

A47 Wansford to Sutton Dualling

Scheme Number: TR010039

Volume 6

6.1 Environmental Statement

Chapter 12 – Population and human health

APFP Regulation 5(2)(a)

Planning Act 2008

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

March 2022

Deadline 4

Infrastructure Planning

Planning Act 2008

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

A47 Wansford to Sutton
Development Consent Order 202[x]

ENVIRONMENTAL STATEMENT
Chapter 12 – Population and human health

Regulation Number:	Regulation 5(2)(a)
Planning Inspectorate Scheme Reference	TR010039
Application Document Reference	TR010039/APP/6.1
BIM Document Reference	HE551494-GTY-EPC-000-RP-LX-00001
Author:	A47 Wansford to Sutton Project Team, National Highways

Version	Date	Status of Version
Rev 0	July 2021	Application Issue
Rev 1	August 2021	Updated following PINS Advice
Rev 2	February 2022	Deadline 2
Rev 3	March 2022	Deadline 4

Table of contents

12.	Population and human health	2
	Introduction	2
	Competent expert evidence	4
	Legislation and policy framework	4
	Assessment methodology	7
	Assessment assumptions and limitations	19
	Study area	20
	Baseline conditions	20
	Potential impacts	40
12.1.	Design, mitigation and enhancement measures	43
12.2.	Assessment of likely significant effects	46
12.3.	Monitoring	66
12.4.	Summary	67
12.5.	References	68
12.6.	Glossary	71
12.7.		
12.8.	Figures	
12.9.	Figure 12.1: Population and human health constraints plan	
12.10.	Figure 12.2: Design, mitigation and enhancement measures	
12.11.	Figure 12.3: Walking, cycling horse-riding survey locations	
12.12.	Figure 12.4: Agricultural Land Holdings	
12.13.		
12.14.	Tables	
	Table 12-1: Sensitivity of receptors	13
	Table 12-2: Magnitude of impact	15
	Table 12-3: Human health outcome categories	19
	Table 12-4: Sensitivity of agricultural land holdings	25
	Table 12-5: WCH facilities in the study area	26
	Table 12-6: Sensitivity of WCH routes to changes in journey length	29
	Table 12-7: Health profiles for Glington and Wittering (Wittering), Elton and Folksworth, and Stilton (Stilton, Folksworth and Washingley), Prebendal and Bamack wards	35
	Table 12-8: Health determinants for Glington and Wittering, Elton and Folksworth, and Stilton Prebendal and Bamack wards	36
	Table 12-9: Information collated from stakeholder consultation	39
	Table 12-10: Residual effects on private property and housing during construction	48
	Table 12-11: Residual effects on community land and assets during construction	50
	Table 12-12: Residual effects on development land and businesses during construction	51
	Table 12-13: Assessment of temporary construction impacts on agricultural holdings	54
	Table 12-14: Assessment of permanent construction impacts on agricultural holdings	55
	Table 12-15: Residual effects on WCH during construction	59
	Table 12-16: Residual construction effects on human health	60
	Table 12-17: Residual operation effects on WCH	64
	Table 12-18: Residual operation effects on human health	65

12. Population and human health

Introduction

- 12.1.1. Highways England (the Applicant) has submitted an application for a development consent order (DCO) for the A47 Wansford to Sutton Scheme (hereafter referred to as 'the Proposed Scheme'). The Proposed Scheme comprises the dualling of a section of the A47 between Wansford to Sutton; improvements to the A47 Wansford junction; creation of the A47 Sutton Heath roundabout to replace the Nene Way roundabout; associated side road alterations; and walking, cycling and horse-riding connections.
- 12.1.2. This section of A47 road is currently unable to cope with the high traffic volume and there are limited opportunities to overtake slower moving vehicles on the single carriageway. The Proposed Scheme aims to reduce congestion related delay, improve journey time reliability and increase the overall capacity of the A47. Full details of the Proposed Scheme are provided in Environmental Statement Chapter 2 (The Proposed Scheme) (**TR010039/APP/6.1**).
- 12.1.3. The key elements of the Proposed Scheme include:
- approximately 2.6km of new dual carriageway constructed largely offline of the existing A47, including the construction of two new underpasses
 - a new free-flow link road connecting the existing A1 southbound carriageway to the new A47 eastbound carriageway
 - a new link road from the Wansford eastern roundabout to provide access to Sacrewell Farm, the petrol filling station and the Anglian Water pumping station
 - closure of the existing access to Sacrewell Farm with a new underpass connecting to the farm from the link road provided
 - a new slip road from the new A47 westbound carriageway also providing access to the petrol filling station
 - a link road from the new A47 Sutton Heath roundabout, linking into Sutton Heath Road and Langley Bush Road
 - new junction arrangements for access to Sutton Heath Road and Langley Bush Road
 - closure of the existing accesses to the A47 from Sutton Heath Road, Sutton Drift and Upton Road
 - new passing places and limited widening along Upton Drift (also referenced as Main Road)
 - new walking, cycling and horse-riding routes, including a new bridleway underpass at the disused railway
 - new safer access to the properties on the A1, north of Windgate Way

- installation of boundary fencing, safety barriers and signage
- new drainage systems including:
 - two new outfalls to the River Nene
 - a new outfall to Wittering Brook
 - extension of the A1 culvert at the Mill Stream
 - realignment and extension of the A47 Wansford Sluice
 - compensatory flood storage
 - drainage ditch interceptors
 - new attenuation basins, with pollution control devices, to control discharges to local watercourses
- River Nene compensatory flood storage area
- works to alter or divert utilities infrastructure such as electricity lines, water pipelines and telecommunications lines
- temporary compounds, material storage areas and vehicle parking required during construction
- environmental mitigation measures

12.1.4. Under the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, the Proposed Scheme is an Environmental Impact Assessment (EIA) development and as such requires submission of an Environmental Statement (ES) presenting the likely significant environmental effects of the Proposed Scheme.

