas under traffic management (refer to mitigation ref. PHH18). Minimising vegetation loss. Approach includes for detailed design process to seek to further reduce habitat loss and vegetation loss (refer to mitigation ref. B6 and LV2).		
	Outcome and residual effects assessment (effect + essential mitigation)	The predicted health outcome is negative. **Access:** The essential mitigation includes feedback loops to instigate change in the Scheme related both to the periodic sustainability review and the work of the PLO in understanding and responding to issues as they emerge. In addition, there is a requirement for effective advance communication of changes to access arrangements, in consultation with affected receptors; supported by temporary signage strategies to all community facilities for all modes. Taken together, these essential mitigations are			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		considered to reduce the magnitude of impact resulting in a residual effects assessment of **moderate adverse, which is significant.** **Landscape amenity:** The essential mitigation includes feedback loops to instigate change in the Scheme related both to the periodic sustainability review and the work of the PLO in understanding and responding to issues as they emerge. There is also commitment to exploring additional vegetation retention as part of the detailed design process and working directly with affected communities to refine proposals. This has the potential to address issues that may relate landscape amenity and human health; however, on the basis that these are currently undefined, a precautionary approach to assessment means that the residual assessment remains **large adverse, which is significant.**		

Table 13-55 – Health outcomes of operational Scheme relating to employment and training assets

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
Greensteps National Star – employees and students	**Access improvements (vehicular and WCH access)** OY: substantial improvements to access (vehicular, including public transport) via the A4019 through Scheme design/junction arrangements and the provision of the Link Road, integrated with WCH enhancements via a segregated and extended network. May promote increased Active Travel uptake and behavioural change. FY: facilitation of strategic transport access via a range of modes to new community facilities and assets within the strategic development sites that the Scheme delivers infrastructure for. Refer to the wider population assessment:	High	**Access improvements (vehicular and WCH access)** OY: Enhancements to strategic highway network, WCH routes and public transport services, contributing to an increase in accessibility and provision for Active Travel, the latter to the benefit of physical health for both employees and students, depending on individual mobility levels. Improvements in public transport accessibility and journey time reliability, plus addition of the Link Road may improve the ability of students to access the services and activities at this enterprise and educational facility, supporting their physical and mental health. **Moderate beneficial magnitude** (medium scale, medium term duration, affecting regular trips, moderate to major changes in quality of life, large minority of employees and users affected). FY: Extension of the strategic highway network into and facilitating growth within the strategic development sites that the Scheme delivers infrastructure for. Improvements in accessibility to the facility for existing and prospective students in the study area may generate increased demand for the specialist services and activities at this facility, which caters for disabled students at National Star College. The introduction of	Access OY: Large beneficial (significant) Access FY: Large beneficial (significant)	Access OY and FY: Positive

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
	- Safety - Noise - Air quality		new community facilities and assets within the strategic development sites will increase social opportunities for students providing health and wellbeing benefits. **Major beneficial magnitude** (high exposure in the context of the study area, long-term, daily movement patterns, changes in morbidity due to behavioural change (Active Travel opportunities), majority of population affected and permanent change, new services provided).		
	Summary of health outcome assessment and effects assessments	The Scheme design and embedded mitigation include a combination of approaches that will avoid and/or seek to control many of the factors that contribute to changes in determinants of health that will be relevant in the OY. Of particular relevance is securing the ongoing maintenance of the Scheme and ensuring that its benefits to people are effectively communicated when it opens. Between OY and FY, the interaction of the Scheme with the strategic development sites will be influential – there are essential mitigation measures identified for CEA (see chapter 16 (~~a~~Application document TR010063/APP/6.13) that are intended to support the wider population through the longer term transition of the study area from strategic growth into a more urbanised location. The combinations of receptor sensitivity and impact magnitude offer the choice between two categories of effects significance (as per DMRB LA 104). In this instance, the higher band has been selected for OY access effects as the improvements to access by public transport and active travel in particular, which students / young adults are often reliant upon, will enable increased participation in activities which will support future employment resulting in wellbeing benefits. The lower band has been selected for the FY as the demand for the facility may increase with new residents in the area which may reduce participation in the specialist services at this facility for existing students. However, there will be an increase in other community assets students could potentially attend.		

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		The combinations of receptor sensitivity and impact magnitude result in the following assessments of significance for the impacts of the Scheme plus embedded mitigation on determinants of health. Large beneficial and significant: Access OY and FY			
		Embedded mitigation: Refer to G1, G4, PHH17, SD1, SD2, SD3 and SD5 in Table 13-56 **Essential mitigation:** Periodic review of the Scheme (at construction, opening year and post opening) against defined sustainability objectives (generated through collaborative workshop inputs during Scheme development) to ensure that intended sustainability benefits are appropriately reviewed, evidenced, and recorded; and that continual improvement actions can be pursued through the establishment and implementation of a feedback loop. Effective information share regarding the improvements to accessibility, connectivity, and journey times, in accordance with the communication plan led by the PLO (refer to mitigation ref. PHH17).			
	Outcome and residual effects assessment (effect + essential mitigation)	The predicted health outcome is positive. **Access**: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **large beneficial (significant)** in OY and in FY**.**			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
Employees at Gallagher Retail Park and Kingsditch Trading Estate	**Access improvements (vehicular and WCH access)** OY: substantial improvements to access (vehicular, including public transport) via the A4019 through Scheme design/junction arrangements and the provision of the Link Road, integrated with WCH enhancements via a segregated and extended network. May promote increased Active Travel uptake and behavioural change. FY: facilitation of strategic transport access via a range of modes to new community facilities and assets as well as employment opportunities within the strategic development sites that the Scheme delivers infrastructure for. Refer to the wider population assessment:	Medium	**Access improvements (vehicular and WCH access)** OY: Enhancements to strategic highway network, WCH routes and public transport services, contributing to an increase in accessibility and provision for Active Travel, the latter to the benefit of physical health for both employees and customers. Improvements in public transport accessibility and journey time reliability, plus addition of the Link Road may improve the commute (improved journey time and choice of mode) of employees to and from Gallagher Retail Park and Kingsditch Trading Estate, supporting physical and mental health of employees. **Moderate beneficial magnitude** (medium scale, medium term duration, affecting regular trips, moderate to major changes in quality of life, large minority of employees and users affected). FY: Extension of the strategic highway network into and facilitating growth within the strategic development sites that the Scheme delivers infrastructure for. Improvements in the accessibility and availability of community assets may provide new opportunities for employees at Gallagher Retail Park and Kingsditch Trading Estate to participate in social activities around the working day or to find alternative employment opportunities, supporting the health and wellbeing for the existing and prospective residents of the study	Access OY: Moderate beneficial (significant) Access FY: Large beneficial (significant)	Access OY and FY: Positive

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
	- Safety		area. The increase in residents and in turn potential customers in the study area may improve economic activity at Gallagher Retail Park and Kingsditch Trading Estate helping to maintain job security for employees which reduces stress and anxiety. **Major beneficial magnitude** (high exposure in the context of the study area, long-term, daily movement patterns, changes in morbidity due to behavioural change (Active Travel opportunities), majority of population affected and permanent change, new services provided).		
	Summary of health outcome assessment and effects assessments	The Scheme design and embedded mitigation include a combination of approaches that will avoid and/or seek to control many of the factors that contribute to changes in determinants of health that will be relevant in the OY. Of particular relevance is securing the ongoing maintenance of the Scheme and ensuring that its benefits to people are effectively communicated when it opens. Between OY and FY, the interaction of the Scheme with the strategic development sites will be influential – there are essential mitigation measures identified for CEA (see chapter 16 (Aa~~a~~pplication document TR010063/APP/6.13) that are intended to support the wider population through the longer term transition of the study area from strategic growth into a more urbanised location. The combinations of receptor sensitivity and impact magnitude offer the choice between two categories of effects significance (as per DMRB LA 104). In this instance, the higher band had been selected for FY access effects as the strategic development sites may offer additional opportunities for social participation around working hours and alternative employment opportunities. The increase in residents may also increase customers at Gallagher Retail Park and Kingsditch Trading Estate supporting the job security of employees.			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		The combinations of receptor sensitivity and impact magnitude result in the following assessments of significance for the impacts of the Scheme plus embedded mitigation on determinants of health. Moderate beneficial and significant: Access OY Large beneficial and significant: Access FY			
		Embedded mitigation: G1, G4, PHH17, SD1, SD2, SD3 and SD5 in Table 13-56 **Essential mitigation:** Periodic review of the Scheme (at construction, opening year and post opening) against defined sustainability objectives (generated through collaborative workshop inputs during Scheme development) to ensure that intended sustainability benefits are appropriately reviewed, evidenced, and recorded; and that continual improvement actions can be pursued through the establishment and implementation of a feedback loop. Effective information share regarding the improvements to accessibility, connectivity, and journey times, in accordance with the communication plan led by the PLO (refer to mitigation ref. PHH17).			
	Outcome and residual effects assessment (effect + essential mitigation)	The predicted health outcome is positive. **Access**: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **moderate beneficial (significant)** in OY and **large beneficial (significant)** in FY**.**			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
Employers and employees to businesses adjacent to the A4019 (including The Gloucester Old Spot public house, Stanboro Fish Farm, Cooks Lane businesses).	**Access improvements (vehicular and WCH access)** OY: substantial improvements to access (vehicular, including public transport) via the A4019 through Scheme design/junction arrangements and the provision of the Link Road, integrated with WCH enhancements via a segregated and extended network. May promote increased Active Travel uptake and behavioural change. FY: facilitation of strategic transport access via a range of modes to new community facilities and assets within the strategic development sites that the Scheme delivers infrastructure for. Refer to the wider population assessment: - Safety - Noise	High	**Access improvements (vehicular and WCH access)** OY: Enhancements to strategic highway network, WCH routes and public transport services, contributing to an increase in accessibility and provision for Active Travel, the latter to the benefit of physical health for both employees and students. Improvements in public transport accessibility and journey time reliability, plus addition of the Link Road may improve the commute (improved journey time and choice of mode) of employees and employers to and from businesses adjacent to the A4019, supporting physical and mental health of employees. Improvements to access via the A4019 increase potential customers passing through the area, in turn supporting businesses and improving job security. **Moderate beneficial magnitude** (medium scale, medium term duration, affecting regular trips, moderate to major changes in quality of life, large minority of employees and users affected). FY: Extension of the strategic highway network into and facilitating growth within the strategic development sites that the Scheme delivers infrastructure for. Improvements in the accessibility and availability of community assets may provide new opportunities for employers and employees to participate in social activities around the working day	Access OY: Large beneficial (significant) Access: FY: Very large beneficial (significant)	Access OY and FY: Positive

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
	- Air quality - Landscape amenity		supporting the health and wellbeing for the existing and prospective residents of the study area. The increase in residents and in turn potential customers in the study area as a result of the strategic development sites, may improve economic activity of businesses helping to maintain job security for employees which reduces stress and anxiety. However, there could be increased business competition in the area. **Major beneficial magnitude** (high exposure in the context of the study area, long-term, daily movement patterns, changes in morbidity due to behavioural change (Active Travel opportunities), majority of population affected and permanent change, new services provided).		
	Summary of health outcome assessment and effects assessments	The Scheme design and embedded mitigation include a combination of approaches that will avoid and/or seek to control many of the factors that contribute to changes in determinants of health that will be relevant in the OY. Of particular relevance is securing the ongoing maintenance of the Scheme and ensuring that its benefits to people are effectively communicated when it opens. Between OY and FY, the interaction of the Scheme with the strategic development sites will be influential – there are essential mitigation measures identified for CEA (see chapter 16 (Aapplication document TR010063/ APP/6.13) that are intended to support the wider population through the longer term transition of the study area from strategic growth into a more urbanised location. The combinations of receptor sensitivity and impact magnitude offer the choice between two categories of effects significance (as per DMRB LA 104). In this instance, the higher band has been selected for both OY and FY effects as the improvements to access should help to support the economic growth of the companies.			

Receptors	Impacts	Sensitivity of Receptor	Change to health determinant and impact magnitude	Effect (Scheme + embedded mitigation)	Health outcome category
		Large beneficial and significant: Access OY Very large beneficial and significant: Access FY			
		Embedded mitigation: G1, G4, PHH17, SD1, SD2, SD3 and SD5 in Table 13-56 **Essential mitigation:** Periodic review of the Scheme (at construction, opening year and post opening) against defined sustainability objectives (generated through collaborative workshop inputs during Scheme development) to ensure that intended sustainability benefits are appropriately reviewed, evidenced, and recorded; and that continual improvement actions can be pursued through the establishment and implementation of a feedback loop. Effective information share regarding the improvements to accessibility, connectivity, and journey times, in accordance with the communication plan led by the PLO (refer to mitigation ref. PHH17).			
	Outcome and residual effects assessment (effect + essential mitigation)	The predicted health outcome is positive. **Access**: no additional essential mitigation measures are proposed. The residual effects assessment remains unchanged from the main assessment and is **large beneficial (significant)** in OY and **very large beneficial (significant)** in FY**.**			

13.14. Mitigation measures – Human Health

13.14.1. The assessment summary tables and supporting narrative provided in the previous sub-section includes the Scheme design, embedded and essential mitigation measures that are considered relevant to each set of impacts. These represent means of avoiding adverse effects through good design, delivering mitigation of adverse effects, and incorporating enhancement measures into the Scheme design, and the management of construction of the Scheme.

13.14.2. The full list of mitigation is provided in the REAC (Aapplication document TR0100063 APP 7.4). Table 13-56 provides the list of relevant embedded and essential mitigation measures, extracted from the REAC (Application document TR0100063/APP 7.4). This is then followed by summaries of the aspects of the Scheme design that have been particularly influential in conducting the human health assessment – these are prefixed 'Scheme design (SD)' and further information about them is contained within Chapter 2 (Application document TR010063/APP/6.2), which cross-referenced to the Works Numbers that are contained within the Works Plans for the Scheme (Application reference TR010063/APP/2.4).

Table 13-56 – Embedded and essential mitigation measures: an extract from the REAC; and Scheme design relevant to the human health assessment

Ref	Objective of the commitment	Description of the mitigation measure or commitment
G1	Production of an Environmental Management Plan (EMP)	*PARTIAL EXTRACT:* Preparation of an EMP. The PC to prepare an EMP for their works prior to the commencement of the DCO and which details the measures that shall be undertaken prior to, and during construction of, the Scheme. The construction of the authorised development must be carried out in accordance with the approved EMP. No part of the authorised development is to commence until an EMP (2nd iteration), substantially in accordance with the EMP (1st iteration), for that part has been submitted to and approved in writing by the Secretary of State, following consultation with the relevant planning authority to the extent that it relates to matters relevant to its functions. The EMP (2nd iteration) must be written in accordance with ISO14001 and so far, as is relevant to that part of the authorised development, must reflect the mitigation measures set out in this REAC. An EMP (3rd iteration) must be developed and completed by the end of the construction, commissioning, and handover stage of the authorised development, in accordance with the process set out in the approved EMP. The authorised development must be operated and maintained in accordance with the EMP (3rd iteration).
G2	An effective EMP	Environmental management system. The PC shall have an Environmental Management System (EMS) certified to BS EN ISO 14001. The PC's EMS will define appropriate control measures and monitoring systems to be employed during the planning and construction of the works for all relevant topic areas. The PC's EMS shall cover the activities of all their sub-contractors. The PC will also be required to coordinate with other contractors and relevant parties that may affect

Ref	Objective of the commitment	Description of the mitigation measure or commitment
		their works. This will be documented in their EMS, as appropriate. As part of their EMS, the PC shall commit to planning works in advance to ensure that, in so far as is reasonably practicable, measures to reduce environmental effects are integrated into the construction methods.
G3	An effective EMP	Environmental policy. The PC shall develop a Scheme specific environmental policy, prior to the EMS, and to be included as part of the EMS. This policy will be developed in line with environmental policies of GCC and the Scheme objectives and will set out how the PC will: • Adhere to the requirements of environmental legislation during the works. • Commit to mitigating the impacts associated with the works. • Commit to good practice in environmental performance throughout the phase of works. • Identify opportunities to improve the Scheme's whole life performance in terms of environmental and social implications.
G4	Management Plans	Management plans. The PC shall prepare Management Plans for certain environmental topic areas as the detailed design is developed, to include as a minimum the plans listed in Annex B of the EMP (1st iteration) (Aapplication document TR010063/APP/7.3). These plans will be appended to the EMP as appropriate. The plans shall be prepared in consultation with the relevant regulatory organisation, relevant planning authority and national Highways and submitted to and approved in writing by the Project to GCC.
G10	Effective Traffic Management	Traffic management will be implemented by the PC to maintain traffic flows during the construction of Junction 10, the Link Road and the widened A4019. This will include local service roads linked to the signalised junctions to enable local residents to retain an ease of access onto the A4019, particularly for turning right (onto the A4019). A minimum of one eastbound (E/B) and one westbound (W/B) traffic lane will typically be maintained on the A4019 throughout the construction period. Exceptions may be required for essential overnight lane closures where single lane working under traffic control may need to be deployed; and in instances where stakeholder engagement through the Public Liaison Officer (see PHH9) proposes alternative traffic management arrangements that are assessed as having Scheme benefits during construction and approved in writing by GCC as an acceptable alteration to the Traffic Management Plan. The movements of construction traffic (including the journeys for construction staff to and from the Scheme) will also be managed through this Traffic Management Plan to avoid adverse environmental impacts on the local road network. Construction vehicles will be managed by:

Ref	Objective of the commitment	Description of the mitigation measure or commitment
		• Preferred routes to access each area of the site and from each major source of materials. • Preferred routes during road diversions. • Management measures for construction worker traffic. The Traffic Management Plan will include temporary diversion routes for all vehicles when sections of the existing highway network must be closed. These diversions will prioritise routing via A-roads. Signage will be implemented to discourage the use of the local road network by HDVs (Heavy Duty Vehicles), except where access is required.
G11	Working hours	Unless otherwise notified (and agreed in writing with the LPA), construction works will take place during normal work hours 07:00 - 19:00 weekdays and Saturdays. Construction works outside of these hours shall be minimised as far as possible. Where possible, advance notice of construction works outside of these hours will be given through the Community Engagement process.
G12	Protection and maintenance of the Sheldon Cottages and gardens during the construction stage	The residents of the two properties at Sheldon Cottages (located on Stanboro Lane) will relocate to other accommodation during the construction phase. The cottages will be re-occupied on completion of construction by the existing residents (pre-construction), or new residents. Whilst Sheldon Cottages and gardens are within the Order limits the cottages and gardens will be protected and maintained during the construction period so that they can be re-occupied on completion of construction.
AQ1	Control dust during construction	*PARTIAL EXTRACT* Scheme specific mitigation measures to control dust during construction would be specified within contract documentation and incorporated into the EMP (2nd iteration) prior to commencement of the Scheme. Prior to commencement of the Scheme, Best Practice guidance will be followed to determine appropriate limits for the implementation of dust control measures. These measures will be captured in the Nuisance Management Plan annexed to the EMP (Second iteration). The EMP (Second iteration) will be subject to consultation with the relevant planning authorities and local highway authorities to the extent that it relates to matters relevant to its functions.
NV1	Manage noise and vibration at construction stage	Apply mitigation measures in alignment with the guidance detailed in BS 5228: 2009+A1:2014 - Part 1: Noise 'Code of Practice for noise and vibration control on construction and open sites', Part 1: Noise and Part 2: Vibration. (See paragraph 12.8.1) and best practicable means (BPM) in accordance with the Control of Pollution Act 1974. Details will be presented in the Noise and Vibration Management Plan. Local residents to be given advance notice of any activities likely to generate high levels of noise or vibration.