12.1.5. As part of the EIA process, this ES chapter reports the potential significant effects for population and human health as a result of the Proposed Scheme. This assessment includes a review of the existing baseline conditions, consideration of the potential impacts and identification of proportionate mitigation and enhancement.

12.1.6. The requirement to carry out an assessment of potential impacts on population and human health is set out in EIA Directive (2014/52/EU), which is implemented through Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.

12.1.7. The approach to this assessment has been updated since the Scoping Report (February 2018) (**TR010039/APP/6.5**) and subsequent agreed Scoping Opinion (March 2018) (**TR010039/APP/6.6**). This ensures accordance with the most up to date standards in the Design Manual for Roads and Bridges (DMRB), LA 112 Population and human health.

12.1.8. Key guidance on health effects identifies that any assessment should aim to predict the health and wellbeing outcomes of the policy or project being assessed. This includes the Institute for Environmental Management &

Assessment (IEMA) Health in Environmental Impact Assessment - A Primer for a Proportionate Approach 2017 used within this assessment.

- 12.1.9. This chapter considers the effects on private property, community land and assets, future development, local businesses, agricultural land and walkers, cyclists and horse riders (WCH). An assessment of the impact of the Proposed Scheme on the health of local populations has also been undertaken, using information from other chapters where relevant.

Competent expert evidence

- 12.2.1. The technical lead for the preparation of this chapter is a suitably qualified Chartered Environmentalist with 17 years' relevant experience of similar projects and impact assessments. The technical lead has a BSc (Hons) in Environmental Management and is a Full Member of the Institute of Environmental Management and Assessment (IEMA). The technical lead has used their EIA knowledge and professional judgement in identifying the likely significant impacts associated with the Proposed Scheme and providing technical guidance through the assessment process.

Legislation and policy framework

- 12.3.1. The following legislation and policies have been considered as part of this assessment:
- The Countryside and Rights of Way Act (2000) (CRoW Act). The CRoW Act regulates public rights of way (PRoW) and open access land and ensures access to them.
 - The Infrastructure Planning (Environmental Impact Assessment) Regulations (2017) requires the assessment of population and human health as part of this ES.
 - National Policy Statement for National Networks ((NPS NN) 2014): The NPS NN sets out the need for and the Government's policies to deliver development of Nationally Significant Infrastructure Projects on the national road network in England and also sets out the primary basis for making decisions of development consent for nationally significant infrastructure projects in England. The Government recognises in the appraisal of sustainability accompanying the NPS NN that some developments would have some adverse local impacts on noise, air quality emissions, landscape and visual amenity. The significance of these effects and the effectiveness of mitigation is uncertain at the strategic and non -locational specific level of the NPS NN. Therefore, whilst applicants should deliver developments in accordance with government policy and in an environmentally sensitive way, including considering opportunities to deliver environmental benefits, some adverse local effects of development may remain.

- Health and Social Care Act (2012): The Act was introduced following the Health and Social Care Bill 2011 and outlines the Secretary of State's duty to promote and improve the National Health Service (NHS), in pursuit of a number of key aims, which include:
 - an improvement in the quality of services
 - a reduction in health inequalities
 - the promotion of autonomy for General Practitioners and health centres
 - improvements to the treatments and services offered to patients
- Public Health England's Public Health Outcomes Framework (2019): This framework sets out a vision for public health, desired outcomes and the indicators that would help us understand how well public health is being improved and protected. The framework concentrates on two high-level outcomes (healthy life expectancy, and the differences in life expectancy and healthy life expectancy between communities) to be achieved across the public health system, and groups further indicators into four 'domains' that cover the full spectrum of public health. The outcomes reflect a focus not only on how long people live, but on how well they live at all stages of life.
- Peterborough Health and Wellbeing Board (Peterborough City Council) Health and wellbeing 2016- 2019 strategy: This strategy aims to prioritise the health needs of local residents within development. The strategy outlines the joint plans of the Health and Wellbeing Board to address these needs and health challenges.
- Cambridgeshire¹ and Peterborough Draft Health and Wellbeing Strategy 2019- 2024: This strategy aims to support and promote the health and wellbeing of residents in Peterborough and Cambridgeshire, engaging with NHS organisations, the community and voluntary sector and other stakeholders. The following key priorities are focused on within the strategy:
 - Priority 1: Places that support health and wellbeing
 - Priority 2: Helping children achieve the best start in life
 - Priority 3: Staying healthy throughout life
 - Priority 4: Quality health and social care
- New Housing Developments and the Built Environment Joint Strategic Needs Assessment (JSNA) 2015/2016: Informs the local health and wellbeing strategy for Cambridgeshire County Council by providing data analysis, gaps in information and local community views, highlight key findings in terms of new housing developments and the built environment.

¹ Cambridgeshire County Council boundary is located adjacent to the Proposed Scheme boundary (to the south) and is therefore considered in this assessment.

The JSNA identifies that the provision of green space and infrastructure has positive health impacts through the co-benefits that occur when accessing it such as physical activity and social interaction.

- Transport and Health Joint Strategic Needs Assessment (2017) and Core dataset (2020): Informs the local health and wellbeing strategy for Cambridgeshire County Council by providing data analysis, gaps in information and local community views, highlight key findings, such as for Active Travel, Access to Transport and Air Pollution. For Active Travel, this highlights that a future focus would include providing infrastructure that encourages active transport, such as the creation of direct or shorter routes for cyclists and pedestrians. The Transport and Health Joint Strategic Needs Assessment dataset by Peterborough City Council states that increased levels of active travel in Peterborough would improve health outcomes in Peterborough.
- Peterborough City Council Local Plan (2016 – 2036): Policy LP7 states that ‘Development proposals should promote, support and enhance both the physical and mental health and wellbeing of the community, contributing to reducing health inequalities and helping to deliver healthy, active lifestyles’. The Health and wellbeing policy provides cross cutting themes and should be read alongside other policies in the Local Plan that seek to address the wider determinants of health.
- Peterborough City Council Local Plan (2016 – 2036): Policy LP13 Sustainable Transport Network. The policy for transport aims to reduce the need to travel by private car and helps to deliver a sustainable transport package capable of supporting growth and the council’s Environment Capital aspirations. The main element of this policy in relation to the proposed scheme is: “Seek to improve sustainable transport links to travel hubs from rural areas and improve walking and cycle links between villages.....”
- Peterborough Rights of Way Improvement Plan (2016 – 2026): Although there are no specific improvements outlined for the rights of way within the study area, the plan outlines a number of core objectives which are relevant to all rights of way including:
 - Reduce the number of unnecessary physical barriers to the network and improve the means of way marking to help users and landowners;
 - Develop functional and well maintained routes into the countryside and to nearby settlements for local use, and;
 - Help people wishing to improve or maintain their health by maintaining a range of circular off road routes

- Peterborough Local Cycling and Walking Infrastructure Plan (2019 – 2029):
There are no specific improvements outlined for the cycling and walking within the study area. However, the plan outlines that any improvements to infrastructure should provide the opportunity to create attractive environments and build in coherent, convenient and safe links for walking and cycling.

Assessment methodology

12.4.1. The following standards and guidance have been used to inform the assessment:

- DMRB LA 112 Population and human health (Revision 1)
- IEMA Health in EIA: A Primer for a Proportionate Approach
- Health Impact Assessment Tools (Department of Health, 2010)

12.4.

12.4.2. In line with DMRB LA 112, this assessment considers the impacts of the Proposed Scheme on the following:

- Land use and accessibility, including:
 - private property and housing
 - community land and assets
 - development land and businesses
 - agricultural land holdings
 - walkers, cyclists and horse riders (WCH)
- Human health, including:
 - existing health profiles of affected communities
 - existing health determinants, comprising the following:
 - access to healthcare facilities
 - access to community, recreation and education facilities
 - access to green and open space
 - existing and predicted levels of air and noise pollution
 - landscape amenity
 - sources and pathways of potential pollution (eg land and water contamination)
 - local transport network
 - likely health outcomes

12.4.3. Baseline information has been gathered using desktop sources, information collected for the other topic assessments in this Environmental Statement and consultation. The WCH assessment has also incorporated survey results, from surveys undertaken in 2018. The following desktop sources have been used:

- Ordnance Survey mapping
- OS Address Point Data
- Google street view
- Multi-Agency Geographic Information for the Countryside (MAGIC) mapping
- Peterborough City Council Local Plan, including Peterborough City Council Site Allocations Development Plan document
- Huntingdonshire Local Plan 2036
- Peterborough City Council PRow mapping tool
- Northamptonshire County Council PRow mapping tool
- Public Health England, Local Health Profile (Fingertips)
- Office for National Statistics data
- Census data

Update to standards and scope of assessment

12.4.4. Following a review of the updates to DMRB LA 112 Population and human health published in 2019, the original scope as set out in the 2018 Scoping Report (**TR010039/APP/6.5**) has changed.

12.4.5. In the previous DMRB standard 'population and human health' topic was referred to as 'People and Communities' and often assessed under two separate chapters: 'Community and private assets' and 'Effects on all travellers'. Driver stress, view from the road and WCH² amenity are no longer included within the scope of this chapter due to the changes to standards.

12.4.6. Severance is now assessed in terms of separation of communities from assets and areas of community land, alterations to private properties (including their access) and severance of WCH routes.

12.4.7. Human health is now recognised as a key consideration in decision-making of development projects, including highways. As such, it is a new topic within DMRB LA 112 and has therefore been included within the scope of this assessment.