Ref	Objective of the commitment	Description of the mitigation measure or commitment
		Managed through the Community Engagement Plan as implemented by the PLO.
B6	Minimise loss of vegetation and avoid damage to existing vegetation (see also LV1 and LV2 below) to retain existing biodiversity resource as far as possible	Removal of minimal extent of vegetation necessary for the works. In particular, within areas of land temporarily required for topsoil storage or compounds, boundary features such as hedgerows will be retained. The design has ensured retention of three key areas, as follows: • An area of lowland meadow priority habitat immediately north of Stanboro Lane will be retained. • Embankments on the M5 at the point where the River Chelt passes under the motorway have been designed so that the existing culvert does not require extending on either side of the motorway. Consequently, there will be no direct loss of river habitat or alterations to channel bed and banks in this location. • River Chelt bridge will be a clear span structure with set-back abutments (approximately 4 m from the watercourse margin), thereby avoiding direct impacts to the in-channel and bank top habitats, ensuring fauna can continue to move along the watercourse unimpeded. Any retained vegetation will be clearly demarcated with no allowance of vehicles or storage of materials within these areas. The root zones and canopies of trees and areas of woodland to be retained will be protected during construction. Protection of retained vegetation (trees and hedges) in accordance with the Arboricultural Impact Assessment (AIA) to avoid detrimental damage. Detailed design to review opportunities for further reducing habitat loss.
B7	Habitat creation and management (terrestrial) to compensate for unavoidable habitat loss and provide enhancements	An area of farmland to the southeast of Junction 10 will be transformed into an area supporting wetland habitats, scrub, woodland, and species-rich grassland, whilst also fulfilling its role as the flood storage area. The embankments along the Link Road will be planted with blocks of woodland and hedgerows with trees. The A4019 planting comprises hedgerows and trees to the north and south, as well as trees within the central reserve and areas of species rich grassland. The focus of the planting around the junction itself and along the motorway is blocks of woodland and linear belts of trees and shrubs, along with areas of species rich grassland. Attenuation basins and ditches will be sown with wet grassland and marginal planting. Where in National Highway (NH) jurisdiction, planting is to be in accordance with NH requirements (NB. liaison with NH to be undertaken during detailed design to agree plant species in NH jurisdiction). Where in GCC jurisdiction, planting will be in accordance with GCC Highways and Biodiversity Guidance for Gloucestershire May 2022 – to be undertaken at detailed design.

Ref	Objective of the commitment	Description of the mitigation measure or commitment
		Species rich grass areas will have low nutrient/minimal topsoil, to promote wildflower growth. Habitat creation will occur in suitable planting seasons as early as possible throughout the construction programme to reduce the time lag between habitat loss and habitat planting and establishment. Natural refugia comprising log piles will be created for small mammals, reptiles and amphibians using cleared vegetation. Unwanted logs from vegetation clearance and stones from ground works will be used to create piles close to newly created ponds. Split logs, dead wood, rocks and bricks, loosely filled with topsoil on gentle slope provide a good refuge and hibernaculum for great crested newts. Careful consideration of placement and design to maximise use and prevent possible flooding, drying out and aesthetic complaints from the public will be necessary. These details will be addressed as part of the detailed design.
B9	To achieve Biodiversity Net Gain	The achievement of Biodiversity Net Gain commitments relies on the above habitats being created and managed appropriately in order to reach the target condition, as follows: Individual trees – assumed to meet moderate condition in 27 years. Grassland with bulbs – assumed to meet moderate condition in four years. Species rich grassland – areas assumed to meet moderate and good condition in five and ten years respectively. Woodland – assumed to meet moderate condition in 15 years. Linear belts of shrubs and trees/shrubs with intermittent trees, shrubs, and scrub – assumed to meet moderate condition in five years. Waterbodies and associated plants – Assumed to meet moderate condition in three years. Banks and ditches sown with wet grassland – Assumed to meet moderate condition in four years. Wet grassland with marginal planting – Assumed to meet moderate condition in five years. Native species hedgerow – Assumed to meet moderate condition in five years. Native species rich hedgerow with trees – Assumed to meet moderate condition in ten years.
WE1	Minimising deterioration in surface water quality resulting from construction activities	The management plans to be developed as part of the EMP will address good site practice and the preparation of robust method statements (e.g., Guidance for Pollution Prevention (GPP)). An assessment of impacts from pollution during construction should align with CIRIA C648 which outlines potential impacts and mitigation measures. Measures will include:

Ref	Objective of the commitment	Description of the mitigation measure or commitment
		- Temporary works sites, haul roads and other associated works should be designed and maintained to minimise impact. - Where temporary watercourse diversions are required or in–channel working, specific mitigation strategies will be needed to ensure the temporary design is in line with the WFD and that temporary impacts are minimised. - Areas which may generate contaminated water, such as oil storage areas, will need to be bunded and have water discharged to self–contained units with treatment facilities. There would be no discharge to groundwater. - Tests will be undertaken to ensure contaminated material is identified, isolated, and reworked or removed to special landfill to avoid any leachate problems. Temporary land–take required for construction will include adequate areas of land set aside for robust control measures, for example sustainable drainage control.
WE2	Minimising deterioration in surface water quality resulting from operation of the Scheme	The design of the highway drainage system for the Scheme will comply with all current standards and sustainable drainage system (SuDS) best practice techniques to ensure that sustainability is a key drainage design criterion. Six highway drainage catchments utilise attenuation basins to mitigate the impacts on water quality. One highway drainage catchment utilises a wetland to mitigate impacts on water quality. Swales and vegetated ditches are also implemented to reduce any impact to Negligible.
WE10	Minimising deterioration in groundwater quality and quantity as a result of construction of the Scheme	A piling risk assessment will be carried out to ensure the selected piling method would not introduce contamination pathways into the aquifer. Deep foundations extending beneath the groundwater table will be designed in accordance with industry standards taking into account the site-specific water level monitoring data obtained from intrusive ground investigation for the Scheme. Areas which may generate contaminated water, such as oil storage areas, would need to be bunded and have water discharged to self–contained units with treatment facilities.
WE16-17	Minimising impacts on flood risk as a result of construction of the Scheme	Construction activities including temporary works, storage, and compounds within the functional floodplain will be minimised as far as possible. The Environment Agency flood warning system will be adopted during construction. A suitable flood management plan should be put in place to ensure effective and safe evacuation of personnel (plant and materials if safe to do so) from the areas at risk on receipt of a flood warning. To mitigate the impact of permanent earthworks within the wider floodplain, construction work will be phased so that floodplain compensation areas and the flood storage area are constructed prior to loss of floodplain volume to ensure no overall adverse impact.

Ref	Objective of the commitment	Description of the mitigation measure or commitment
		Compensatory floodplain to offset the volume of water displaced by the Scheme during the design flood, will be implemented prior to the removal of any existing floodplain. This includes a flood storage area between the M5 motorway and Withybridge Lane, and compensatory floodplain immediately east of the West Cheltenham Link Road, and alongside Staverton Brook.
WE22	Minimising impacts on flood risk as a result of operation of the Scheme	Run-off from the Scheme will be attenuated before reaching a watercourse for the 1 in 100 annual probability event (1%) taking into account a 25% allowance for climate change and hence there will be no increase in highways drainage discharge into receiving watercourses as a result of the Scheme.
LV1	Avoid damage to existing vegetation	Protection of retained vegetation (trees and hedges) in accordance with the AIA to avoid detrimental damage.
LV2	Minimise loss of vegetation	Removal of minimal extent of vegetation necessary for the works. Detail design to look to further reduce loss.
LV3	Reinstatement of lost vegetation providing a specific screening or amenity function	Replacement of woodland, scrub, hedges, trees and grass land and new suitable planting to new features, including wetland areas, link road and central reserves, to integrate Scheme into the landscape, reinstate screening effect and replace lost habitats wherever possible. Evergreen native/non-invasive species to be included where screening is a function.
LV6	Design of the noise barriers	Consult with LPA and directly affected receptors on options for the final design of noise barriers so that they provide visual amenity and/or biodiversity values as well as noise abatement.
LV8	Early planting of new vegetation	Consider early planting where this is identified for visual mitigation requirements where feasible within programme to allow planting to establish and the integration of the Scheme into the surrounding landscape sooner.
GS3	To prevent adverse risks to on-site and off-site human health, controlled waters, property and ecological receptors from the potential disturbance/ mobilisation of existing contaminated soil or groundwater and/or introduction of new sources of contamination (i.e. from spillages and leaks) during construction works.	A ground investigation has been undertaken which comprised laboratory analysis of soil and groundwater to identify potential signs of land contamination across the Scheme. An unacceptable risk to human health and controlled waters receptors was not identified from the data obtained. However, there is the potential for unidentified areas of land contamination to be present and construction activities could potentially introduce new sources of contamination (i.e., from spillages and leaks) and disturb and mobilise existing sources of contamination. Best practice measures will be implemented in the EMP (2nd iteration) including: • Health and safety risk assessments, method statements (RAMS) and appropriate Personal Protective Equipment (PPE) for the protection of construction workers in accordance with the Control of Substances Hazardous to Health (COSHH) Regulations.

Ref	Objective of the commitment	Description of the mitigation measure or commitment
		• Preparation of piling risk assessments as required in accordance with Environment Agency guidance to assess and manage potential risks to controlled waters. • Working methods during construction to manage groundwater and surface water appropriately and ensure that there is no run-off from the works, any material / waste stockpiles, and storage containers into adjacent surface watercourses in accordance with DEFRA and Environment Agency's guidance. • Stockpile management (such as water spraying and avoiding over stockpiling to reduce compaction of soil and loss of integrity) and timely removal of stockpiled soil to prevent windblown dust and surface water run-off. Addressed through MMP and SHMP. • Implementing appropriate fuel storage and pollution incident control e.g., plant drip trays and spill kits. Implementation of a contamination watching brief by suitably qualified and experienced personnel. If unexpected soil and/or groundwater contamination is identified during the ground investigation which poses a risk to sensitive receptors, appropriate investigations and remediation, if required, to be discussed and agreed with stakeholders and completed in accordance with current best practice.
GS4	To prevent adverse risks to on-site and off-site human health, controlled waters and ecological receptors during the operational phase associated with the potential introduction of new sources of contamination.	Design team to incorporate mitigation/remedial measures in the design of the Scheme to reduce impacts from contamination as required. The Scheme will be operated in accordance with the relevant regulations and best practice guidance in applying Best Available Techniques and pollution prevention.
PHH1	Effects on emergency vehicle movements through areas under construction traffic management, including from Cheltenham West Community Fire and Rescue Station	PC to develop and implement an Emergency Vehicle Movement Management Plan (see G4) as part of the Traffic Management Plan, for the movement of emergency vehicles and their access along the A4019 and the M5 during construction. This will need to apply to all emergency vehicles seeking to move through the Order limits under Blue Lights, and also egress from the West Cheltenham Fire Station for emergency response vehicles.
PHH2	Temporary disruption to access for community facilities during construction	PC to develop and implement temporary traffic management measures provide continuity of access and egress for all community facilities during the construction stage. This includes for the Cheltenham Civil Service Tennis and Football Clubs. A clear and consistent signage strategy will be designed and implemented to direct vehicle users during construction and to support access to community and

Ref	Objective of the commitment	Description of the mitigation measure or commitment
		recreational facilities, reflecting temporary changes to access arrangements. A clear and consistent signage strategy will be designed and implemented, to direct NMUs during construction and support access to community and recreational facilities; and bus stop provision, using footpaths and cycleways.
PHH3	Effectively informing people of construction works and traffic arrangements to enable forward planning and manage expectations around nuisance and disruption, in the interests of human health	PC tender evaluation process to include specific criteria relating to: • proposed communication and engagement methodology and resources, including dedicated Public Liaison Officer (PLO), in anticipation of requirement to implement a Community Engagement Plan for the Scheme (see G4, PHH4 and PHH9). • proposals for the provision of support for the local community by the PC, associated with a process to assess needs, monetary value, and definition of how this would be spent. • Considerate Contractors accreditation/ affiliation/ certification. track record in pro-active implementation of project-level community/stakeholder engagement plans.
PHH4	Effectively informing people of construction works and traffic arrangements to enable forward planning and manage expectations around nuisance and disruption, in the interests of human health	A Community Engagement Plan should be prepared and implemented, outlining the methods in which the local and surrounding community will be engaged during construction of the Scheme including contact details for key site management. The plan should provide consistent and clear communication to a range of stakeholders including, but not limited to residents, businesses, parish councils and local members (GCC and TBC). The plan must acknowledge the differing perspectives and issues of each stakeholder. The communication methods must seek to meet the inclusivity/accessibility needs of each stakeholder. The PLO (see PHH3 and 9) will lead the implementation of the Community Engagement Plan (see supplementary information (PHH9) about Community Engagement Plan content in relation to effects on human health determinants (mental health triggers)).
PHH5	Maintaining WCH access, connections to and availability of public transport during construction to avoid severance and loss of access to key services and facilities, in the interests of human health	Bus stop provision along the A4019 must been retained in line with Scheme proposals, ensuring public transport access along this corridor during construction. Public transport provision and rescheduling of services to reflect temporary stops should be discussed and agreed with local authorities, public bus companies and providers well in advance. Temporary stop relocation must be incorporated within the Traffic Management Plan (see G4) and should be based on targeted engagement to understand and respond to needs, to be led by the PLO. The PC should programme construction works so that affected PRoW, footpaths, or cycleways remain open for as much of the construction phase as is reasonably practicable and safe; and ensure that alternative routes are available as diversion routes for any temporary

Ref	Objective of the commitment	Description of the mitigation measure or commitment
		closures. The exception is bridleway ref. AUC1 which will be closed for the duration of the construction programme due to it being close to the main construction compound. No diversion route should exceed 250m overall additional length over the route that it is replacing. Temporary signalised crossing facilities should be provided along key WCH desire lines (including on the A4019 at Uckington) during the construction phase, as part of the Traffic Management Plan. A clear and consistent signage strategy will be designed and implemented, to direct users during construction and support access to community and recreational facilities; and bus stop provision, using footpaths and cycleways. Users of affected PRoW, footpaths and cycleways should be notified of planned diversions (including via information required as part of the Community Engagement Plan (PHH4)), with signs along sections to be closed during construction, at least one month prior to the works. Existing crossings and routes only to be diverted or closed once alternative routes are in place.
PHH6	Prevent adverse effects on human health determinants, derived from water, air and soil quality/pollutants and noise	PC to develop and implement a detailed Environmental Management Plan (2nd iteration) in accordance with the Environmental Management Plan (1st iteration), which will include measures for the construction phase, such as Best Practicable Means. The construction programme would also be kept to the minimum practicable time to reduce the duration of any landscape and visual impacts and areas would be cleared for construction as close as possible to works commencing and top soiling, reseeding, and planting shall be undertaken as soon as practicable after sections of work are complete. The EMP (1st iteration) will be used to inform the development of a post-construction monitoring programme, to be the responsibility of the Scheme promoter.
PHH7	Prevent adverse effects on human health determinants, derived from light pollution nuisance, disturbed sleep/night-time working	Work during hours of darkness would be avoided as far as practicable and, where necessary, directed lighting would be used to minimise light pollution/glare. Lighting levels would be kept to the minimum necessary for security and safety. In the operation of the Scheme, street lighting along the Link Road will be as per the Scheme design. Landscape planting for the Scheme will be as per the Environmental Masterplan. Sensitive design of noise barriers to ensure they provide visual as well as noise amenity (see also LV6).
PHH8	Minimising disruption to access for residents of the informal Traveller site adjacent to the M5	PC to maintain access to the informal Traveller site (adjacent to the M5) through fields to the north of the A4019 for the duration of the construction phase. The timing of the creation of this access will ensure that access is maintained to the informal Traveller site during construction of the Scheme.

Ref	Objective of the commitment	Description of the mitigation measure or commitment
		In operation of the Scheme, a new access track will be created to the north-east of the M5 Junction 10, as a replacement for the existing access points to the field areas and the informal Traveller site, that have been lost as a result of the new southbound off-slip.
PHH9	Prevent adverse effects on human health determinants relating to anxiety and stress and support those who experience difficulty adapting to change	Public Liaison Officer (PLO) full-time role to be filled for the duration of the construction phase. The PLO is expected to work directly with the contractor (and sub-contractors as appropriate), the Scheme Promoter (GCC) and nominated individuals representing the local community. Scope of role to include (but not be limited to): - Responsibility for development, implementation, monitoring and updating of the Community Engagement Plan (see below). - Proactive engagement with the local community, to include face to face introductions for directly affected stakeholders. - Physical and regular presence within the community. - Establishing the feedback loop, process and governance around implementing change in response to feedback during construction, where appropriate. - Commitment to responding to all communications, within agreed timescales and on an equitable basis, in cognisance of the GCC values in both representing and engaging with the local community. - Responsibility for managing communications, including Frequently Asked Questions. The PLO would be expected to provide regular updates and support at Scheme steering groups/board, in addition to the regular board updates that would be provided by the PC. A Community Engagement Plan should be prepared and implemented (by the PLO), outlining the methods in which the local and surrounding community will be engaged during construction of the Scheme including contact details for key site management. The Community Engagement Plan should provide consistent and clear communication to a range of stakeholders including, but not limited to residents, businesses, parish councils and local members (GCC and TBC). The Community Engagement Plan must acknowledge the differing perspectives and issues of each stakeholder. The communication methods must seek to meet the inclusivity/accessibility needs of each stakeholder. The PLO will lead the implementation of the Community Engagement Plan. The Community Engagement Plan should include (but not be limited to): - Contractor-led ‘Meet the Contractor’ events for supply chain to cover pre-planning and planning stages. - Contractor-led ‘Meet the Contractor’ share events for the local community. - Dedicated contact routes for the public and stakeholders, to include email, post, and telephone number.

Ref	Objective of the commitment	Description of the mitigation measure or commitment
		- Frequent and regular presence of the PLO and key Project personnel within the community, through public drop in surgeries or similar. - Mechanisms for the supply of frequent and regular updates on traffic management and closures, including signed diversion routes, throughout the construction phase, which should be developed to reflect all relevant planned traffic works (i.e. from other GCC projects). - Commitment to maintain/input to Scheme website with latest information throughout the construction phase. - Commitment to input to Scheme bulletins on a frequent and regular basis throughout the construction phase, covering progress, upcoming activities and traffic management and closures. - Process for generating change within the Scheme in response to feedback, using the Compensation Event procedure.
PHH10	Minimising impacts on people from temporary land take (see also GS1)	The phasing of temporary land take for construction works should be planned in consultation with affected landowners (led by the PLO and PC, in accordance with the Community Engagement Plan) to enable early release of land and thereby minimise the extent of disruption. Land acquired temporarily for construction compounds and working areas will be restored to a condition equivalent to its original use, or such other condition as agreed with the relevant landowner, before being returned to its owner. Land within the Order limits that is not within the permanent footprint of the Scheme will be restored to its original use in agreement with landowners. Restoration of land occupied or disturbed during the construction process that is not permanently acquired for engineering and landscaping, will be subject to an aftercare period – during this agreed period any issues arising (e.g., settlement, drainage and weed infestation) will be rectified.
PHH11	Managing impacts on residential receptors (access)	PLO to prioritise direct liaison with owners/occupants of residential receptors anticipated to experience direct impacts on access during the construction phase, to ensure that suitable access and egress to their property is available at all times during the construction phase. This is to include (but not be limited to) residents at Homecroft Drive, Cooks Lane and along the A4019.
PHH12	Managing impacts on business receptors (access)	PLO to prioritise direct liaison with owners/lessees of business premises anticipated to experience direct impacts on access during the construction phase, to ensure that suitable access and egress to their property is available at all times during the construction phase, for all relevant business activities (i.e. staff and patron access, deliveries and servicing). This is to include (but not be limited to) businesses at Gallagher Retail Park and businesses accessed from

Ref	Objective of the commitment	Description of the mitigation measure or commitment
		Cooks Lane, as well as those experiencing land take and disruption to access arrangements.
PHH13	Managing impacts on community receptors (access)	PLO to prioritise direct liaison with operators/lessees of community facilities/premises anticipated to experience direct impacts on access during the construction phase, to ensure that suitable access and egress to their property is available at all times during the construction phase, for all relevant activities (i.e. staff/operator and patron access, deliveries and servicing).
PHH14	Enhancing opportunities for education and training, including through job creation	The construction phase may be a source of employment for local people. In addition to the requirement for the contractor to commit to hosting a meet the contractor supply chain event, recruitment should be supported through local job centres. GCC will expect the PC to incorporate measures to use the local supply chain effectively and including these as part of social value tender evaluation criteria. Ensure recruitment for construction jobs and procurement of goods and services starts at district and regional levels to ensure that the employment and economic benefits for the construction phase are realised in the district and region.
PHH15	Providing accurate information to minimise temporary disruptions to access to development land and businesses	For temporary disruptions to access to development land and businesses, a clear and consistent signage strategy will be designed and implemented to direct motorists during construction and to support access to business and retail destinations, reflecting temporary changes to vehicular access arrangements. A clear and consistent signage strategy will be designed and implemented, to direct pedestrians and cyclists during construction and support access to business and retail facilities; and bus stop provision, using existing or replacement/temporary footpaths and cycleways.
PHH16	Minimising construction stage impacts to local residents in a targeted and responsive manner	PLO to liaise with local residents along and with key access via the A4019 (including Uckington and Cooks Lane) in order to discuss the sequence of construction works and explore/agree the potential merits of temporary measures such as (but not limited to) siting of acoustic barriers and hoardings as part of the establishment and progression of construction works along the A4019; and provision of public transport infrastructure or community transport options (e.g. for residents of Cooks Lane).
PHH17	Informing the local community of the improvements to accessibility, and connectivity	A communications plan for the community to be produced in the early stages of the operational phase of the Scheme, with an aim of informing the local community (particularly residents, employees of premises in the Scheme area, road users and walkers, cyclists and horse riders) of the improvements and encouraging their full use (for example enhanced accessibility and new connections).
PHH18	Safe access for pedestrians and cyclists through areas	Contractor to provide sufficient space (pavement width for example) to allow pedestrians, including wheelchair and

Ref	Objective of the commitment	Description of the mitigation measure or commitment
	under traffic management.	pushchair users; and cyclists to travel safely through areas under traffic management.
C1	Reducing the impacts of extreme weather on construction processes/activities	Manage potential adverse impacts on construction processes that could occur during extreme weather. For example: - During a heatwave the construction programme and activity Schedule may need to be reviewed with those activities that are less vulnerable to the hot weather being prioritised. - During drought the construction Schedule may be vulnerable to disruption if water availability is limited. - Heavy rain could inundate the site, prevent access to the site and/or disrupt supply chains for construction materials. - During fog, lightning, or high winds it may not be possible to work safely, for example operating tall cranes or erecting scaffolding for work on bridges. - Construction staff health issues (e.g., heat stroke, dehydration, respiratory problems) could accompany work during a heatwave and/or time of reduced air quality (often associated with warmer temperatures).
CEA1	Reducing adverse inter-project cumulative construction impacts of the Scheme and other GCC and NH highways projects disrupting movement across the strategic and local transport network	PC will be required to submit all phasing plans associated with the management of construction traffic (as part of the Traffic Management Plan) to the GCC streetworks manager on a rolling monthly basis. This will ensure co-ordinated consideration of all streetworks intervention information across projects, capturing all booking system requests for diversions on the GCC highway network; and works will not be implemented until approval and endorsement by GCC is attained. PC may be required to adapt proposals and scheduling in response to streetworks manager requests. The PLO will be required to coordinate dissemination of accurate network disruption information in advance, in accordance with the Communication Engagement Plan. This information should incorporate interfaces with other project impacts on the transportation network, to the extent that they are known (see also PHH4 and PHH9).
CEA2	Seeking to secure the continued efficacy and realise long term benefits of the Scheme environmental design in the context of strategic development sites, to manage inter-project cumulative effects	GCC is committed to seeking to establish the right level of discussion, meeting, planning, coordination of programmes and engagement with the public and other stakeholders between GCC officers, the Scheme PC and relevant developers of the safeguarded land to the north-west of Cheltenham, the North West Cheltenham Development Area and the West Cheltenham Development Area. The aim of these endeavours by GCC will be to ensure that proposals for change at these locations complement the intentions of the Scheme, particularly in relation to securing functional ecosystems that continue to support the protected species known to be present in the study area; building on the landscape structure; maintaining connectivity for WCH routes; as well as engaging meaningfully with local communities and

Ref	Objective of the commitment	Description of the mitigation measure or commitment
		stakeholders to support people in adapting to transformational change. The environmental design for the Scheme (Environmental Masterplan (Aapplication document TR010063/APP/ 2.13)) has been developed to dovetail with the published masterplan that accompanies the outline application that has been made for the Elms Park proposals at the North West Cheltenham Development Area (application reference 16/02000/OUT). Detailed design of the Scheme offers further opportunities for the interface with the Elms Park proposals to be refined, subject to the timeframes of third party developers. Maintenance of the Scheme environmental measures is part of LV3. Correct maintenance of new vegetation is part of LV4.
CEA3	Managing the inter-project cumulative construction impacts of the Scheme, with the addition of activities from strategic development sites, on residential communities at Uckington, along the A4019, B4634 and at Withybridge Lane.	GCC is committed to seeking to establish the right level of discussion, meeting, planning, coordination of programmes and engagement with the public and other stakeholders between GCC officers, the Scheme PC and relevant developers of the safeguarded land to the north-west of Cheltenham, the North West Cheltenham Development Area, and the West Cheltenham Development Area. The aim of these endeavours by GCC will be to ensure that proposals for change at these locations complement the intentions of the Scheme (see CEA2) and that all developers co-ordinate to engage meaningfully with local communities and stakeholders to support people in adapting to transformational change. This engagement should allow a route for members of the community to be informed, supported and influential in shaping how construction activities from all strategic developments are managed, allowing a route for pro-active prevention, as well as reactive response to issues emerging, particularly around noise, disturbance, and community anxiety. The PLO and CEP proposals for the Scheme (see PHH4 and 9) will establish consultation and engagement routes and mechanisms. GCC will seek to encourage developers to integrate or build on these relationships as their proposals unfold, in cognisance of GCC values.
Relevant aspects of the Scheme design		
SD1	Scheme design: Junction changes on the A4019	Scheme design (see General Arrangements Plans (Aapplication document TR010063/APP/2.9)) incorporates specific elements of access improvements within junction design. The following changes will be made to the existing junctions on the A4019, alongside the creation of three new junctions. For residents and businesses whose current access is directly onto the A4019 (for example those in Uckington, and along the southern side of the A4019 in north-west Cheltenham), short sections of new access roads will be created alongside the widened

Ref	Objective of the commitment	Description of the mitigation measure or commitment
		A4019 to facilitate ease of access both westbound and eastbound and will join the A4019 at signalised junctions. • Stoke Road – no change made to the existing junction. • Stanboro Lane – existing junction location retained, with minor changes made to the mouth of the junction. Left and right turning from the junction retained. • Withybridge Lane – existing junction location retained, but access changed to left turn into Withybridge Lane, and left turn only out onto the A4019. • Cooks Lane – existing junction closed, with access from Cooks Lane to the A4019 diverted through to the Link Road via a new access road. • The Green and Moat Lane – modified to form a single signalised crossroads. • West Cheltenham Fire Station – access for emergency vehicles retained with left and right turning onto the A4019. Access for non-emergency vehicles diverted onto a new access road and joining the A4019 at a new junction (referred to as Site Access B). • Homecroft Drive and Sandpiper Drive - existing junctions closed, with access to the A4019 diverted through to the Site Access B junction via a new access road. • Civil Service Sports Ground – existing junction location retained but changed to a signalised crossroads (the Site Access B junction). For traffic westbound on the A4019, the right turn at this junction will be for buses only. • B4634 (Hayden Road) – the Gallagher Junction. Existing junction location retained, but with the layout changed. This will become the Site Access C junction into the proposed North West Cheltenham Development site.
SD2	Scheme design: Active Travel Corridors	The layout and design for facilities for pedestrians and cyclists are shown in the General Arrangements Plans (Aapplication document TR010063/APP/2.9). The Scheme design includes an active travel corridor along the length of the Link Road and the A4019 (within the extents of the Scheme). This will provide traffic free space for cyclists and pedestrians with the objective of reducing car journeys through the Scheme and thereby reducing noise and air quality impacts, as well as providing exercise opportunities for people. The Link Road has a segregated cycleway (3m in width) and footway (2m in width) all the way along its west side. To the west of the junction, the Scheme will provide a parallel cycle and pedestrian crossing of the B4634, incorporated into the signalised junction, to allow the

Ref	Objective of the commitment	Description of the mitigation measure or commitment
		future continuation of the proposed cycling and pedestrian route into the West Cheltenham Development Area. The Scheme will include a segregated cycleway (3m width) and footway (2m width) on the northern side of the A4019, which with the exception of a short section of shared use path through Uckington will extend from the junction of the A4019 with Stanboro Lane in the west through to the Gallagher junction at the eastern end of the Scheme. This active travel corridor will provide connectivity for pedestrians and cyclists between north-west Cheltenham and the junction of the A4019 and Stanboro Lane (west of M5 Junction 10). It will tie into an existing shared use path at the eastern end of the Scheme, and an existing footway at the western end. The B4634 will be widened to the south of its existing alignment to allow for the provision of a 2m wide shared use path along the northern verge through to the junction of the B4634 and Withybridge Lane. This will provide a connection between the walking and cycling provision on the Link Road and Withybridge Lane.
SD3	Scheme Design: Relocation of bus stops	The locations of the existing bus stops along the A4019 were reviewed with the following changes made as a result of the Scheme: • Stanboro Lane bus stops (west of Junction 10) will not be re-provided due to the limited number of properties at that location and the proximity of the Gloucester Old Spot bus stops to the west, which will be retained. • Withybridge Lane bus stops will not be re-provided due to the removal of all existing properties at that location. • Cooks Lane bus stops are to be re-located closer to Uckington and the proposed signalised crossing facilities. The eastbound and westbound stops are located as in lane stops just to the east of the junction of The Green and the A4019 in Uckington. Pedestrian access is provided to both from the signalised junction in Uckington. • Bus stops adjacent to the Elms Park development are to be re-provided and will be located as layby stops between Site Access A and Site Access B. Pedestrian access is provided to both from the signalised junction at Site Access A. Pedestrian access will also be possible to the westbound stop from the adjacent access road, through a gap in the noise barrier. • An additional pair of bus stops located at the eastern extents of the Scheme are also likely to be re-provided part of the detailed design. These additional bus stops would be adjacent to the Sainsburys store. The proposed bus stops adjacent to the Elms Park development are considered the most likely to have high usage due to the suitability of this location to serve the Elms Park development. These proposed stops have

Ref	Objective of the commitment	Description of the mitigation measure or commitment
		therefore been upgraded to lay-by type bus stops, rather than in-lane stops
SD4	Scheme Design: Access for properties at Uckington	Scheme design (see General Arrangements Plans (~~a~~Application document TR010063/APP/2.9)) incorporates specific elements of access improvements for properties to the north and south of the A4019 at Uckington. WCH access to the Shared Use Path and realignment of the junction between Moat Lane and the A4019 in Uckington with phase crossing provision.
SD5	Scheme Design: Junction Design for Strategic Sites	Junction design (see General Arrangements Plans (~~a~~Application document TR010063/APP/2.9)) incorporates primary access into these strategic sites (North West Cheltenham Development Area; West Cheltenham Development Area; and safeguarded land to the north-west of Cheltenham) from the A4019 and B4634. Three new junctions will be created to provide access into the proposed North West Cheltenham Development Area: • A slip lane – opposite the West Cheltenham Fire Station for eastbound traffic on the A4019 into the North West Cheltenham Development Area. • Site Access A – a signalised T-junction opposite Homecroft Drive. • Site Access B – a signalised crossroads incorporating the existing access from the Civil Service Sports Ground. The new access road from the West Cheltenham Fire Station, Homecroft Drive and Sandpiper Drive will feed into the southern arm of this junction. To provide improved access for buses, bus gates eastbound along the A4019, into Site Access A and Site Access B, have been included in the preliminary design. In addition, a bus lane and a bus gate have been included respectively on the A4019 eastbound, between Site Access A and the Gallagher junction, and eastbound into the Gallagher junction.
Relevant aspects of the Traffic Management Plan		
SD6	Managing access during construction	Withybridge Lane is to be retained as it provides access to several farms and farmland. Access will be maintained from the B4634 for the duration of the works. Access from the A4019 will be closed while the new junction is constructed. Access is to be maintained throughout construction to Cooks Lane, Moat Lane, and Green Lane, either directly from the A4019 or by local diversions. Provide temporary signalised crossing facilities on the A4019 at Uckington during the construction phase, as part of the traffic management plan.
SD7	M5 Junction Movements during construction	The existing M5 Junction 10 traffic movements are to be retained until such time as closure of the southbound off slip and northbound on slip are necessitated by the construction phasing of the interchange construction.

Ref	Objective of the commitment	Description of the mitigation measure or commitment
		Contraflow on the M5 is to be kept to the minimum duration consistent with safely and efficiently constructing the Scheme. M5 closures are minimised as far as is practicable.
SD8	Specific Noise Controls	Consider the placement of enhanced noise barriers near residential clusters likely to host young families, in Springbank, and the elderly.

13.15. Residual effects – Human Health

13.15.1. The methodology for assessing human health requires impacts to be identified and conclusions to be drawn about the general character of health outcomes that would arise as a consequence – whether they are positive, neutral or negative. There is no requirement in DMRB LA112 to seek to categorise effects nor assign significance. Notwithstanding this, IEMA guidance has been used to assign significance to the health outcomes.

13.15.2. This section summarises the impacts that have the potential to result in significant effects once approaches to avoiding, lessening, or mitigating effects have been taken into account. The summary assumes that both embedded and essential mitigation measures are fully implemented, resulting in the identification of significant residual effects.

Wider population

13.15.3. The wider population sub-group has been assessed as experiencing **large adverse residual construction effects** in the rural context and **moderate adverse residual construction effects** in the urban context due to demolition proposed as part of the Scheme. The Scheme requires the demolition of 32 private properties as described in Table 13-11 and reiterated here:

- Three residential properties in the vicinity of Sheldon Nurseries on Stanboro Lane to the north of the A4019 and west of the M5.
- All fourteen residential properties at Withybridge Gardens, plus associated garages, and garden outbuildings.
- Two residential properties at Withy Bridge, to the north of the A4019 near Withybridge Lane, plus associated garages and garden outbuildings.
- Three residential properties at Uckington, to the south of the A4019.
- Ten residential properties (comprising five semi-detached buildings) to the east of the West Cheltenham Fire Station.

13.15.4. There is no mitigation for this – it is a matter for compensation through the compulsory purchase process and sits outside the scope of the ES. For human health the residual adverse effect is therefore **significant.**

13.15.5. The wider population sub-group has been assessed as experiencing **moderate adverse residual construction effects** due to the following impacts:

- Changes in air quality (rural context).
- Changes in the noise climate (rural context).
- Changes in landscape amenity (urban and rural context).

13.15.6. The **moderate adverse residual construction effects** are **significant.** Essential mitigation has been proposed that includes further engagement and the development of collaborative solutions with the affected residents as well as dynamic feedback

opportunities that will allow emerging issues to be addressed through the construction phase. Depending on how this mitigation manifests in practice, there is the potential for the significance to be reduced.