² The term Non-Motorised User (NMU) which was used in the previous DMRB has now been replaced with walkers, cyclists and horse-riders (WCH) and this term has been used for the remainder of the Population and human health assessment

- 12.4.8. The study areas have also been updated in line with the latest DMRB standards, as explained in Section 12.6.
- 12.4.9. No alterations to bus public transport services are included in the Proposed Scheme. It is considered the overall impact of the Proposed Scheme on bus transport users would be beneficial due to the congestion relief provided for all highway traffic. As such, an assessment of the impact on bus public transport services is not included within the scope of this assessment.

Surveys

- 12.4.10. To provide an indication of current usage of the PRow and permissive routes and for key locations where WCH activity could occur on the local highways, WCH surveys were undertaken at 12 locations in the study area, as shown in Figure 12.3 (**TR010039/APP/6.2**) and listed below:
- Site 1 – Subway at A47 Black Swan Hill Roundabout.
 - Site 2 – A47 Black Swan Hill Roundabout – Cycle movements only.
 - Site 3 – Peterborough Road at end of permissive route Wansford Nene Way (ID 574).
 - Sites 4, 5 and 6 – A47 Sacrewell Farm access and access along Nene Way permissive footpath opposite.
 - Site 8 – Southern end of footpath exiting onto Nene Way – All Movements.
 - Site 9 – Old Leicester Road and King's Cliffe Road – north and south along PRow – All movements.
 - Site 10 – Southern end of PRow exiting onto Yarwell Road – All movements.
 - Site 11 – Split of PRow on west side of Yarwell Road, in Old Sulehay Forest – All movements.
 - Site 12 – Sutton Crossways at Nene Way – All movements east and west into and out of Sutton Crossways PRow.
 - Site 14 – Old Peterborough Road at junction with Nene Way – All movements in all directions at junction.
 - Site 15 – Old Peterborough Road at junction with A47 – All movements in all directions.
 - Site 16 – Sutton Heath Road – bridleway (Provisional Item) record all movements on Sutton Heath Road (north and south) and on / off bridleway (east and west).

- 12.4.11. Sites 4, 5 and 6 were surveyed as one combined site and not as three separate locations. The surveys were carried out between 7am and 7pm for seven consecutive days between Saturday 26 May 2018 and Friday 1 June 2018 using CCTV video cameras. The weather during the surveys was typically dry and bright. It is expected that the usage information collected is representative of typical weekday and weekend day WCH activity in the study area and is sufficient to inform this assessment.

Consultation

- 12.4.12. Updates to DMRB standards have resulted in changes to the scope of this chapter. The changes have been confirmed to the key consultees (Peterborough City Council, the Planning Inspectorate, Cambridgeshire and Peterborough Clinical Commissioning Group). A response was received from the Planning department at Peterborough City Council to consider including the following wards within the human health study area: Barnack ward, Prebendal ward and King's Forest Ward. Prebendal ward and Barnack ward have been included due to their close proximity to the Proposed Scheme, with facilities that may potentially be impacted by the Proposed Scheme. King's Forest has not been included due to distance from the Proposed Scheme.
- 12.4.13. A response was also received from Cambridgeshire County Council Public Health Department, providing reports and datasets to take into account for this assessment. These have been reviewed as part of the assessment and have been provided within the reference list.
- 12.4.14. Non-statutory consultation was undertaken from 13 March 2017 to 21 April 2017 and included public exhibition events. A consultation report was prepared and can be accessed on the Highways England website³. A statutory public consultation was also undertaken from 18th September to 12th November 2018 and further engagement in 2020, further information is set out in the Consultation Report (**TR010039/APP/5.1**).
- 12.4.15. A consultation meeting was held with Peterborough City Council's PRow officer and a representative from Peterborough Cycle Forum on 8 July 2020. The purpose of the meeting was to understand the walking, cycling and horse-riding issues in the local area and present the emerging WCH strategy for the Proposed Scheme.
- 12.4.16. The Peterborough Cycle Forum highlighted the weaknesses in the current network and aspirations for the A47 scheme, i.e. lack of safe north to south route across the A47 to the east of Wansford, poor standard of the subway at the

³ [REDACTED]

western roundabout and the need for an at grade crossing into Wansford and an improved crossing of the A1 along the A47. They also stated that the recently upgraded permissive route between the picnic area to the south of A47 and the A1 underpass was not conducive to cycling due to the gradients and there appeared to be an issue with the surfacing on the ramp to the west of the A1, which was cracking.

- 12.4.17. The Peterborough Cycle Forum was generally supportive of the proposed east to west shared use routes but stated that it could not support the proposals for the crossing of the north arm of the A47 western roundabout and the proposed on-carriageway cycle lane on the eastbound carriageway of the A47 (across A1) plus the associated crossing in the central reserve. They stated that the proposals were very much against current guidance, were unsafe and unlikely to be used. They also stated that the aspiration would be for the provision of an off-carriageway facility on the southern side of the A47.
- 12.4.18. The Peterborough Cycle Forum highlighted the lack of a north to south crossing of the A47 to the east of Wansford and suggested that consideration should be given to use of the disused railway alignment to provide a grade separated crossing of the new A47 for cyclists and pedestrians.
- 12.4.19. The PRow officer from Peterborough City Council indicated general support for the emerging strategy, especially the proposals for access to Sacrewell Farm and the connections between the shared use facilities and the existing footpath running along the River Nene. The officer was also in agreement that the proposed new route into Sacrewell Farm should have the same status as the existing route, i.e. permissive status.
- 12.4.20. Issues raised during these consultations have been taken into account to develop the design through design interventions, as described in Section 12.10 Design, mitigation and enhancement measures.
- 12.4.21. Questionnaires were sent to nine landowners and occupiers identified as potentially having agricultural land which may be impacted by the Proposed Scheme. Six agricultural questionnaires were returned. Follow up calls and emails were made to the remaining four landowners and occupiers between June and December 2020.
- 12.4.22. Due to design updates in May 2021, four new agricultural land areas, totalling 0.81 ha, have been added. At the time of writing, we have been unable to contact the one occupier for which we have details. The identity of the occupier or landowner is unknown for the remaining three agricultural land areas. It is intended that they would be contacted as part of future ongoing liaison with landowners / tenants.

12.4.23. For the purpose of the agricultural assessment, agricultural holdings have been defined as a single farming unit undertaking agricultural activities under the same management. Agricultural holdings may comprise of numerous land parcels, not all of which may be impacted by the Proposed Scheme. An assessment of the effects of the Proposed Scheme on the agricultural holdings has been made, not an assessment of the effects on the individual land parcels.

Assessment criteria

12.4.24. DMRB LA 112 sets out the requirements for assessing and reporting the environmental effects on population and human health from construction, operation and maintenance of highway projects. This has been used for the assessments within this chapter, as explained below.

Land use and accessibility

Sensitivity of receptors

12.4.25. The sensitivity of land use and accessibility receptors has been determined using the criteria presented in Table 12.1. These criteria are derived from Table 3.11 of DMRB LA 112.

Table 12-1: Sensitivity of receptors

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 are expected to increase by >25% by 2041 (ONS data); and/or 2) existing housing and land allocated for housing (eg strategic housing sites) covering >5ha 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); and 4) the land and assets are used by the majority (>=50%) of the community. Development land and businesses: 1) existing employment sites (excluding agriculture) and land allocated for employment (eg strategic employment sites) covering >5ha. Agricultural land holdings: 1) areas of land in which the enterprise is wholly reliant on the spatial relationship of land to key agricultural infrastructure; and 2) access between land and key agricultural infrastructure is required on a frequent basis (daily). Walkers, cyclists, horse-riders (WCH): 1) national trails and routes likely to be used for both commuting and recreation that record frequent (daily) use. Such routes connect communities with employment land uses and other services with a direct and convenient WCH route. Little / no potential for substitution. 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 different 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 are expected to increase by 16-25% by 2041 (ONS data); and/or 2) existing housing and land allocated for housing (eg strategic housing sites) covering >1-5ha and / or >30-150 houses. Community land and assets where there is a combination of the following: 1) there is substantial severance between community 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); and 4) the land and assets are used by the majority (>=50%) of the community. Development land and businesses: 1) existing employment sites (excluding agriculture) and land allocated for employment (eg strategic employment sites) covering >1 - 5ha.

Receptor value (sensitivity)	Description
	2) Agricultural land holdings: 3) areas of land in which the enterprise is dependent on the spatial relationship of land to key agricultural infrastructure; and 4) access between land and key agricultural infrastructure is required on a frequent basis (weekly). Walkers, cyclists, horse-riders (WCH): 1) regional trails and routes (eg promoted circular walks) likely to be used for recreation and to a lesser extent commuting, that record frequent (daily) use. Limited potential for substitution; and/or 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 are expected to increase by >6 - 15% by 2041 (ONS data); and/or 2) existing housing and land allocated for housing (eg 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; 2) limited alternative facilities are available at a local level within adjacent communities; 3) the level of use is reasonably frequent (monthly); and 4) the land and assets are used by the majority (>=50%) of the community. Development land and businesses: 1) existing employment sites (excluding agriculture) and land allocated for employment (eg 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; and 2) access between land and key agricultural infrastructure is required on a reasonably frequent basis (monthly). Walkers, cyclists, horse-riders (WCH): 1) public rights of way and other routes close to communities which are used for recreational purposes (eg 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; and/or 2) rights of way for WCH crossing roads at grade with >4000 - 8000 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) DDA 1995 [Ref 2.N] 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 businesses:

Receptor value (sensitivity)	Description
	1) proposed development on unallocated sites providing employment with planning permission/in the planning process. Agricultural land holdings: 1) areas of land which the enterprise is not dependent on the spatial relationship of land to key agricultural infrastructure; and 2) access between land and key agricultural infrastructure is required on an infrequent basis (monthly or less frequent). Walkers, cyclists, 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; and/ or 2) rights of way for WCH crossing roads at grade with <4000 vehicles per day.
Negligible	Private property and housing: 1) 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); and 4) the land and assets are used by the minority (>=50%) of the community. Development land and businesses: 1) N/A. Agricultural land holdings: 1) areas of land which are infrequently used on a non-commercial basis. Walkers, cyclists, horse-riders (WCH): 1) N/A.