13.15.7. No other significant adverse or beneficial residual effects are predicted for the wider population in the construction phase.

13.15.8. Changes to landscape amenity has been assessed as giving rise to **moderate adverse residual effects** in the operational phase future year scenario for the wider population, which are **significant**.

13.15.9. One impact type – access – has been assessed as giving rise to **moderate beneficial residual effects** in the operational phase for the wider population, which are **significant**.

13.15.10. No other significant residual effects are predicted for the wider population in the operational phase.

Population sub-groups

13.15.11. The impacts of changes to landscape amenity on determinants of human health have been assessed as **large adverse residual construction effects, which are significant,** disproportionately affecting families with children and adolescents; and physically or mentally disadvantaged people.

13.15.12. A number of **moderate adverse residual construction effects, which are significant** have been identified for population sub-groups, as follows:

- Changes in air quality, affecting families with children and adolescents; and physically or mentally disadvantaged people.
- Changes in the noise climate, affecting families with children and adolescents; and physically or mentally disadvantaged people.
- Separation from open space and recreational destinations, affecting families with children and adolescents; and physically or mentally disadvantaged people.
- Disruption to access to facilities and services that support physical and mental health and well-being, affecting all four identified population sub-groups (families with children and adolescents; physically or mentally disadvantaged people; materially disadvantaged people; and people from black or minority ethnic (BME) groups).
- Reductions in safety for all transport modes, affecting all four identified population sub-groups.

13.15.13. A **moderate beneficial residual construction effect** has been identified for vocational opportunities associated with construction works, disproportionately benefitting materially disadvantaged people; and people from BME groups.

13.15.14. No other significant adverse or beneficial residual effects are predicted for the population sub-groups in the construction phase.

13.15.15. Two types of **beneficial residual operational effects, which are significant** have been identified for population sub-groups, as follows:

- Improvements in safety for all transport modes, assessed as **moderate beneficial and significant** for all four population sub-groups in OY and FY.
- Improvements in access to facilities and services that support physical and mental health and well-being, affecting all four identified population sub-groups – **moderate beneficial** in OY; and **large beneficial** in FY.

13.15.16. No significant residual adverse effects are predicted for the population sub-groups in the operational phase.

Geographic sub-populations

13.15.17. Two geographic sub-populations have been assessed as experiencing **very large adverse residual construction effects** due to demolition proposed as part of the

Scheme. The Scheme requires the demolition of 32 private properties as described in Table 13-11 and reiterated here:

- Three residential properties in the vicinity of Sheldon Nurseries on Stanboro Lane to the north of the A4019 and west of the M5.
- All fourteen residential properties at Withybridge Gardens, plus associated garages, and garden outbuildings.
- Two residential properties at Withy Bridge, to the north of the A4019 near Withybridge Lane, plus associated garages and garden outbuildings.
- Three residential properties at Uckington, to the south of the A4019.
- Ten residential properties (comprising five semi-detached buildings) to the east of the West Cheltenham Fire Station.

13.15.18. The affected groups are residents of properties at Homecroft Drive and Appleyard Close (north); and residents of properties at Withybridge Gardens and Stanboro Lane (including Sheldon Cottages) and Withybridge Lane (around M5 Junction 10) - Table 13-11. There is no mitigation for the demolition of properties – it is a matter for compensation through the compulsory purchase process for directly affected residents and sits outside the scope of the ES. The assessment recognises also that there will be a loss of sense of community for the remaining residents and that this may have adverse health effects, which could be significant depending on the capacity of household members to adapt.

13.15.19. Two **very large adverse residual construction effects, which are significant** have been identified due to the impacts on determinants of physical and mental health and well-being due to changes in landscape amenity. They affect the following geographic sub-groups:

- Residents of properties at Uckington, Moat Lane and Cooks Lane.
- Residents of properties at Withybridge Gardens and Stanboro Lane (including Sheldon Cottages) and Withybridge Lane (around M5 Junction 10).

13.15.20. The landscape impacts on human health for users of the PRoW and WCH network are assessed as **large adverse residual construction effects, which are significant.**

13.15.21. Four categories of **moderate adverse residual construction effects, which are significant** have been identified due to the impacts on determinants of physical and mental health and well-being as follows:

Access impacts:

- Residents of properties at Uckington, Moat Lane and Cooks Lane.
- Residents of properties at Homecroft Drive and Appleyard Close (north).
- Users of the PRoW and WCH networks.

Severance/separation impacts:

- Users of the PRoW and WCH networks.

Safety impacts:

- Users of the PRoW and WCH networks.

Landscape impacts:

- Residents of properties adjacent to the B4634 (including Hayden).

13.15.22. No other significant adverse or beneficial residual effects are predicted for the geographic sub-groups in the construction phase.

13.15.23. A number of **beneficial residual operational effects, which are significant** have been identified for geographic sub-groups due to improvements in access to facilities and services that support physical and mental health and well-being, as follows:

- Residents of properties at Uckington, Moat Lane and Cooks Lane (**large beneficial at OY and very large beneficial at FY**).
- Residents of properties at Withybridge Gardens, Stanboro Lane and Withybridge

Lane (**large beneficial at OY and very large beneficial at FY**).

- Users of PROW and the WCH network (**large beneficial at OY and very large beneficial at FY**).
- Residents of properties at Homecroft Drive and Appleyard (**large beneficial at OY and FY**).
- Residents of properties at north-west Cheltenham (**moderate beneficial at OY and FY**).
- Residents of properties at Springbank (**moderate beneficial at OY and FY**).
- Residents of properties adjacent to the B4634 **(moderate beneficial at OY and large beneficial at FY**).
- Residents of properties at Swindon Village (becoming **moderate beneficial at FY**).

13.15.24. Two types of **beneficial residual operational effects, which are significant** have been identified for users of the PRoW and WCH networks. Safety improvements are assessed as delivering **large beneficial residual effects OY and FY**; and the effects of access improvements are assessed as **large beneficial at OY**, rising to **very large beneficial at FY.**

13.15.25. Two **moderate adverse residual operational effects** have been identified due to landscape impacts, both of which are significant. They affect residents of properties adjacent to the B4634; and residents of properties at Withybridge Gardens and Stanboro Lane (including Sheldon Cottages) and Withybridge Lane (around M5 Junction 10.

13.15.26. No other significant residual adverse effects are predicted for the geographic sub-groups in the operational phase.

Community assets

13.15.27. The West Cheltenham Fire Station has been assessed as experiencing **moderate adverse residual construction effects** due to changes in access.

13.15.28. The Cheltenham Civil Service Tennis and Football Club has been assessed as experiencing **moderate adverse residual construction effects** due to changes in noise.

13.15.29. **Large beneficial residual operational effects at OY and FY** have been identified due to the impacts on determinants of physical and mental health and well-being associated with improved access at both West Cheltenham Fire Station and Cheltenham Civil Service Tennis and Football Club.

Employment and training assets

13.15.30. Three **moderate adverse residual construction effects** have been identified due to access impacts, which are significant. They affect employees and students at Greensteps; the employees at Gallagher Retail Park and Kingsditch Trading Estate; and the employers and employees of businesses adjacent to the A4019.

13.15.31. A **large adverse residual construction effect** which is significant has been identified due to landscape impacts affecting employers and employees to businesses adjacent to the A4019.

13.15.32. A number of **beneficial residual operational effects, which are significant** have been identified for employment and training assets due to improvements in access, variously benefitting employers, employees and students, supporting physical and mental health and well-being, as follows:

- Employees and students at Greensteps (**large beneficial at OY and FY**).
- Employees at Gallagher Retail Park and Kingsditch Trading Estate (**moderate beneficial at OY and large beneficial at FY**).
- Employers and employees to businesses adjacent to the A4019 (**large beneficial at OY and very large beneficial at FY**).

13.16. Cumulative effects

13.16.1. This sub-section provides consideration of the cumulative effects of the Scheme in the context of the Population and Human Health topic. In addition to intra-Scheme and inter-project cumulative effects within the topic, reporting is provided on the relevant cumulative Population and Human Health effects of the temporary period of M5 Junction 10 slip road closures, underpinned by a sensitivity assessment that has been undertaken through traffic modelling, air quality and noise assessment.

M5 Junction 10 slip road closures sensitivity assessment

13.16.2. As part of the construction phase, there is a requirement for the existing M5 Junction 10 slip roads to be closed. As set out in Table 2-1 of Chapter 2 (~~a~~Application document TR010063/APP/6.2), the existing south bound off slip is programmed to close to all traffic in month 11, with the existing north bound on slip being closed to all traffic in month 15. There is then a period of five months when both existing M5 Junction 10 slip roads are closed before the new south bound off slip will be opened (month 20), with the new north bound on slip programmed for opening in month 30. The new south bound on slip is scheduled to open in month 27 and the new north bound off slip is scheduled to open in month 29. The new junction will therefore be fully accessible for all movements at month 30.

13.16.3. A sensitivity assessment has been undertaken to understand the likely traffic impacts arising from these sequential changes to access to the M5 Junction 10 via the slip roads. This modelling work has enabled analysis of the consequential air quality and noise implications of traffic reassignment across the local road network during the temporary period of M5 slip road closures, within the construction phase of the Scheme. The technical results of this sensitivity assessment are provided in Chapter 5 (Air Quality) and Chapter 6 (Noise and Vibration) of the ES (~~a~~Application documents TR010063/APP/6.3 and TR010063/APP/6.4, respectively).

13.16.4. In turn, this has enabled a qualitative consideration of the in-combination effects of these air quality and noise impacts, as well as changes to traffic levels and traffic composition (e.g. changes in the percentage of Heavy Duty Vehicle (HDV) usage) for the receptors relevant to the Population and Human Health assessment. This comprises an in-combination cumulative effect on amenity and established characteristics of the affected residences/ residential settlements.

13.16.5. The recognised methodology for air quality assessment does not require the impacts of temporary diversions to be assessed, based on a definition of 'temporary' that equates to less than 24 months. The total duration of the M5 Junction 10 slip road closures is 19 months, which places it beneath this threshold. Irrespective of this, the lead air quality assessor has undertaken a review of the potential implications of the temporary traffic re-routing to inform consideration of amenity effects. This has concluded that there are no receptors anticipated to experience adverse effects sufficiently significant to cause health concerns; and that there is no unacceptable risk of exceedances of air quality thresholds within the Cheltenham AQMA. Air quality effects throughout are considered to be no worse than negligible adverse throughout the study area considered for the sensitivity assessment.

13.16.6. The air quality impacts review used the traffic data to identify the bounds of an affected route network for changes in air quality. This is broadly commensurate with that derived for the noise assessment, as depicted in the figures that support the noise implications of the sensitivity assessment: Figures 6-18 – 6-23 in Appendix 6.1 (Application document TR010063/APP/6.15).

13.16.7. Two sections of the local road network have been assessed as likely to experience major adverse noise effects due to the combined M5 Junction 10 slip road closures. The data estimates the daytime changes at the road connecting Elmstone Hardwick to Uckington, over the M5 and at Piffs Elms Road/Boddington Road as being 6dB. There is also a small section of Pamington Lane affected in a similar manner. Increases in traffic in these locations are also associated with minor adverse effects on access and severance, as

well as landscape amenity, and moderate adverse effects in terms of transport characteristics.

13.16.8. Additional minor changes in noise have been determined on the B4063, the B4079, the A38 (Jubilee Way), Stoke Road, the road through Fiddington, Hatherley Road, Hayden Road and some small sections of road around Bishops Cleeve.

13.16.9. Traffic flows along the A4019 are predicted to decrease for the duration of the M5 Junction 10 slip road closures. This has been assessed as resulting in beneficial effects on noise levels for the length of the road within the study area – these range from minor beneficial closest to Cheltenham, to moderate beneficial in the vicinity of Uckington, then major beneficial on the approaches to the existing M5 Junction 10. The reduction in traffic is also associated with moderate beneficial effects in terms of the characteristics of the transport environment and minor beneficial effects in terms of accessibility and reduced severance, as well as landscape character.

13.16.10. At night the distribution and magnitude of the predicted changes in noise are very similar.

13.16.11. Moderate to major increases in noise were predicted on the southern slip roads of the Gallagher Road Junction, in the daytime and night-time, but due to the A4019 and Hayden Road being the dominant noise sources in this area, the predicted change at the junction is unlikely to be perceptible at any noise sensitive receptor, including Greensteps, National Star, which is a centre supporting individuals with additional needs and sensory conditions.

13.16.12. The characteristics of the in-combination impacts are not considered to fall within the scope of the Population assessment – their temporary duration and transient nature of passing traffic are not considered to materially contribute to changes in the key rural characteristics of the affected neighbourhoods. In the context of the Human Health assessment, consideration has been given to the impacts of the temporary changes in traffic movements on the following determinants of human health, adopting a qualitative approach using professional judgement:

- Access to community (incorporating healthcare), recreational and educational facilities (including vocational training opportunities), including the location and type of facilities and severance/separation of communities from such facilities.
- Access to green space and open space including the location and type of facilities and severance/separation of communities from such facilities.
- The spatial characteristics of the transport network across all modes and usage in the study area.
- Air quality, including consideration of AQMAs and ambient air quality.
- Noise environment and vibration, including areas recognised as being sensitive to noise.
- Landscape amenity.

13.16.13. The study area under consideration for the human health effects comprises predominantly residential receptors in the rural context. There is some cross-over with receptors identified for the main assessment, as referenced in Table 13-47 and the full scope of receptors considered in the sensitivity assessment is as follows:

- Employees and students at Greensteps, National Star – high sensitivity to change.
- Members of the community of Uckington – high sensitivity to change.
- Members of the wider population (rural context), covering Fiddington, Elmstone Hardwicke, Boddington, Pamington and Gotherington – medium sensitivity to change.
- Members of the wider population (urban context), covering Bishops Cleeve – low sensitivity to change.
- Families within children and adolescents (rural and urban context) – high sensitivity to change.

13.16.14. The sensitivity assessment is only relevant to a defined period within the construction phase. There is no implication for the operational phase. In the relevant part of the construction phase, instances of receptors experiencing multiple impacts from the M5 slip road closures within the Scheme are summarised as follows, noting that there are few discernible differences highlighted for individuals with protected characteristics, since there is insufficient granularity in the data for a full demographic analysis to be undertaken:

- **Employees and students at Greensteps, National Star** - changes to access arrangements (slight to moderate beneficial), changes to transport network characteristics (moderate beneficial), changes to air quality (slight beneficial), noise (moderate beneficial) and landscape amenity (slight to moderate beneficial).
- **Members of the community of Uckington -** changes to access arrangements (slight to moderate adverse in the village), changes to transport network characteristics (moderate adverse in the village, minor to moderate beneficial along the A4019), changes to air quality (slight adverse in the village, slight beneficial along the A4019), noise (large adverse) and landscape amenity (slight to moderate adverse).
- **Wider population (rural context) –** changes to access arrangements (slight adverse), changes to transport network characteristics (moderate adverse), changes to air quality (slight adverse), noise (moderate to large adverse) and landscape amenity (slight adverse).
- **Wider population (urban context)** - changes to access arrangements (negligible adverse), changes to transport network characteristics (slight adverse), changes to air quality (negligible adverse), noise (slight adverse) and landscape amenity (neutral).
- **Families with children and adolescents** - changes to access arrangements (slight to moderate adverse), changes to transport network characteristics (moderate to large adverse), changes to air quality (slight adverse), noise (moderate to large adverse) and landscape amenity (slight to moderate adverse).

13.16.15. These predicted effects on noise, access/severance, transport network characteristics and landscape amenity are due to changes in the amount of vehicles, but particularly the increase in the number of HDV both in absolute terms and as a proportion of through movements. This type of vehicle is more intrusive in the rural context and therefore has greater impacts on character, particularly in the more rural context. HDVs also bring a greater risk of modal conflict. These factors are reflected in the judgements made in this sensitivity assessment.

13.16.16. Given the disproportionate impacts of the HDV movements, an additional traffic modelling scenario was carried out for the M5 Junction 10 slip road closures and diversion routes which included an exclusion of HDV on some of the roads that were predicted to experience a significant change in noise. This included the sections of the B4079 at Pamington Lane, the road from Elmstone Hardwicke to Uckington and the road through Boddington and Staverton. As a result of large, predicted increases in the number of vehicles using the B4079, the Green and the road through Boddington, the HDV removal in the modelling did not improve noise levels on these roads. Even in areas where the HDV removal does not show reduced noise based on modelled traffic flows, it would still improve the character of the noise in the context of impacts on human health determinants. If effective, measures to divert traffic from using the B4079, the Green and the road through Boddington (secured through measure G10 of the REAC (Application document TR010063/APP/7.4) would minimise the predicted adverse noise impacts.

13.16.17. Given that the scenario leading to the in-combination cumulative effects on amenity described is temporary, lasting less than 19 months in the construction phase in total, residential receptors experiencing these changes would not be eligible for noise insulation. Management of diversion route traffic will be delivered through the Traffic Management Plan (measures G4 and G10 in the REAC (Application document: TR010063/APP/7.4)). Diversion routes will be put in place for traffic seeking to join the M5 at Junction 10 to travel northbound; and southbound traffic seeking to exit the M5 at Junction 10 and signage will be implemented to discourage the use of the local road network by HDVs, except where access is required. These measures are anticipated to

reduce the magnitude of noise impacts at a number of locations. In addition, measures PHH7 and PHH9 in the REAC (Application document: TR010063/APP/7.4) provide reactive controls for people experiencing light pollution, noise, and other causes of nuisance, through the scope of activities, responsibilities, and ability to take corrective action that is afforded to the PLO.

13.16.18. Taking account of the mitigation, the residual effects of the M5 Junction 10 slip road closures on these communities are considered to include the following significant adverse cumulative human health effects for the more sensitive affected receptors, on a precautionary basis:

- **Residents of Uckington** – moderate adverse cumulative effects, principally due to changes in noise and to landscape amenity, affecting the characteristics of the settlement.
- **Families with children and adolescents (rural and urban context)** – moderate adverse cumulative effects, principally due to changes in noise and the characteristics of the transport network.