Source: Design Manual for Roads and Bridges, LA 112 Population and human health, table 3.11

Magnitude of impact

12.4.26. The magnitude of impact on land use and accessibility has been determined using the criteria presented in Table 12.2 as a guide. These criteria are derived from Table 3.12 of the DMRB LA 112.

Table 12-2: Magnitude of impact

Magnitude of impact (change)	Typical 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)	Typical description
	WCH: >500m increase (adverse) / decrease (beneficial) in WCH journey length.
Moderate	Private property and housing, community land and assets, development land and businesses and agricultural land holdings: 1) partial loss of/damage to key characteristics, features or elements, e.g. partial removal or substantial amendment to access or acquisition of land compromising viability of property, businesses, community assets or agricultural holdings; and/or 2) introduction (adverse) or removal (beneficial) of severe severance with limited / moderate accessibility provision. WCH: >250m - 500m increase (adverse) or decrease (beneficial) in WCH journey length.
Minor	Private property and housing, community land and assets, development land and businesses and agricultural land holdings: 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: >50m - 250m increase (adverse) or decrease (beneficial) in WCH journey length.
Negligible	Private property and housing, community land and assets, development land and businesses and agricultural land holdings: 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: <50m increase (adverse) or decrease (beneficial) in WCH journey length.
No change	No loss or alteration of characteristics, features, elements or accessibility; no observable impact in either direction.

Source: Design Manual for Roads and Bridges, LA 112 Population and human health, table 3.12

Significance of effect

12.4.27. The significance of effect for each element of the land use and accessibility sub-topic has been derived by combining the assigned value (sensitivity) of the receptor with the magnitude of the change (impact) arising from the Proposed Scheme. This is in accordance with the significance matrix set out in DMRB LA 104, Table 3.8.1. The significance matrix is also presented in Table 4-1 of this Environmental Statement in Chapter 4 (Environmental assessment methodology) (TR010039/APP/6.1).

- 12.4.28. Effects which have been evaluated as being of moderate, large or very large significance (beneficial or adverse) are considered to be significant.
- 12.4.29. The matrix has been used to guide the identification and assessment of effects on land use and access. Professional judgement has been applied where required when assigning sensitivity, magnitude and significance of effect using the matrix. Where professional judgement has been applied, reasoning has been explained within the relevant sections of the chapter and are supported by appropriate evidence.

Human health

- 12.4.30. Health is defined by the World Health Organisation (WHO) as ‘a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity’ (WHO, 2019). A qualitative assessment of human health has been undertaken in line with the DMRB LA 112. The assessment considers the change to health determinants as a result of the construction and operation of the Proposed Scheme. Changes to health determinants can affect the health of individuals or communities differently depending on their sensitivity to change.
- 12.4.31. This chapter provides a systematic approach to assess the health effects of the Proposed Scheme. A qualitative approach has been undertaken as it is not possible to numerically quantify the severity or extent of the effects which would give rise to health outcomes.
- 12.4.32. DMRB LA 112 sets out the following data requirements that should be used to determine the health profiles. The data used to establish the health profile of local communities has been taken from Public Health England Local Health profiles (2013 to 2017 and 2017 to 2018) and 2011 Census data (ONS, 2016). This includes:
- Percentage of the community with increased susceptibility to health issues (vulnerable members, e.g. <16 and >65)
 - Percentage of the 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
- 12.4.33. The purpose of health profiling is to establish the potential sensitivity to change of relevant community groups who may be affected by the Proposed Scheme. Data has been collated for the following community wards:

- Wittering (including Glinton and Wittering) (Peterborough City Council)
- Stilton, Folksworth and Wasingley (including Elton and Folksworth and Stilton) (Cambridgeshire County Council)
- Prebendal (North Northamptonshire Council)
- Barnack (Peterborough City Council)

12.4.34. The next step undertaken was to determine the health determinants which are factors that contribute to the health of communities which may be changed as a result of the Proposed Scheme. DMRB LA 112 sets out the following categories to be used to identify the key health determinants for communities:

- access to healthcare facilities
- access to community, recreation and education facilities
- access to green/open space
- existing and predicted levels of air and noise pollution
- landscape amenity
- sources and pathways of potential pollution (eg land/water contamination)
- transport network
- stakeholder consultation

12.4.35. The health determinants have been derived using the categories above to identify health outcomes within affected communities.

Sensitivity

12.4.36. Once the health profiles are established DMRB LA 112 states the sensitivity of local communities (in terms of their sensitivity to change) should be identified as:

- low
- medium
- high

Health Outcomes

12.4.37. DMRB LA 112 does not define the significance of human health effects as '*it is not possible to quantify the severity or extent of the effects which give rise to the outcomes*'. Potential health outcomes during construction and operation use a different methodology to the Land use and accessibility topic. The potential health outcomes have been categorised based on the categories provided in DMRB LA 112 Table 3.32, as shown in Table 12.3 below. Professional judgement has been used to determine the final health outcome, drawing on all the information presented on human health within this chapter.