13.16.19. The sensitivity assessment has highlighted the potential for the M5 Junction 10 slip road closures to contribute to some beneficial effects for the students and staff at Greensteps, National Star. This is principally due to the reduction in traffic flows along the A4019; however, the benefits may be lessened by proximity to the B4634/A4019 junction. The benefit is therefore noted, but there is insufficient certainty relating to the routes that traffic will use during the M5 Junction 10 slip road closures to state that it will be significant.

Intra-Scheme in-combination cumulative effects assessment (single project impacts) within topic

13.16.20. The focus of the intra-Scheme CEA is understanding how receptors may experience a number of different types of impacts from the Scheme at the same time. Within the topic assessments, the Population and Human Health assessment methodologies both require this consideration of multiple impacts as a core aspect of the main assessment. The assessment summary tables within Sections 13.9 – effects assessment – Population; and Section 13.13 – outcomes and effects assessment – Human Health are organised on a receptor-by-receptor basis and therefore highlight when intra-Scheme cumulative effects are relevant.

13.16.21. For the population assessment, intra-Scheme cumulative effects within the topic assessment relate to receptors experiencing impacts on access and changes to their key characteristics. Significant residual effects associated with these combinations of impacts are noted as follows:

- **Residents of Uckington** – in construction, changes to key rural characteristics (moderate adverse) and demolition of three residential properties to the south of the A4019 (large adverse).
- **Residents on Stanboro Lane** – in construction, changes to landscape characteristics for residents of Sheldon Cottages (moderate adverse) and the demolition of three properties in the vicinity of Sheldon Nurseries on Stanboro Lane to the north of the A4019 and west of the M5 (large adverse).
- **Residents of Uckington (retained residential properties)**- in operation, impacts on key characteristics of the settlement from demolition of buildings and urbanisation (moderate adverse) and improvements to access for a range of modes for <30 homes at Uckington (moderate beneficial).

13.16.22. In terms of intra-Scheme effects relating to Human Health, the assessment of health outcomes and the associated effects is, by nature, a cumulative effects assessment. The assessment is informed by considering the outcomes and effects of the interaction of multiple impacts on health determinants from the Scheme that affect receptors, drawing on information from air quality, noise, landscape changes and other relevant factors. The human health assessment therefore provides a cumulative assessment of the impacts of the Scheme (both within topic and cross-topic) on the determinants of health outlined in the baseline conditions section of this chapter as an intrinsic part of the main assessment.

13.16.23. On the basis of the above, there are no additional intra-Scheme cumulative effects from the assessment of health outcomes and effects to report in this section. The instances of receptors experiencing multiple impacts from the Scheme resulting in a significant residual effect are as follows:

CONSTRUCTION

- **Wider population (rural context)** - changes to air quality (moderate adverse), noise (moderate adverse), landscape amenity (moderate adverse) and demolition (large adverse).
- **Wider population (urban context)** - changes to landscape amenity (moderate adverse) and demolition (moderate adverse).
- **Families with children and adolescents** - changes to air quality (moderate adverse), safety (moderate adverse), access (moderate adverse, noise (moderate adverse), separation from open space and recreational routes (moderate adverse) and changes in landscape amenity (large adverse).
- **People who are physically disadvantaged** - changes to air quality (moderate adverse), safety (moderate adverse), access (moderate adverse, noise (moderate adverse), separation from open space and recreational routes (moderate adverse) and changes in landscape amenity (large adverse).
- **People who are materially disadvantaged** - changes to safety (moderate adverse), access (moderate adverse) and vocational training opportunities through construction work (moderate beneficial).
- **People from black and minority ethnic groups** - changes to safety (moderate adverse), access (moderate adverse) and vocational training opportunities through construction work (moderate beneficial).
- **Residents of properties at Uckington, Moat Lane and Cooks Lane** - changes to access arrangements (moderate adverse) and changes to landscape amenity (very large adverse).
- **Residents of properties at Homecroft Drive and Appleyard Close (north)** - changes to access arrangements (moderate adverse) and demolition of properties (very large adverse).
- **Residents of properties at Withybridge Gardens, Withybridge Lane and Stanboro Lane** - changes to landscape amenity (very large adverse) and demolition of properties (very large adverse).
- **Users of PRoW and WCH** - changes in access arrangements (moderate adverse); separation from open space and recreational routes (moderate adverse); changes to safety due to the presence of construction works (moderate adverse); and changes to the landscape amenity (large adverse).
- **Employers and employees to businesses adjacent to the A4019** - changes in access arrangements (moderate adverse) and changes in landscape amenity (large adverse).

OPERATION

- **Families with children and adolescents** - access improvements for a range of modes and to community facilities (moderate beneficial in OY and large beneficial in FY) and improvements to safety (moderate beneficial in OY and FY).
- **People who are physically disadvantaged** - access improvements for a range of modes and to community facilities (moderate beneficial in OY and large beneficial in FY) and improvements to safety (moderate beneficial in OY and FY).
- **People who are materially disadvantaged** - access improvements for a range of modes and to community facilities (moderate beneficial in OY and large beneficial in FY) and improvements to safety (moderate beneficial in OY and FY).
- **People from black and minority ethnic groups** - access improvements for a range of modes and to community facilities (moderate beneficial in OY and large beneficial in FY) and improvements to safety (moderate beneficial in OY and FY).

- **Residents of Uckington, Moat Lane and Cooks Lane** - changes in landscape amenity (moderate adverse in FY) and access improvements for a range of modes and to community facilities (large beneficial in OY and very large beneficial in FY).
- **Residents of properties adjacent to the B4634** - Changes in landscape amenity (moderate adverse in FY) and access improvements for a range of modes and to community facilities (moderate beneficial in OY and large beneficial in FY).
- **Residents of properties at Withybridge Gardens, Withybridge Lane and Stanboro Lane** Changes in landscape amenity (moderate adverse in FY) and access improvements for a range of modes and to community facilities (moderate beneficial in OY and large beneficial in FY).
- **Users of PRoW and WCH** - improved safety (large beneficial in OY and FY) and access improvements for a range of modes and to community facilities (large beneficial in OY and very large beneficial in FY).

13.16.24. The further consideration of cross-topic intra-Scheme cumulative effects is reported in Chapter 15 - Cumulative Effects Assessment (Application document TR010063/APP/6.13).

Inter-project cumulative effects assessment (different project impacts) within topic

13.16.25. In terms of inter-project effects, the Population assessment takes into account committed residential and employment developments (i.e. allocations in local plans and developments going through the planning process). This chapter therefore considers the residential and employment reasonably foreseeable future projects (RFFPs) that are identified in Chapter 15 - Cumulative Effects Assessment (~~a~~Application document TR010063/APP/6.13) as a core element of the methodology, drawing on the assumptions that have been made for the purposes of the assessment about their progression relative to the Scheme.

13.16.26. The Human Health assessment considers a future baseline year of 2042 (opening year +15 years) in providing a narrative of potential future health outcomes and the effects that they are associated with. In this respect, developments known to the planning system and the three strategic development sites that are dependent upon transport improvements that will be delivered by the Scheme (the North West Cheltenham Development Area, the West Cheltenham Development area and the safeguarded land to the north-west of Cheltenham) are already taken into consideration. As with the Population assessment, the Human Health assessment has drawn on the assumptions about the RFFPs' progression relative to the Scheme, as set out in Chapter 15 - Cumulative Effects Assessment (Application document TR010063/APP/6.13).

13.16.27. To complete the cumulative effects assessment inter-project 'within topic' element, the Population and Human Health assessments have also been completed with reference to the list of RFFPs that has been developed for the Scheme. The list is based on a review of all developments known to the planning system (which extends beyond the scope of the DMRB LA 112 methodology, which focuses on residential and business development), using the methodology described in Chapter 4 – Environmental Assessment Methodology of the ES (Application document TR010063/APP/6.2).

13.16.28. The RFFP long-list was screened, identifying which RFFPs may result in inter-project cumulative effects in relation to the scope of the Population and Human Health assessments.

13.16.29. The following assumptions/factors were taken into consideration when screening the RFFP list:

- Proximity of the RFFP to the Scheme (i.e. focusing on within 500 m of the Order limits).
- If the RFFP introduced a change in land use (e.g. from greenfield to built development).
- Locations where the size or composition of the population could alter as a result of the proposed development.

- Development that may change the way people move through or use a place (e.g. new destination or new infrastructure).

13.16.30. Table 13-57 lists the RFFPs screened into the Population and Human Health cumulative effects assessment.

Table 13-57 – RFFPs included in the scope of the Population and Human Health assessments

RFFP	Principal reason(s) for inclusion	Application Reference
Either side of M5, north of A4019		
Gloucester Old Spot public house, Tewkesbury Road, Elmstone Hardwicke, Cheltenham, GL51 9SY Extension of existing car park, creation of motorhome parking area and addition of new access point.	Access considerations and increases capacity at a business location already established in the study area.	22/00549/FUL
The Old School House, Stoke Road, Stoke Orchard, Cheltenham Gloucestershire GL52 7RY Erection of a replacement residential property.	Introduces new residents to the community that is within the study area.	20/00003/FUL
Land at Manor Farm, Stoke Road, Stoke Orchard, Cheltenham, Gloucestershire, GL52 7RY Erection of up to nine residential properties.	Introduces new residents to the community that is within the study area.	22/01377/FUL
Knightsbridge Nurseries, Tewkesbury Road, Elmstone, Hardwicke, Cheltenham, GL51 9SY Outline application for up to 46 affordable residential properties with all maters revered except access.	Introduces new residents to the community that is within the study area.	23/00328/OUT
Either side of B4634 Old Gloucester Road		
The Barn, Hayden Lane, Boddington, Cheltenham, Gloucestershire GL51 0SR Prior approval for conversion of agricultural buildings into 1 larger dwellinghouse and associated building operations.	Introduces new residents to the community that is within the study area.	19/00937/PDAD
A & B Buildings At Pilgrove Farm, Pilgrove Farm, Old Gloucester Road, Boddington, Cheltenham, Gloucestershire GL51 0SW Prior approval for conversion of agricultural buildings into 2 larger dwellinghouses and associated building operations.	Introduces new residents to the community that is within the study area.	19/00907/PDAD
Hayden Hill Fruit Farm, Old Gloucester Road, Boddington, Cheltenham, Gloucestershire, GL51 0SW Erection of a replacement residential property following demolition of existing barn and existing bungalow.	Introduces additional space for new residents to the community that is within the study area.	22/00947/FUL
Pilgrove Cottage, Old Gloucester Road, Cheltenham, Gloucestershire, GL51 0SW Proposed development of 4 detached 5-bedroom houses with internal garages, 3 external parking spaces and external landscaping.	Introduces new residents to the community that is within the study area.	22/02172/FUL

RFFP	Principal reason(s) for inclusion	Application Reference
Warners Of Cheltenham, Blaisdon Way, Cheltenham, Gloucestershire, GL51 0WH Erection of 12 business incubator units with flexible B2, B8, E (a) (c) (e) and (g) use.	Introduces new businesses to a location within the study area.	20/02132/FUL
Lansdown Industrial Estate, Gloucester Road, Cheltenham, Gloucestershire Outline application for the redevelopment of the northern part of Lansdown industrial estate for up to 215 residential properties with associated access roads, parking and public open space following the demolition of the existing buildings. All matters reserved except for access. Relates to land allocated under Policy H2 of the Cheltenham Local Plan.	Introduces a substantial change in size of the community (erection of up to 215 residential properties) within the study area.	21/02832/OUT
Either side of A4019		
Pigeon House Farm, The Green, Uckington, Cheltenham, Gloucestershire, GL52 9QB Full application for the removal of an agricultural building and erection of 4 residential properties and associated access.	Introduces new residents to the community that is within the study area.	22/01272/FUL
Uckington Farm, The Green, Uckington, Cheltenham, Gloucestershire, GL51 9SR Demolition of agricultural buildings and erection of 16 residential properties, creation of access, landscaping, and associated works.	Introduces new residents to the community that is within the study area.	22/01163/FUL
Elms Park North West Cheltenham, Off Tewkesbury Road, Uckington Outline application for up to 4115 new homes providing a range and choice of mix and tenure**.** **Relating to land allocated under Policy A4 – North West Cheltenham Development Area.**	Introduces a substantial change to the size of the community (4115 new homes) and residents. Will generate new requirement for services and facilities. *Note this is partly dependent on the transport infrastructure improvements, which will be delivered by the Scheme, in accordance with Policy A4 of the JCS.*	16/02000/OUT (Policy A4 of the JCS)
Swindon Farm, Tewkesbury Road, Cheltenham, Gloucestershire Demolition of a residential property and erection of 266 residential property, new vehicular and pedestrian access off Manor Road, attenuation basin and ancillary infrastructure **Relating to part of the land allocated under Policy A4 – North West Cheltenham Development Area.**	Introduces new residents to the community that is within the study area.	20/00759/FUL (Policy A4 of the JCS)

RFFP	Principal reason(s) for inclusion	Application Reference
Home Farm, Quat Goose Lane, Cheltenham, GL51 9RP Outline application for the erection of up to 180 residential units, including provision of vehicular and pedestrian access, green infrastructure**,** and associated works. Appearance, landscaping, layout**,** and scale are matters reserved for future consideration. **Relating to part of the land allocated under Policy A4 – North West Cheltenham Development Area.**	Introduces new residents to the community that is within the study area.	23/00354/OUT
Gallagher Retail Park, Tewkesbury Road, Uckington, Cheltenham, Gloucestershire, GL51 9RR Erection of Class A1 retail unit (929 sqm) at ground floor with full cover mezzanine, car parking, servicing, drainage**,** and access reconfiguration.	Introduces a change to businesses close to the Scheme and within the study area.	17/01459/FUL 17/00827/FUL
Carpetright Plc Unit M Gallagher Retail Park, Tewkesbury Road, Cheltenham Gloucestershire GL51 9RR Change of use from Class A1 (retail) to Class D2 (leisure and assembly) to create a gym.	Introduces a change to businesses close to the Scheme and within the study area. The use proposed would also represent a community facility.	19/00113/COU
Land North West Manor Road, Runnings Road, Cheltenham, Gloucestershire Outline application for the construction of light industrial units includes a new access. All other matters reserved.	Introduces a change to businesses close to the Scheme and within the study area.	19/01260/OUT
Gallagher Retail Park, Tewkesbury Road, Cheltenham, Gloucestershire Erection of a restaurant unit with driver-thru lane and association car parking, layout**,** and landscaping amendments.	Introduces a change to businesses close to the Scheme and within the study area.	21/02120/FUL
Land Known as Evergreen Spiritual Pathways, The Green, Uckington, Cheltenham, Gloucestershire GL51 9SS Permission in principle application for the erection of up to 3 residential properties.	Introduces new residents to the community that is within the study area.	22/00164/PIP
Douglas Equipment, Village Road, Cheltenham, Gloucestershire, GL51 0AB Demolition of existing buildings and erection of 71 d, including access, car paring, landscaping**,** and associated works.	Introduces a substantial change in size of the community (erection of 71 residential properties) within the study area.	22/00474/FUL
Safeguarded land to the north-west of Cheltenham Land safeguarded for longer term development needs. Anticipated to be a future residential led mixed use development within the JCS. An approximate total of 2000 homes is assumed, pending receipt of any associated applications.	May introduce a substantial change to the size of the community (2000 new homes assumed) and residents, as well as new businesses close to the Scheme and within the	JCS policy SD5

RFFP	Principal reason(s) for inclusion	Application Reference
	study area. Will generate new requirement for services and facilities. *Note this is partly dependent on transport improvements that will be delivered by the Scheme, in accordance with the JCS.*	
Outline application for residential development comprising a mixture of market and affordable housing (use class C3), which could include retirement/extra care accommodation (use class C2/C3) a flexible mixed use area with a community hub (including potentially use classes E, F1 and F2) a primary school and children's nursery to include use of sports pitches to provide public recreation space, site clearance and preparation, green infrastructure, walking and cycling routes, formal and informal public open space, sports pitch provision, drainage and other associated works and infrastructure, including utilities and highways works, all matters reserved except partially for access. Relating to land allocated under Policy A7 – West Cheltenham Development Area. Allocated site (connected to the Cyber Park). JCS Policy A7 cites: Land allocation for future residential led mixed-use development within the JCS. 1,100 new homes and 45 ha. of business uses, focused on community facilities and retail.	Introduces a substantial change to the size of the community (1,100 new homes) and residents, as well as new businesses (45 ha. of business uses to include new community facilities) close to the Scheme and within the study area. *Note this is partly dependent on the transport infrastructure improvements that will be delivered by the Scheme, in accordance with the JCS Policy A7.*	22/01817/OUT and 22/01107/OUT (Policy A7 of the JCS)
Phase 1 land at Old Gloucester Road. **Various successive applications for approval of reserved matters (access, appearance, landscaping, layout, and scale) pursuant to outline planning permissions ref. 17/01411/OUT for residential development of up to 90 residential properties, associated open space, landscaping and infrastructure, including new vehicular access to Old Gloucester Road (revised application following grant of 20/00272/REM).** **The revised proposals are for 85 residential properties.** Relates to a parcel of land within HD8 – Strategic Site– land to the north of the B4634 , which is a Cheltenham Plan site allocation for 175 homes (11.3 ha.)	May introduce new residents and a change to businesses close to the Scheme and within the study area. Introduces a substantial change to the size of the community (175 new homes) and residents. Will generate new requirement for services and facilities.	21/00872/REM (Cheltenham Plan Policy HD8)

Summary of cumulative inter-project effects of the Scheme on RFFPs

13.16.31. For the majority of the shortlisted RFFPs, the assessment of the potential for the Scheme to exert a cumulative impact upon them has been assessed as comparable to the effects and health outcomes identified for those receptor clusters to which they would relate. This conclusion relates to the RFFPs that are typically small in scale (i.e. less than 10 residential properties or below 1ha. for non-residential development) and are proposed within a previously developed location, or are slightly larger in scale but within a cluster identified as having low sensitivity to change. On this basis, no potential for significant residual cumulative inter-project effects from the Scheme has been identified in relation to the following RFFPs:

- 22/00549/FUL – Gloucester Old Spot public house.
- 20/00003/FUL – The Old School House.
- 22/01377/FUL – land at Manor Farm.
- 23/00328/OUT – Knightsbridge Nurseries.
- 19/00937/PDAD – The Barn, Hayden Lane.
- 19/00907/PDAD – A&B Buildings at Pilgrove Farm.
- 22/00947/FUL – Hayden Hill Fruit Farm.
- 22/02172/FUL – Pilgrove Cottage.
- 20/02132/FUL – Warners of Cheltenham.
- 21/02832/OUT – Lansdown Industrial Estate.
- 22/01272/FUL – Pigeon House Farm.
- 22/01163/FUL – Uckington Farm.
- 23/00354/OUT – Home Farm.
- 17/01459/FUL and 17/00827/FUL – Gallagher Retail Park.
- 19/00113/COU – Gallagher Retail Park.
- 19/01260/OUT – Land North West Manor Road.
- 21/02120/FUL – Gallagher Retail Park.
- 22/00164/PIP – Land known as Evergreen Spiritual Pathways.
- 22/00474/FUL – Douglas Equipment.