Table 12-3: Human health outcome categories

Health outcome category	Health outcome description
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

Source: Design Manual for Roads and Bridges, LA 112 Population and human health, table 3.2

Assessment assumptions and limitations

- 12.5.1. Data from 2011, 2013 to 2017 and 2017 to 2018 has been used to establish the health profiles as this is the most recent data available. Whilst some of this data is more than five years old, this is still considered appropriate for the purposes of this assessment as it still meets the data collection requirements outlined in DMRB LA 112.
- 12.5.**
12.5.2. Data in the Census and Public Health England data cover slightly different extents of the wards due to a difference in boundaries. Whilst this means some of the percentages quoted in Table 12.7 may be slightly over-represented, the spatial differences cover a small area and therefore the data is still considered useful for the purposes of this assessment.
- 12.5.3. It has been assumed that community assets within the vicinity of the Proposed Scheme are used by local residents on a regular basis, as Peterborough is located approximately 8.5km to the east of the Proposed Scheme.
- 12.5.4. It has been assumed that community assets, open space and businesses within the wards of Wittering and Stilton, Folksworth and Washingley are essential to and used regularly by residents of these wards. The wards have been reported in line with the Public Health England (2018) ward data. Where changes to the wards have occurred since the 2011 Census data, these have been explained in the assessment.
- 12.5.5. At the time of writing occupier information was not available for four agricultural land areas totalling 0.81 ha. These areas were added following a design updates in May 2021. These agricultural areas are to be temporarily taken during construction and total less than 1 ha. It is not known whether any fixed assets are impacted by the Proposed Scheme but from a high-level review it would appear that lengths of mature hedgerow would be required to be removed.
- 12.5.6. A further 0.35 ha of agricultural is known to belong to one landowner, but the occupier(s) have not been identified. A questionnaire has not been received for

this land as it was assumed that it would be included in consultation responses submitted by the tenants. Contact details for the tenants were not made available at time of writing. It has therefore been assumed that the land is farmed by one tenant, which is covered by the assessment of holding 7. This assumption is considered sufficient for the purposes of this assessment.

Study area

Land use and accessibility

- 12.6.1. The study area for the assessment of impacts on land use and accessibility extends 500m from the Proposed Scheme boundary in line with DMRB LA 112, paragraph 3.6. This has been selected as significant effects are unlikely to occur outside of the 500m study area as a result of the Proposed Scheme. The study area is shown in Figure 12.1 (**TR010039/APP/6.2**).

Human health

- 12.6.2. The study area for human health includes the following community wards which are located within the City of Peterborough City Council, Cambridgeshire County Council and North Northamptonshire Council:
- Wittering (including Glinton and Wittering)
 - Stilton, Folksworth and Washingley (including Elton and Folksworth and Stilton)
 - Prebendal
 - Barnack
- 12.6.3. Census data has been included for the wards 'Glinton and Wittering' and 'Elton, Folksworth and Washingley'. To ensure the equivalent spatial areas have been included in the data from Public Health England, data for the wards 'Wittering and Stilton' and 'Folksworth and Washingley' has been included, as the wards have been divided differently in the two different data sets. This has caused a limitation on the data as whilst the required areas are covered, there are some additional areas which have been included. This study area is based on the extent and characteristics of the Proposed Scheme, and the degree to which these communities are likely to be affected by the Proposed Scheme, in line with paragraph 3.23 of DMRB LA 112.

Baseline conditions

Land use and accessibility

Private property and housing

- 12.7.1. There are approximately 370 residential properties within the study area. These are concentrated in the villages of Wansford, Sutton and Thornhaugh.

12.7.

Residential areas are located near to the Proposed Scheme, including the village of Wansford to the south-west and Sutton to the south-east. The small village of Thornhaugh is also located west of the A1 (Great North Road), north-west of the Proposed Scheme. The residential village of Upton is located outwith the Proposed Scheme boundary, however it is still considered as part of the assessment as journey length changes are predicted to residents of this village.

- 12.7.2. There are three residential properties within the Proposed Scheme boundary: two properties to the north of the A47, including Heath House (a former railway house), Old Station House (which is a derelict property), within the Peterborough City Council boundary, and Deep Springs which is located to the south of the A47 within Cambridgeshire. Old Station House is at risk of demolition due to the Proposed Scheme.
- 12.7.3. There are a number of more isolated residential properties and farm holdings in the vicinity of the Proposed Scheme along the east of the A1 (Great North Road) within the Peterborough City Council boundary. These include Abbott's Cottages, which have direct access onto the A1, and houses located near Windgate Way. Four properties are located along the A1 (Great North Road), north of Windgate Way. Access to these properties is obtained via the A1. Properties in Wansford can be accessed from the A1 via Peterborough Road.
- 12.7.4. The Peterborough City Council Local Plan, Peterborough Core Development Strategy and the Cambridgeshire City Council Local Plan show there to be no areas allocated for residential development within 500m of the Proposed Scheme.
- 12.7.5. No other land, buildings or infrastructure used for residential housing have been identified within the study area.
- 12.7.6. The sensitivity of the key areas of housing in the local planning authority area of Peterborough are considered High as the ONS data was reviewed and the number of households are expected to increase by 16-25% by 2041 (refer to the criteria in DMRB LA 112 table 3.11). The sensitivity of the key areas of housing in the local planning authority area of Cambridgeshire are considered Medium as the ONS data was reviewed and the number of households are expected to increase by >6-15% by 2041.