13.16.32. There are five exceptions to the above conclusions, as listed below then described to follow.

- 16/02000/OUT (Elms Park) – relating to land allocated under Policy A4 – North West Cheltenham Development Area.
- 20/00759/FUL – (Swindon Farm) relating to part of the land allocated under Policy A4 – North West Cheltenham Development Area.
- Safeguarded land to the north-west of Cheltenham (Policy SD5).
- 22/01817/OUT and 22/01107/OUT– relating to part of the land allocated under Policy A7 – West Cheltenham Development Area.
- 21/00872/REM – relating to part of the land allocated under Cheltenham Local Plan Policy HD8 – Strategic Site – land to the north of B4634.

16/02000/OUT and Policy A4 – Elms Park (North West Cheltenham Development Area)

13.16.33. This RFFP is one of three strategic sites that require transport improvements, which are to be delivered by the Scheme, in order to progress to full implementation. The design of the Scheme has therefore already accounted for anticipated trip generation from the RFFP (i.e. the number of homes proposed) in traffic modelling through consideration of typical flows along the ARN for the Scheme. The design of the Scheme also includes vehicular access points into the development parcel within the relevant junction designs; and WCH crossing provision has been incorporated within the Scheme design at this junction, in anticipation of future use by vehicles. On this basis, the Scheme has the

potential to benefit the RFFP in terms of improving multi-modal access, both to support construction and once the RFFP is in operation (as reported in the Population assessment findings and noted as part of a positive health outcome).

13.16.34. The CEA assumptions are that because the development is dependent upon the transport infrastructure improvements that will be delivered by the Scheme, construction overlap may be anticipated in terms of enabling works and some infrastructure works, but that no residential receptors will be present until the Scheme is operational. On this basis, there is no potential for the Scheme construction works to affect prospective residents of this RFFP (it is important to note that application 20/00759/FUL also relates to land within the North West Cheltenham Development Area – this is further progressed through the planning system and different assumptions apply – see relevant section below).

13.16.35. Impacts of the operational Scheme on prospective residents of the RFFP would be comparable to the general conclusions drawn in relation to residents of north-west Cheltenham – **large beneficial residual effects** on access, which are significant (as reported in the Population assessment findings and noted as part of a positive health outcome).

13.16.36. The impact of the RFFP and the Scheme acting together on other receptors within the study area is considered within the inter-project cross-topic Chapter 15 - Cumulative Effects Assessment (Application document TR010063/APP/6.13).

20/00759/FUL – Swindon Farm (part of North West Cheltenham Development Area, Policy A4)

13.16.37. This RFFP relates to land within a larger parcel forming one of three strategic sites that require transport improvements, which are to be delivered by the Scheme, in order to progress to full implementation. The design of the Scheme has therefore already accounted for anticipated trip generation from the RFFP (i.e. the number of homes proposed) in traffic modelling through consideration of typical flows along the ARN for the Scheme. The design of the Scheme also includes a vehicular access point into the access road serving the Application Site within the junction design; and WCH crossing provision has been incorporated within the Scheme design at this junction, in anticipation of future use by vehicles. On this basis, the Scheme has the potential to benefit the RFFP in terms of improving multi-modal access, both to support construction and once the RFFP is in operation (as reported in the Population assessment findings and noted as part of a positive health outcome).

13.16.38. The CEA assumptions are that because the development is dependent upon the transport infrastructure improvements that will be delivered by the Scheme, construction overlap may be anticipated in terms of enabling works, some infrastructure works and the start of home construction. It is noted in the assumptions for assessment that up to 25% of homes may be occupied at the start of Scheme construction, rising to up to 75% of homes once the Scheme is operational. On this basis, there is potential for the Scheme construction works to affect prospective residents; however, it is considered than any prospective residents would be well informed about the nature and planned duration of construction for both the Scheme and the RFFP on choosing to take occupation and thus their sensitivity to change must be assumed to be lower than that of existing residents in this part of the study area. No significant construction effects on Population or Human Health from the Scheme are identified in relation to incoming residents making this choice consciously.

13.16.39. Impacts of the operational Scheme on prospective residents of the RFFP would be comparable to the general conclusions drawn in relation to residents of north-west Cheltenham – **large beneficial residual effects** on access, which are significant (as reported in the Population assessment findings and noted as part of a positive health outcome).

13.16.40. The impact of the RFFP and the Scheme acting together on other receptors within the study area is considered within the inter-project cross-topic Chapter 15 - Cumulative Effects Assessment (Application document TR010063/APP/6.13).

Safeguarded land to the north-west of Cheltenham (Policy SD5)

13.16.41. This RFFP is one of three strategic sites that require transport improvements, which are to be delivered by the Scheme, in order to progress to full implementation. The design of the Scheme has therefore already accounted for anticipated trip generation from the RFFP (i.e. the number of homes proposed) in traffic modelling through consideration of typical flows along the ARN for the Scheme. The design of the Scheme also includes a vehicular access point into the development parcel within the junction design; and WCH crossing provision has been incorporated within the Scheme design at this junction, in anticipation of future use by vehicles. On this basis, the Scheme has the potential to benefit the RFFP in terms of improving multi-modal access, both to support construction and once the RFFP is in operation (as reported in the Population assessment findings and noted as part of a positive health outcome).

13.16.42. The CEA assumptions are that because the development is dependent upon the transport infrastructure improvements that will be delivered by the Scheme, construction overlap may be anticipated in terms of enabling works and some infrastructure works, but that no residential receptors will be present until the Scheme is operational. On this basis, there is no potential for the Scheme construction works to affect prospective residents.

13.16.43. Impacts of the operational Scheme on prospective residents of the RFFP would be comparable to the general conclusions drawn in relation to residents of north-west Cheltenham – **large beneficial residual effects** on access, which are significant (as reported in the Population assessment findings and noted as part of a positive health outcome).

13.16.44. The impact of the RFFP and the Scheme acting together on other receptors within the study area is considered within the inter-project cross-topic Chapter 15 - Cumulative Effects Assessment (Application document TR010063/APP/6.13).

22/01817/OUT and 22/01107/OUT West Cheltenham Development Area (Policy A7)

13.16.45. This RFFP relates to land within a larger parcel forming one of three strategic sites that require transport improvements, which are to be delivered by the Scheme, in order to progress to full implementation. The design of the Scheme has therefore already accounted for anticipated trip generation from the RFFP (i.e. the number of homes proposed) in traffic modelling through consideration of typical flows along the ARN for the Scheme. The design of the Scheme also includes a vehicular access point into the access road serving the development parcel within the junction design on the B4634; and WCH crossing provision has been incorporated within the Scheme design at this junction, in anticipation of future use by vehicles. On this basis, the Scheme has the potential to benefit the RFFP in terms of improving multi-modal access, both to support construction and once the RFFP is in operation (as reported in the Population assessment findings and noted as part of a positive health outcome).

13.16.46. The CEA assumptions are that because the development is dependent upon the transport infrastructure improvements that will be delivered by the Scheme, construction overlap may be anticipated in terms of enabling works and some infrastructure works, but that no residential receptors will be present until the Scheme is operational. On this basis, there is no potential for the Scheme construction works to affect prospective residents.

13.16.47. Impacts of the operational Scheme on prospective residents of the RFFP would be comparable to the general conclusions drawn in relation to residents towards the south-western parts of the study area – **moderate beneficial residual effects** on access, which are significant (as reported in the Population assessment findings and noted as part of a positive health outcome).

13.16.48. The impact of the RFFP and the Scheme acting together on other receptors within the study area is considered within the inter-project cross-topic Chapter 15 - Cumulative Effects Assessment (Application document TR010063/APP/6.13).

21/00872/REM – relating to part of the land allocated under Cheltenham Local Plan Policy HD8– land to the north of the B4634

13.16.49. This RFFP is a site allocated within the adopted Cheltenham Plan – it would have been evaluated by the CBC planning policy officers during the Plan preparation in the context that the JCS proposed the Scheme to enhance the strategic transport network in the vicinity of the RFFP. On this basis, the Scheme has the potential to benefit the RFFP in terms of improving multi-modal access in this part of Cheltenham, both to support construction and once the RFFP is in operation (as reported in the Population assessment findings and noted as part of a positive health outcome).

13.16.50. The CEA assumptions are that because the RFFP is linked to a planning application that has progressed beyond approval of reserved matters through to discharging conditions, and that there is a two-year expiration within the consent, there will be construction overlap with the Scheme. On this basis, there is potential for the Scheme construction works to interact with the RFFP, with the assumption that 50% of the homes will be complete by the time the Scheme is operational – this equates to 43 homes.

13.16.51. It is considered than any prospective residents would be well informed about the nature and planned duration of construction for both the Scheme and the RFFP on choosing to take occupation and thus their sensitivity to change must be assumed to be lower than that of existing residents in this part of the study area. The RFFP is beyond the 300m threshold from Order Limits that is used to identify significant disturbance effects and no significant landscape effects of the Scheme are anticipated in this location and this part of the B4634 is not anticipated to be a preferred route for Scheme construction traffic. Consequently, no significant construction effects on Population or Human Health from the Scheme are identified in relation to incoming residents choosing to occupy homes in the Scheme construction phase.

13.16.52. Impacts of the operational Scheme on prospective residents of the RFFP who take occupation during the construction phase (and would therefore experience the change to the operational phase) would be comparable to the general conclusions drawn in the population assessment. However, the CEA assumptions indicate that 50% of the homes will come into occupation once the Scheme is operational. Consequently, the overall conclusion is a minor ~~relation to residents of north-west Cheltenham – large~~ beneficial residual effect~~s~~ on access, which ~~are~~ is not significant (~~as reported in the Population assessment findings and noted as part of~~ also a positive health outcome).

13.16.53. The impact of the RFFP and the Scheme acting together on other receptors within the study area is considered within the inter-project cross-topic Chapter 15 - Cumulative Effects Assessment (Application document TR010063/APP/6.13).

Potential Cumulative Inter-project Effects of RFFPs on the Scheme

13.16.54. For the majority of the shortlisted RFFPs, the assessment of the potential for the RFFP to exert a cumulative impact upon the Scheme of sufficient magnitude to equate to a significant effect has been scoped out. Typically, this is because the RFFPs are of a sufficiently small scale (i.e. less than 10 residential properties or below 1ha. for non-residential development) that they would not generate notable additional trips in construction or operation and/or they are proposed within a previously developed location that is already served by an established transport network. In some instances, RFFPs have the potential to generate new destinations (e.g. businesses, retail or community facilities) that would serve residents of the study area; however, these are not considered to be sufficiently large in scale to interact with the Scheme to generate significant cumulative effects. On this basis, no potential for significant residual cumulative inter-project effects upon the Scheme has been identified in relation to the following RFFPs:

- 22/00549/FUL - Gloucester Old Spot public house.
- 20/00003/FUL - The Old School House.
- 22/01377/FUL - land at Manor Farm.
- 23/00328/OUT - Knightsbridge Nurseries.
- 19/00937/PDAD - The Barn, Hayden Lane.

- 19/00907/PDAD - A&B Buildings at Pilgrove Farm.
- 22/00947/FUL - Hayden Hill Fruit Farm.
- 22/02172/FUL - Pilgrove Cottage.
- 20/02132/FUL - Warners of Cheltenham.
- 21/02832/OUT - Lansdown Industrial Estate.
- 22/01272/FUL - Pigeon House Farm.
- 22/01163/FUL - Uckington Farm.
- 23/00354/OUT - Home Farm.
- 17/01459/FUL and 17/00827/FUL - Gallagher Retail Park.
- 19/00113/COU - Gallagher Retail Park.
- 19/01260/OUT - Land North West Manor Road.
- 21/02120/FUL - Gallagher Retail Park.
- 22/00164/PIP - Land known as Evergreen Spiritual Pathways.
- 22/00474/FUL - Douglas Equipment.

13.16.55. There are five exceptions to the above conclusions as listed below then described to follow.

- 16/02000/OUT (Elms Park) – relating to land allocated under Policy A4 – North West Cheltenham Development Area.
- 20/00759/FUL (Swindon Farm) – relating to part of the land allocated under Policy A4 Elms Park (part of North West Cheltenham Development Area).
- Safeguarded land to the north-west of Cheltenham (Policy SD5).
- 22/01817/OUT and 22/01107/OUT – relating to part of the land allocated under Policy A7 – West Cheltenham Development Area.
- 21/00872/REM Phase 1 Land at Old Gloucester Road – relating to part of the land allocated under Policy HD8 – Strategic Site – land to the north of Old Gloucester Road.

16/02000/OUT and Policy A4 – Elms Park (North West Cheltenham Development Area)

13.16.56. This RFFP is one of three strategic sites that require transport improvements, which are to be delivered by the Scheme, in order to progress to full implementation. The CEA assumptions are that because the development is dependent upon the transport infrastructure improvements that will be delivered by the Scheme, construction overlap may be anticipated in terms of enabling works and some infrastructure works, but that no residential receptors will be present until the Scheme is operational.

13.16.57. There is potential for construction impacts of the Scheme to interact with those of the early construction stages of the RFFP to generate additive cumulative adverse effects upon nearby residential receptors. This is most likely to be relevant to residents of Uckington and Homecroft Drive and is anticipated to manifest as disruptions to access and reductions in amenity – this results in effects on Population, as well as contributing to negative health outcomes for existing residents. Disruptions to access at Gallagher Retail Park may also be exacerbated by works to the Gallagher Retail Park junction and Manor Road junction due to the Scheme and RFFP combined, resulting in an additional receptor cluster – business and community facilities at Gallagher Retail Park and their user groups – also experiencing additive adverse cumulative effects.

13.16.58. The RFFP is to the north and east of Uckington, so it will form a potential additional source of construction related noise and visual intrusion (to the Scheme). The access route for the RFFP will be along the A4019 and then Manor Road, meaning it will cross the Order limits adding to traffic that will need to be managed within the Scheme construction. **The additive cumulative inter-project effects of the RFFP on the Scheme, due to the impacts above, are assessed as moderate adverse and significant in the**

construction phase, affecting residents at Uckington and Homecroft Drive and staff and users of business and community facilities within Gallagher Retail Park.

13.16.59. The potential health outcomes arising from the additional residents associated with this RFFP are considered within the Human Health assessment. No additional operational cumulative inter-project effects are predicted from this RFFP in relation to Human Health.

13.16.60. The impact of the RFFP and the Scheme acting together on other receptors within the study area is considered within the inter-project cross-topic Chapter 15 - Cumulative Effects Assessment (Application document TR010063/APP/6.13).

20/00759/FUL – Swindon Farm (part of North West Cheltenham Development Area – Policy A4)

13.16.61. This RFFP relates to part of a larger parcel of land that is one of three strategic sites that require transport improvements, which are to be delivered by the Scheme, in order to progress to full implementation. The CEA assumptions are that because the development is dependent upon the transport infrastructure improvements that will be delivered by the Scheme, construction overlap may be anticipated in terms of enabling works, some infrastructure works and the start of home construction. It is noted in the assumptions for assessment that up to 25% of homes may be occupied at the start of Scheme construction, rising to up to 75% of homes once the Scheme is operational.

13.16.62. There is potential for construction impacts of the Scheme to interact with those of the construction stages of the RFFP to generate additive cumulative adverse effects upon nearby residential receptors. This is most likely to be relevant to residents of Uckington and along the A4019 east of Uckington and is anticipated to manifest as disruptions to access and reductions in amenity – this results in effects on Population, as well as contributing to negative health outcomes for existing residents. Disruptions to access at Gallagher Retail Park may also be exacerbated by works to Manor Road due to the Scheme and RFFP combined, resulting in an additional receptor cluster – business and community facilities at Gallagher Retail Park and their user groups – also experiencing additive adverse cumulative effects.

13.16.63. The RFFP is to the north- east of Uckington, so it will form a potential additional source of construction related noise and visual intrusion (to the Scheme). The access route for the RFFP will be along the A4019 and then Manor Road, meaning it will cross the Order limits adding to traffic that will need to be managed within the Scheme construction. **The additive cumulative inter-project effects of the RFFP on the Scheme, due to the impacts above, are assessed as moderate adverse and significant in the construction phase, affecting residents at Uckington and along the A4019 east of Uckington and staff and users of business and community facilities within Gallagher Retail Park**.

13.16.64. The potential health outcomes arising from the additional residents associated with this RFFP are considered within the Human Health assessment. No additional operational cumulative inter-project effects are predicted from this RFFP in relation to Human Health.

13.16.65. The impact of the RFFP and the Scheme acting together on other receptors within the study area is considered within the inter-project cross-topic Chapter 15 - Cumulative Effects Assessment (Application document TR010063/APP/6.13).

Safeguarded land to the north-west of Cheltenham (Policy SD5)

13.16.66. This RFFP is one of three strategic sites that require transport improvements, which are to be delivered by the Scheme, in order to progress to full implementation. The CEA assumptions are that because the development is dependent upon the transport infrastructure improvements that will be delivered by the Scheme and that there is not yet any associated planning application, construction overlap may be anticipated in terms of enabling works and some infrastructure works, but that no residential receptors will be present until the Scheme is operational.

13.16.67. There is potential for construction impacts of the Scheme to interact with those of the early construction stages of the RFFP to generate additive cumulative adverse effects upon

nearby residential receptors. This is most likely to be relevant to residents of Uckington and the A4019 between M5 Junction 10 and Uckington and is anticipated to manifest as disruptions to access and reductions in amenity – this results in effects on Population, as well as contributing to negative health outcomes for existing residents. The RFFP is to the west of Uckington and north of the A4019, so it will form a potential additional source of construction related noise and visual intrusion (to the Scheme). The access route for the RFFP will be along the A4019, meaning it will cross Order limits, adding to traffic that will need to be managed within the Scheme. The additive cumulative inter-project effects of the RFFP on the Scheme, due to the impacts above, are assessed as moderate adverse and significant in the construction phase, affecting residents at Uckington and the A4019 between M5 Junction 10 and Uckington.

13.16.68. The informal Traveller site adjacent to the M5 is within the curtilage of the land to the north-west of Cheltenham and it is assumed that any impacts from the RFFP will be direct land take and therefore of a greater magnitude than those that would be experienced from the Scheme. This is not reflected as a cumulative effect, but rather is considered as a direct RFFP impact.

13.16.69. The Scheme includes an underpass beneath the A4019 to the east of M5 Junction 10. This is intended to connect to the bridleway AUC1 and wider footpath network that exists within the land to which the RFFP relates. The RFFP therefore has the potential to interact with WCH user group receptors, which themselves are anticipated to increase in number once the Scheme is operational due to the enhanced connectivity of the recreational network through the study area. This represents a potentially significant cumulative inter-project effect – dependent upon the RFFP design and proposals for managing construction (which are not currently known), the resultant effects of this interaction could be beneficial or adverse. **Due to the uncertainty, it is assessed on a precautionary basis (as there is limited information about the RFFP) as moderate adverse and significant in the construction phase.** It would be desirable to seek to ensure that the RFFP design is developed in a manner that would maintain the integrity and benefit the user experience associated with this part of the recreational WCH network.

13.16.70. The potential access, community characteristics impacts and health outcomes arising from the additional residents associated with this RFFP are considered within the Human Health assessment. No additional operational cumulative inter-project effects are predicted from this RFFP in relation to Human Health.

13.16.71. The impact of the RFFP and the Scheme acting together on other receptors within the study area is considered within the inter-project cross-topic Chapter 15 - Cumulative Effects Assessment (Application document TR010063/APP/6.13).

22/01817/OUT and 22/01107/OUT West Cheltenham Development Area (Policy A7)

13.16.72. This RFFP relates to part of a larger parcel of land that is one of three strategic sites that require transport improvements, which are to be delivered by the Scheme, in order to progress to full implementation. The CEA assumptions are that because the development is dependent upon the transport infrastructure improvements that will be delivered by the Scheme, construction overlap may be anticipated in terms of enabling works and some infrastructure works, but that no residential receptors will be present until the Scheme is operational.

13.16.73. There is potential for construction impacts of the Scheme to interact with those of the early construction stages of the RFFP to generate additive cumulative adverse effects upon nearby residential receptors. This is most likely to be relevant to residents along the B4634 close to the proposed Link Road junction, as well as staff and users of the House in the Tree pub and is anticipated to manifest as disruptions to access and reductions in amenity – this results in effects on Population, as well as contributing to negative health outcomes for existing residents.

13.16.74. The RFFP is to the south of the Order limits, south of the B4634, so it will form a potential additional source of construction related noise and visual intrusion (to the Scheme). If the development were to proceed as per the 22/01817/OUT and 22/01107/OUT application plans, the access route for the RFFP in construction will be along the A4019 and then

Withybridge Lane, meaning traffic will cross the Order limits adding to traffic that will need to be managed within the Scheme construction. The Applicant is seeking for the Scheme developers and the RFFP developers to coordinate construction activities, works sequencing and approaches to community engagement to reduce cumulative effects. On the basis that the JCS policy requires substantive infrastructure improvements in place before development proceeds, the sequencing assumptions made for the purposes of the CEA (~~a~~Application document TR010063/APP/6.13) are that there will be no receptors present during Scheme construction. **The additive cumulative inter-project effects of the RFFP on the Scheme, due to the impacts above and the assumptions made for CEA, are assessed on a precautionary basis (as there is limited certainty about the RFFP) as moderate adverse and significant in the construction phase, affecting residents of the B4634 close to the proposed Link Road junction and Withybridge Lane as well as staff and users of the House in the Tree pub**.

13.16.75. The RFFP also includes proposals for a flexible mixed-use area with a community hub, primary school, children's nursery, sports pitches, and recreation space including walking and cycling routes. These have the potential to combine with the access benefits of the Scheme as additive cumulative beneficial effects, offering existing and incoming residents of the study area improved availability and accessibility of facilities and services that support healthier lifestyle choices, mental and physical well-being. The potential health outcomes arising from the additional residents and new land uses associated with this RFFP are considered within the Human Health assessment. No additional operational cumulative inter-project effects are predicted from this RFFP in relation to Human Health.

13.16.76. The impact of the RFFP and the Scheme acting together on other receptors within the study area is considered within the inter-project cross-topic Chapter 15 - Cumulative Effects Assessment (Application document TR010063/APP/6.13).

21/00872/REM – relating to part of the land allocated under Cheltenham Local Plan Policy HD8– land to the north of Old Gloucester Road

13.16.77. This RFFP is a site allocated within the adopted Cheltenham Plan – it would have been evaluated by the CBC planning policy officers during the Plan preparation in the context that the JCS proposed the Scheme to enhance the strategic transport network in the vicinity of the RFFP.

13.16.78. The CEA assumptions are that because the RFFP is linked to a planning application that has progressed beyond approval of reserved matters through to discharging conditions, and that there is a two-year expiration within the consent, there will be construction overlap with the Scheme. On this basis, there is potential for the Scheme construction works to interact with the RFFP, with the assumption that 50% of the homes will be complete by the time the Scheme is operational - this equates to 43 homes.

13.16.79. There is potential for construction impacts of the Scheme to interact with those of the early construction stages of the RFFP to generate additive cumulative adverse effects upon nearby residential receptors. This is most likely to be relevant to residents along the B4634 close to the A4019 junction. However, this section of the study area road network is not anticipated to be a key route for Scheme construction traffic and this part of the study area is outside the construction noise disturbance threshold distance of 300m from Order limits. Based on the assumptions made for the CEA and these characteristics of the RFFP relative to the Scheme, there is no potential for construction impacts of the Scheme to interact with those of the RFFP to generate significant cumulative effects.

13.16.80. The potential health outcomes arising from the additional residents associated with this RFFP are considered within the Human Health assessment. No additional operational cumulative inter-project effects are predicted from this RFFP in relation to Human Health.

13.16.81. The impact of the RFFP and the Scheme acting together on other receptors within the study area is considered within the inter-project cross-topic Chapter 15 - Cumulative Effects Assessment (Application document TR010063/APP/6.13).

13.17. Assumptions and limitations

13.17.1. It has been assumed during the assessment that the Scheme description detailed within Chapter 2 - The Scheme (Application document TR010063/APP/6.2), will be constructed. This has taken into account the lateral and vertical limits of deviation defined on the Works Plans (~~a~~Application document TR010063/APP/2.4) in order to establish a realistic worst-case assessment scenario, taking into account the potential for the Scheme to have an impact on Population (WCH, residential and commercial properties, community facilities and agricultural land holdings) and Human Health through the construction and operation of the Scheme.

13.17.2. It is also anticipated that, notwithstanding any potential deviation, all population and human health mitigation measures embedded in the design of the Scheme would still be deliverable within the limits of deviation (refer to Chapter 2 - The Scheme (Application document TR010063/APP/ 6.2)) and would still fulfil their intended function.

13.17.3. The Scheme's temporary and permanent footprints have been identified through the preliminary design, consultation and through engagement with landowners that would be affected by its progression. These are defined by the Order limits within the DCO application and are illustrated on the General Arrangement Plans (Application document TR010063/APP/2.9).

13.17.4. The Applicant is endeavouring to acquire land by agreement, however, the necessary rights to gain the land required to deliver the Scheme are being sought by the Applicant through the DCO application and accompanying compulsory purchase process, to ensure that the Scheme can be delivered effectively.

13.17.5. It is to be noted that much of the public health information available is based on Census 2011 results. A new Census has been carried out in 2021 however results for relevant datasets at the appropriate ward level are not yet available. It is considered that this information is still relevant, and consideration was also made of more up to date strategies and health and wellbeing information, where available.

13.17.6. The search for planning applications and development land provides a snapshot of the key planning developments close to the Scheme. This has been updated periodically (November 2022 was the latest full review, with the status of applications for strategic sites within the JCS reviewed in January 2023), including as close to the submission of the DCO application for the Scheme as practicable.

13.17.7. The assessment is principally desk-based, with assessment findings formed based on the judgement of suitably qualified and experienced professionals, supplemented by knowledge gained on previous highway schemes. Where practicable, assessment assumptions and findings have been informed by consultation, which adds a level of confidence to the description of the baseline and the nature of effects that are likely to arise from the reported Scheme impacts.

13.17.8. The impact of COVID-19 on public health and wellbeing is still uncertain and will remain so for some time.

13.17.9. Whilst it has been possible to identify changes to some of the determinants of health likely to arise from the Scheme, health outcomes are dependent on multiple factors, some of which rest with individuals and/or outside the powers or influence of physical infrastructure and/or planning decisions. Identifying health outcomes of the Scheme and their contributing factors is therefore a qualitative exercise. The findings are based upon a desk-based study of the area, along with professional judgement and knowledge based on previous similar schemes, plus some targeted consultation. Information, where relevant, is also used from other specialist topic assessments to help to assess the magnitude of impact of the Scheme on receptors.

13.17.10. The assessment methodology for Population and Human Health is by nature a cumulative assessment that considers the combined effects of a number of different environmental impacts of the Scheme. Therefore, there will be a degree of overlap between this chapter and some other technical chapters, including Air Quality, Noise & Vibration, Landscape and Road Drainage and the Water Environment. However, due to the different receptors

that the inherently cumulative effects are being assessed against, the assessment findings may differ between the Population and Human Health assessment and those contributing technical assessments.

13.17.11. The Scheme's temporary and permanent land take requirements have been identified through the preliminary design, consultation and through engagement with landowners that would be affected by its progression. These are defined by the Order limits within the DCO application and are illustrated on the General Arrangement Plans (Application document TR010063/APP/2.9). For the Scheme approximately 54.1 ha of land would be acquired permanently, 39.1 ha would be subject to temporary possession with use of land and 41.7 ha would be used temporarily and rights over land are to be permanently required.

13.17.12. Although the Applicant is endeavouring to acquire land by agreement, the necessary rights to gain the land required to deliver the Scheme are being sought by the Applicant through the DCO application and accompanying compulsory purchase process, to ensure that the Scheme can be delivered effectively.

13.18. Chapter summary

Population assessment

13.18.1. An assessment of the construction and operational impacts of the Scheme on the following Population topics has been undertaken:

- Private property and housing.
- Community land and assets.
- Development land and businesses.
- Agricultural land holdings.
- Walkers, cyclists, and horse riders.

13.18.2. The assessment has identified the impacts to these topics that have the potential to result in significant effects once approaches to avoiding, lessening, or mitigating effects have been taken into account. The summary assumes that both embedded and essential mitigation measures are fully implemented, resulting in the identification of potentially significant residual effects. The results are summarised in Table 13-58.

13.18.3. A precautionary approach has been adopted, allowing for uncertainty about the implementation of essential mitigation (for example, where it relies upon the PC, third parties or responding to further targeted engagement). Where appropriate, the assessment includes a commentary to signpost how magnitudes of impacts may reduce, depending on the detail of the implementation of essential mitigation – this is provided within Section 13.9 of this chapter and is not repeated here.

13.18.4. The impacts on agricultural holdings occur in the construction phase. For the purpose of the population assessment, these are reported in the construction phase only.

13.18.5. The impacts on the WCH network occur in the construction phase. The Scheme design reinstates routes along different alignments, and these are realised within the construction phase. There are therefore no identified significant residual effects relating to WCH for the Scheme, for the operational phase.

13.18.6. The population assessment focuses on changes to journey length for WCH routes only. Aspects of the Scheme design that introduce new WCH assets and their attendant impacts are addressed within the Human Health assessment.

Table 13-58 – Summary of significant residual effects – Population assessment

Receptor	Significant residual effect	Summary description
Private property and housing – construction		

Receptor	Significant residual effect	Summary description
Three residential properties in the vicinity of Sheldon Nurseries on Stanboro Lane to the north of the A4019 and west of the M5.	Large adverse construction	Demolition
All fourteen residential properties at Withybridge Gardens plus associated garages and garden outbuildings.	Large adverse construction	Demolition
Two residential properties at Withy Bridge, to the north of the A4019 near Withybridge Lane, plus associated garages and outbuildings.	Large adverse construction	Demolition
Three residential properties at Uckington, to the south of the A4019.	Large adverse construction	Demolition
Ten residential properties (comprising five semi-detached buildings) to the east of West Cheltenham Fire Station.	Large adverse construction	Demolition
Residents of the community of Uckington.	Moderate adverse construction	Changes to key rural characteristics from construction works, demolition of buildings and the introduction of urbanising features along the A4019 corridor
Residents of the informal Traveller site to the north of the M5 Junction 10 and adjacent to the M5 corridor.	Moderate adverse construction	Changes to key characteristics arising from land take and loss of vegetation that provides screening (acoustic and visual) and enclosure to the western edge of the site
Residents of Sheldon Cottages, which comprises two semi-detached residential properties accessed from Stanboro Lane to the north-west of M5 Junction 10.	Moderate adverse construction	Changes to the characteristics from construction works, demolition of adjacent buildings, the works to reconfigure ~~reconfiguration of~~ the access and form~~ation of~~ earthworks
Incoming residents of planned development consented under application no. 20/00759/FUL (266 homes) at Swindon Farm~~Village~~, within the North West Cheltenham Development Area – Policy A4.	Moderate adverse construction	Access: both construction traffic and incoming residents (assumed between 60 households and 200 households during the Scheme construction phase) would be expected to use the A4019 as a key access route, although alternative options are available from the east. Essential mitigation has been proposed through the CEA process, which focuses on successful co-ordination, programming, and community engagement in relation to the interaction of the Scheme and this development proposal. As this

Receptor	Significant residual effect	Summary description
		relies on third parties, the assessment has taken a precautionary approach
Incoming residents of planned development seeking consent under application no 23/00354/OUT (180 homes), within the North West Cheltenham Development Area – Policy A4.	Moderate adverse construction	Access: both construction traffic and incoming residents (assumed up to 45 households) would be expected to use the A4019 as a key access route, although alternative options are available from the east. Essential mitigation has been proposed through the CEA process, which focuses on successful co-ordination, programming, and community engagement in relation to the interaction of the Scheme and this development proposal. As this relies on third parties, the assessment has taken a precautionary approach
Private property and housing – operation		
Retained residential properties at Uckington.	Moderate adverse operational	Impacts on key characteristics of the settlement from demolition of buildings and urbanisation of the junction of The Green with the A4019, as well as the A4019 corridor
<30 homes at Uckington.	Moderate beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
<30 homes adjacent to M5 Junction 10, including at Stanboro Lane and fronting the A4019.	Moderate beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
Sheldon Cottages.	Moderate beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
Informal Traveller site adjacent to the M5, north of Junction 10.	Moderate beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
Voyage Care, Orchard Leigh.	Moderate beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
<30 homes at Boddington.	Moderate beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
Properties west of Elmstone Hardwicke.	Moderate beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
Planned development seeking consent under application 21/02832/OUT (215 homes) relating to part of the site	Moderate beneficial operational	Improvements to access for a range of modes arising from Scheme implementation

Receptor	Significant residual effect	Summary description
allocated as Policy H2 Lansdown industrial estate.		
Planned development consented under application 21/00872/REM (85 homes) relating to the south-west portion of land allocated under Policy HD8 Old Gloucester Road (175 homes).	Moderate beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
Planned development seeking consent under application 16/02000/OUT (4115 homes) relating to land allocated under Policy A4 – the North West Cheltenham Development Area (4285 homes).	Large beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
Planned development consented under application 20/00759/FUL (266 homes), within the North West Cheltenham Development Area – Policy A4.	Large beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
Planned development seeking consent under application 23/00354/OUT (180 homes), within the North West Cheltenham Development Area – Policy A4.	Large beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
Planned development seeking consent under applications 22/01817/OUT and 22/01107/OUT within West Cheltenham Development Area (1100 homes) – Policy A7.	Large beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
Policy SD5 – safeguarded land to the north-west of Cheltenham, north east of M5 Junction 10 (assumed for the ES to be at least 2000 homes).	Large beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
Properties in north-west Cheltenham (well over the150 home threshold used in the assessment).	Large beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
Properties between Uckington and the Gallagher Retail Park, (fronting or accessed from the A4019).	Large beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
Community land and assets – construction		
West Cheltenham Fire Station.	Moderate adverse construction	Impacts on the provision of emergency access/response through the areas under traffic management

Receptor	Significant residual effect	Summary description
		during the construction works. Essential mitigation has been identified in the form of an emergency vehicle movement plan; however, the assessment is precautionary, recognising that the effectiveness of the mitigation depends on the PC and the ability to avoid any unforeseen conflicts between construction activities and vehicle passage during an emergency response
Community land and assets – operation		
Cheltenham Civil Service Tennis and Football Clubs.	Moderate beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
West Cheltenham Fire Station.	Moderate beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
Development land and local businesses – construction		
Gloucester Detailing valeting service.	Large adverse construction	Demolition
Sheldon Nurseries premises.	Large adverse construction	Demolition
Gallagher Retail Park.	Moderate adverse construction	Impacts on access to these shopping and trading destinations and in recognition that due to the nature of the use, interruptions or delays to access may affect operational requirements, as well as deter customers. Essential mitigation has been identified that includes for close liaison between the PLO and affected businesses in order to tailor traffic management and this has the potential to reduce the magnitude of the impact; however, a precautionary approach has been taken to the assessment to reflect the inherent uncertainty of how this will manifest once the PC is in place
Kingsditch Trading Estate.	Moderate adverse construction	Impacts on access to these shopping and trading destinations and in recognition that due to the nature of the use, interruptions or delays to access may affect operational requirements, as well as deter customers. Essential mitigation has been identified that includes for close liaison between the PLO and affected businesses in order to tailor traffic management and this has the potential to reduce the magnitude of

Receptor	Significant residual effect	Summary description
		the impact; however, a precautionary approach has been taken to the assessment to reflect the inherent uncertainty of how this will manifest once the PC is in place
Junction 10 breakfast van.	Moderate adverse construction	The loss of the established business location (lay-by). The business is mobile in nature and essential mitigation allows for discussions regarding the identification of mitigation for this adverse effect – it is possible that this will reduce the magnitude of the impact; however, a precautionary approach has been taken to the assessment to reflect the inherent uncertainty of how this will manifest once discussions conclude
Development land and local businesses – operation		
Bailey's Nurseries.	Moderate beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
Aldi and neighbouring business premises at the A4019, B4634 junction.	Moderate beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
Gloucester Old Spot public house.	Moderate beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
Stanboro Cottage Fish Farm.	Moderate beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
Elmstone Business Park.	Moderate beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
Blaisdon Way Commercial Premises.	Moderate beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
The House in the Tree public house.	Moderate beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
Comfy Campers.	Moderate beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
Cheltenham Auto Services.	Moderate beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
Distinctive Ironwork.	Moderate beneficial operational	Improvements to access for a range of modes arising from Scheme implementation

Receptor	Significant residual effect	Summary description
Premier Inn Cheltenham north-west and associated restaurants.	Moderate beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
Arle Nursery.	Moderate beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
Cheltenham Fencing.	Moderate beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
Applegreen filling station and associated businesses.	Moderate beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
Holmedale Guest House.	Moderate beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
Gateway Retail Park.	Moderate beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
Gallagher Retail Park.	Large beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
Kingsditch Trading Estate.	Large beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
Policy A4 – North West Cheltenham Development Area (23 ha. employment allocation).	Large beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
Policy A7 – West Cheltenham Development Area (45 ha. employment allocation).	Large beneficial operational	Improvements to access for a range of modes arising from Scheme implementation
Agricultural land holdings – construction		
Holding B.	Large adverse construction	Siting of FSA and loss of Farm Woodland Scheme payments
Holding C.	Moderate adverse construction	Land take and severance
Holding F.	Moderate adverse construction	Land take and severance
Holding H.	Moderate adverse construction	Land take, flood storage and severance
Holding I.	Moderate adverse construction	Land take and severance
Walkers, cyclists and horse riders – construction		
Uckington footpath 8 (AUC8).	Moderate adverse construction	Length of diversion required to maintain WCH movement
Boddington footpath 14 (ABO14).	Moderate adverse construction	Length of diversion required to maintain WCH movement

Receptor	Significant residual effect	Summary description
Boddington footpath 16 (ABO16).	Large adverse construction	Length of diversion required to maintain WCH movement
Uckington footpath 11 (AUC11).	Large adverse construction	Length of diversion required to maintain WCH movement
Boddington footpath 24 (ABO24).	Large adverse construction	Length of diversion required to maintain WCH movement
Cheltenham Circular Route, including AUC8, AUC14 and ABO25).	Large adverse construction	Length of diversion required to maintain WCH movement
Uckington Bridleway 1 (AUC1).	Very large adverse construction	Due to the closure of the route to horse riders for the duration of the construction works. This has been identified through the consultation process as important for the safety of horses, which are to be kept apart from construction activities, and therefore also for horse riders. There is also a severance of the route and diversion for other user groups

Human Health assessment

13.18.7. The construction and operation of the Scheme is anticipated to generate changes to wider health determinants in the immediate vicinity of the Scheme and residents of the wards that form the study area for the Human Health assessment. An assessment of the likely nature of these changes has been made, based on a detailed yet proportionate collation and evaluation of desktop study and other data sources covering identified determinants of health.

13.18.8. Human health receptors have been identified and clustered on the basis of shared physical characteristics and/or location. The impacts of the Scheme on these receptor groups have been assessed under following topics, which link to the health determinants:

- **Community, recreational and educational facilities**: accessibility and severance in relation to community, recreational and educational facilities and consideration of social cohesion, including changes in the distribution and amount of housing.
- **Green space and outdoor space**: accessibility and severance in relation to green space and open space as recreational assets.
- **Healthcare**: accessibility and severance in relation to healthcare facilities (as a specific sub-set of **community facilities**), including groups and networks supporting mental health identified through consultation.
- **Transport network**: changes to the existing spatial characteristics of the transport network and usage in the study area, encompassing the road network, PRoW, cycle ways, non-designated public routes, and public transport.
- **Air quality**: changes to ambient air quality and impacts for AQMA.
- **Noise environment and vibration**: changes to noise levels and noise generation in the study area, including the presence of areas sensitive to noise such as NIAs.
- **Soil and water pollution**: changes to the sources and pathways of potential pollution leading to light spill, odour, and contamination.
- **Landscape amenity**: changes to landscape amenity, particularly where this may be linked to health and well-being.
- **Safety information:** with particular focus on transport user safety across modes, including changes to risk of injury and deaths for all users.

13.18.9. The assessment has identified the impacts to each receptor group that have the potential to result in significant effects once approaches to avoiding, lessening, or mitigating effects have been taken into account. The summary assumes that both embedded and essential mitigation measures are fully implemented, resulting in the identification of potentially significant residual effects. The results are summarised in Table 13-59.

Table 13-59 – Summary of significant residual effects – Human Health assessment

Receptor	Significant residual effect	Summary of description
Wider population – construction		
Wider population (rural context)	Large adverse construction	Health and wellbeing outcomes associated with demolition.
Wider population (rural context)	Moderate adverse construction	Health and wellbeing outcomes associated with changes to air quality, noise and landscape amenity
Wider population (urban context)	Moderate adverse construction	Health and wellbeing outcomes associated with changes to landscape amenity and demolition.
Wider population – operation		
Wider population (all treated as urban context)	Moderate beneficial operation (FY)	Health and wellbeing outcomes associated with access improvements for a range of modes and to community facilities at FY.
Wider population (all treated as urban context)	Moderate adverse operation (FY)	Health and wellbeing outcomes associated with changes to landscape amenity at FY.
Sub-populations – construction		
Sub populations: Families with children and adolescents People who are physically or mentally disadvantaged	Large adverse construction	Health and wellbeing outcomes associated with change in landscape amenity
Sub populations: Families with children and adolescents People who are physically or mentally disadvantaged	Moderate adverse construction	Health and wellbeing outcomes associated with changes to air quality, safety, access, noise and separation from open space and recreational routes.
Sub populations: People who are materially disadvantaged People from black and minority ethnic groups	Moderate adverse construction	Health and wellbeing outcomes associated with changes to safety and access.
Sub populations: People who are materially disadvantaged People from black and minority ethnic groups	Moderate beneficial construction	Health and wellbeing outcomes associated with vocational training opportunities through construction work.
Sub-populations – operation		
Sub populations:	Moderate beneficial operation	Health and wellbeing outcomes associated with access improvements for a range of

Receptor	Significant residual effect	Summary of description
Families with children and adolescents People who are physically or mentally disadvantaged People who are materially disadvantaged People from black and minority ethnic groups		modes and to community facilities at OY; and improvements to safety at OY and FY, due to the removal of modal conflicts and enhanced WCH routes arising from Scheme implementation.
Sub populations: Families with children and adolescents People who are physically or mentally disadvantaged People who are materially disadvantaged People from black and minority ethnic groups	Large beneficial operation (FY)	Health and wellbeing outcomes associated with access improvements for a range of modes and to community facilities at FY.
Geographic sub-populations – construction		
Residents of properties at Uckington, Moat Lane and Cooks Lane	Very large adverse construction	Health and wellbeing outcomes associated with changes in landscape amenity
Residents of properties at Homecroft Drive and Appleyard Close (north)	Very large adverse construction	Health and wellbeing outcomes associated with the demolition of properties.
Residents of properties at Withybridge Gardens, Withybridge Lane and Stanboro Lane	Very large adverse construction	Health and wellbeing outcomes associated with the demolition of properties and changes in landscape amenity.
Users of PRoW and WCH networks	Large adverse construction	Health and wellbeing outcomes associated to changes in landscape amenity
Residents of properties at Uckington, Moat Lane and Cooks Lane	Moderate adverse construction	Health and wellbeing outcomes associated with changes in access arrangements
Residents of properties adjacent to the B4634	Moderate adverse construction	Health and wellbeing outcomes associated with changes in landscape amenity
Residents of properties at Homecroft Drive and Appleyard Close (north)	Moderate adverse construction	Health and wellbeing outcomes associated with changes in access arrangements
Users of PRoW and WCH networks	Moderate adverse construction	Health and wellbeing outcomes associated with changes in access arrangements; separation from open space and recreational routes; and changes to safety due to the presence of construction works.
Geographic sub-populations – operation		
Residents at Uckington, Moat Lane and Cooks Lane	Moderate adverse operation (FY)	Health and wellbeing outcomes associated with changes in landscape amenity.

Receptor	Significant residual effect	Summary of description
Residents of properties adjacent to the B4634	Moderate adverse operation (FY)	Health and wellbeing outcomes associated with changes in landscape amenity in FY.
Residents of properties at Withybridge Gardens, Withybridge Lane and Stanboro Lane	Moderate adverse operation (FY)	Health and wellbeing outcomes associated with changes in landscape amenity in FY.
Residents of properties at north west Cheltenham	Moderate beneficial operation (OY and FY)	Health and wellbeing outcomes associated with access improvements for a range of modes and to community facilities in OY and FY.
Residents of properties within Springbank	Moderate beneficial operation (OY and FY)	Health and wellbeing outcomes associated with access improvements for a range of modes and to community facilities in OY and FY.
Residents of properties adjacent to the B4634	Moderate beneficial operation (OY)	Health and wellbeing outcomes associated with access improvements for a range of modes and to community facilities in OY
Residents of Swindon Village	Moderate beneficial operation (FY)	Health and wellbeing outcomes associated with access improvements for a range of modes and to community facilities in FY
Residents at Uckington, Moat Lane and Cooks Lane	Large beneficial operation (OY)	Health and wellbeing outcomes associated with access improvements for a range of modes and to community facilities in OY
Residents of properties adjacent to the B4634	Large beneficial operation (FY)	Health and wellbeing outcomes associated with access improvements for a range of modes and to community facilities in FY
Residents of properties at Homecroft Drive and Appleyard Close (north)	Large beneficial operation (OY and FY)	Health and wellbeing outcomes associated with access improvements for a range of modes and to community facilities in OY and FY.
Residents of properties at Withybridge Gardens, Withybridge Lane and Stanboro Lane	Large beneficial operation (OY)	Health and wellbeing outcomes associated with access improvements for a range of modes and to community facilities in OY
Residents at Uckington, Moat Lane and Cooks Lane	Very large beneficial operation (FY)	Health and wellbeing outcomes associated with access improvements for a range of modes and to community facilities in FY
Residents of properties at Withybridge Gardens, Withybridge Lane and Stanboro Lane	Very large beneficial operation (FY)	Health and wellbeing outcomes associated with access improvements for a range of modes and to community facilities in FY
Users of PRoW and WCH networks	Large beneficial operation ~~(OY and FY)~~	Health and wellbeing outcomes associated with improved safety in OY and FY, and access improvements for a range of modes and to community facilities in OY only.
Users of PRoW and WCH networks	Very large beneficial operation (FY)	Health and wellbeing outcomes associated with access improvements for a range of modes and to community facilities in FY.

Receptor	Significant residual effect	Summary of description
Community assets – construction		
West Cheltenham Fire Station	Moderate adverse construction	Health and wellbeing outcomes associated with changes in access arrangements
Users of Cheltenham Civil Service Tennis and Football Clubs	Moderate adverse construction	Health and wellbeing outcomes associated with increases in noise due to construction activities and construction worker traffic movements.
Community assets – operation		
West Cheltenham Fire Station	Large beneficial operation (OY and FY)	Health and wellbeing outcomes associated with access improvements for a range of modes and to community facilities in OY and FY
Users of Cheltenham Civil Service Tennis and Football Clubs	Large beneficial operation (OY and FY)	Health and wellbeing outcomes associated with access improvements for a range of modes and to community facilities in OY and FY
Employment and training assets – construction		
Employers and employees of businesses adjacent to the A4019	Large adverse construction	Health and wellbeing outcomes associated with changes in landscape amenity.
Employees and students at Greensteps, National Star	Moderate adverse construction	Health and wellbeing outcomes associated with changes in access arrangements
Employees at Gallagher Retail Park and Kingsditch Trading Estate	Moderate adverse construction	Health and wellbeing outcomes associated with changes in access arrangements
Employers and employees of businesses adjacent to the A4019	Moderate adverse construction	Health and wellbeing outcomes associated with changes in access arrangements
Employment and training assets – operation		
Employees at Gallagher Retail Park and Kingsditch Trading Estate	Moderate beneficial operation (OY)	Health and wellbeing outcomes associated with access improvements for a range of modes and to community facilities in OY.
Employees and students at Greensteps, National Star	Large beneficial operation (OY and FY)	Health and wellbeing outcomes associated with access improvements for a range of modes and to community facilities in OY and FY
Employees at Gallagher Retail Park and Kingsditch Trading Estate	Large beneficial operation (FY)	Health and wellbeing outcomes associated with access improvements for a range of modes and to community facilities in FY
Employers and employees to businesses adjacent to the A4019	Large beneficial operation (OY)	Health and wellbeing outcomes associated with access improvements for a range of modes and to community facilities in OY.
Employers and employees to businesses adjacent to the A4019	Very large beneficial operation (FY)	Health and wellbeing outcomes associated with access improvements for a range of modes and to community facilities in FY.

Cumulative effects

13.18.10. A sensitivity assessment has been undertaken to consider the potential for significant residual cumulative effects within the Population and Human Health topic. The impact types are not relevant to the Population assessment. The Human Health assessment is reported in Section 13-26, informed by traffic modelling of specific M5 Junction 10 slip road closure scenarios and consequential air quality and noise assessment.

13.18.11. Taking account of the mitigation proposed (measures G4, G10, PHH4, PHH7 and PHH9 as set out in the REAC (~~a~~Application document: TR010063/APP/7.4)), the residual effects of the M5 slip road closures on human health receptors are considered to include the following significant adverse cumulative human health effects (on a precautionary basis):

- **Residents of Uckington** – moderate adverse in-combination cumulative effects, principally due to changes in noise and to characteristics of the transport network.
- **Families with children and adolescents (rural and urban context)** – moderate adverse in-combination cumulative effects, principally due to changes in noise and the characteristics of the transport network.

13.18.12. An assessment of cross-topic intra-Scheme cumulative effects and inter-project cumulative effects in relation to Population and Human Health is reported in Section 13-16 cumulative effects. The cross-topic intra-Scheme cumulative effects and inter-project cumulative effects identified within Section 13-16 cumulative effects informed the basis of the detail in Chapter 15 - Cumulative Effects Assessment (~~a~~Application document TR010063/APP/6.13).

13.18.13. The assessment identified which RFFPs may result in inter-project cumulative effects in relation to the scope of the Population and Human Health assessments. Key interactions were identified with ~~five~~ four RFFPs, which comprise:

- 16/02000/OUT (Elms Park) – relating to land allocated under Policy A4 – North West Cheltenham Development Area.
- 20/00759/FUL (Swindon Farm) – relating to part of the land allocated under Policy A4 – North West Cheltenham Development Area).
- Safeguarded land to the north-west of Cheltenham (Policy SD5).
- 22/01817/OUT and 22/01107/OUT – relating to part of the land allocated under Policy A7 – West Cheltenham Development Area.
- ~~21/00872/REM Phase 1 Land at Old Gloucester Road – relating to part of the land allocated under Policy HD8 – Strategic Site – land to the north of Old Gloucester Road.~~

13.18.14. Significant cumulative inter-project effects were identified between the Scheme and four ~~of the above five~~ RFFPs, as summarised in Table 13-60 and Table 13-61.

Table 13-60 – Summary of significant residual effects – additive cumulative inter-project effects within topic – construction

Receptor	Additive cumulative inter-project effects	Summary description
16/02000/OUT (Elms Park) – relating to land allocated under and Policy A4 – North West Cheltenham Development Area.	Moderate adverse Construction	Potential for construction impacts of the Scheme to interact with those of the early construction stages of the RFFP to generate additive cumulative adverse effects upon nearby residential receptors; residents at Uckington and Homecroft Drive and staff and users of business and community facilities within Gallagher Retail Park.
20/00759/FUL (Swindon Farm) – relating to part of the land allocated under Policy A4 – North West Cheltenham Development Area.	Moderate adverse Construction	Potential for construction impacts of the Scheme to interact with those of the early construction stages of the RFFP to generate additive cumulative adverse effects upon nearby residential receptors; residents of Uckington and along the A4019 east of Uckington residents and staff and users of business and community facilities within Gallagher Retail Park.
Safeguarded land to the north-west of Cheltenham (Policy SD5).	Moderate adverse Construction	Potential for construction impacts of the Scheme to interact with those of the early construction stages of the RFFP to generate additive cumulative adverse effects upon nearby residential receptors; residents of Uckington and the A4019 between M5 Junction 10 and Uckington.
22/01817/OUT and 22/01107/OUT – relating to part of the land allocated under Policy A7 – West Cheltenham Development Area.	Moderate adverse Construction	Potential for construction impacts of the Scheme to interact with those of the early construction stages of the RFFP to generate additive cumulative adverse effects upon nearby residential receptors; residents along the B4634 close to the proposed Link Road junction, as well as staff and users of the House in the Tree pub.

Table 13-61 – Summary of significant residual effects – additive cumulative inter-project effects within topic - operation

Receptor	Significant residual effect	Summary description
16/02000/OUT and Policy A4 – North West Cheltenham Development Area.	Large beneficial operation	The Scheme will result in beneficial impacts on the prospective residents of the RFFP associated with improvements in multi-modal access.
20/00759/FUL (Swindon Farm) – relating to part of the land allocated under Policy A4 – North West Cheltenham Development Area.	Large beneficial operation	The Scheme will result in beneficial impacts on the prospective residents of the RFFP associated with improvements in multi-modal access.
Safeguarded land to the north-west of Cheltenham (Policy SD5).	Large beneficial operation	The Scheme will result in beneficial impacts on the prospective residents of the RFFP associated with improvements in multi-modal access.
22/01817/OUT and 22/01107/OUT – relating to part of the land allocated under Policy A7 – West Cheltenham Development Area.	Moderate beneficial operation	The Scheme will result in beneficial impacts on the prospective residents of the RFFP associated with improvements in multi-modal access; and wider benefits to residents of this part of the study area as a result of additive cumulative effects of increased availability of community assets (due to the RFFP land use proposals for community hub, education and recreational provision) and accessibility to facilities and services.

13.19. References

DMRB Standard (LA112). https://www.standardsforhighways.co.uk/dmrb/search/1e13d6ac-755e-4d60-9735-f976bf64580a

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Appendices

Appendix 13.1 – Figures

Provided as a separate appendix, Aapplication document TR010063/APP/6.15.

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