Community land and assets

- 12.7.7. Wansford Pasture and Standen's Pasture nature reserve is located within the study area to the south-west of the Proposed Scheme. These areas of community land are not anticipated to be affected by the Proposed Scheme and are therefore not considered further in this assessment. Wansford picnic area is located to the south of the A47, north of the River Nene. Consultation with

Wansford Parish Council has determined that the picnic area has been closed for approximately two years due to incidents of anti-social behaviour. It is therefore not included in this assessment. The nearest hub of community assets is located in Peterborough, to the east of the Proposed Scheme. There are no other areas of community land (public open space, village greens, allotments, sports pitches) within the study area.

12.7.8. Community assets within the study area include Sacrewell Farm Centre, located to the east of the A1. This is a historic farm that hosts events and has grounds for camping and a caravan site. The following community assets are located within the study area, mostly located in Wansford:

- Wansford Pharmacy, approximately 550m west of the Proposed Scheme boundary
- Wansford Surgery, approximately 550m west of the Proposed Scheme boundary
- Wansford Post Office, approximately 500m south-west of the Proposed Scheme boundary
- Thornhaugh Parish Church, approximately 250m north of the Proposed Scheme boundary
- Parish Church of Saint Mary the Virgin Wansford, approximately 300m from the Proposed Scheme boundary
- St Michael and all Angels Church (Sutton), approximately 450m south of the Proposed Scheme boundary
- Church of Sant John the Baptist (Stibbington), approximately 770m south of the Proposed Scheme boundary

12.7.9. The closest primary schools are located in Wittering (approximately 2.2km to the north of the Proposed Scheme), Ailsworth (approximately 1.9km to the east of the Proposed Scheme) and Nassington (approximately 3.4km to the south of the Proposed Scheme)

12.7.10. The villages of Wansford and Sutton are approximately 3.2km apart linked by the existing A47. Residents of the villages can access community assets in each village.

12.7.11. The sensitivity of community assets in Wansford and Sacrewell Farm Centre is classified as **high**, as it is likely that the facilities would be used frequently (weekly) and alternative facilities are only available in the wider planning authority area. The sensitivity of the Wansford Picnic Area has been classified as **Low**, as the level of use is infrequent and used by the minority ($\geq 50\%$) of the community.

Development land and businesses

12.7.12. There are no areas allocated for development within the study area.

12.7.13. There are a number of businesses located within the study area, these include:

- The Petrol Filling Station, adjacent to the south of the Proposed Scheme boundary
- The Chimes Hotel, approximately 40m south of the Proposed Scheme boundary
- The Old Rectory, approximately 200m west of the Proposed Scheme boundary
- [REDACTED], approximately 170m west of the Proposed Scheme boundary
- James Driver Training, approximately 140m west of the Proposed Scheme boundary
- Harris McCormack Architects, approximately 40m west of the Proposed Scheme boundary
- Wansford Cosmetic, approximately 370m west of the Proposed Scheme boundary
- The Haycock Manor Hotel, approximately 340m south-west of the Proposed Scheme boundary
- The Paper Mills, approximately 420m south-west of the Proposed Scheme boundary
- Vow Bridal Gallery, approximately 400m south-west of the Proposed Scheme boundary
- Wansford Country lounge B&B, approximately 370m south-west of the Proposed Scheme boundary
- Wansford Airport taxi service, approximately 490m south-west of the Proposed Scheme boundary
- Wansford Cricket Club Ground, approximately 100m south-west of the Proposed Scheme boundary
- Processors & Growers, approximately 25m north of the Proposed Scheme boundary
- Stamford and Heavenly Chocolates, approximately 400m north of the Proposed Scheme boundary
- Origin 8 Deli Cafes, approximately 490m north of the Proposed Scheme boundary
- Sacrewell Heritage Museum, approximately 245m north of the Proposed Scheme boundary

12.7.14. The sensitivity of all businesses in the study area are assessed as **medium** as individually, these cover an area less than 1 ha.

Agricultural land holdings

12.7.15. Defra farming statistics for the East of England indicates that farmland is generally owner occupied with some areas occupied on short term tenancy agreements by neighbouring owner occupiers (Defra, 2020). Four of the agricultural holdings are tenanted, the remaining two are owner occupied.

12.7.16. Agricultural questionnaires were sent out to nine occupiers to facilitate the assessment of the impact on agricultural holdings. Three occupiers have been removed from the impact assessment. One questionnaire returned from a landowner confirmed the land was unfarmed and held for commercial development, therefore did not need to be assessed further. Two landowners did not respond, however further investigation showed these were private gardens. Of the seven agricultural holdings potentially impacted by the Proposed Scheme, five returned questionnaires, one of which was only partially completed. High level assessment methods were used where there were gaps in information received. This was achieved using publicly available information, standard industry figures and professional knowledge. Sources of publicly available information agri-environment scheme layers on MAGIC, Google Earth, Defra statistics pages and the Defra CAP payments website.

12.7.17. Agricultural land holdings within the Proposed Scheme boundary are shown on Figure 12.4 (**TR010039/APP/6.2**). A review of the area using Google Earth shows that the farmsteads and major agricultural infrastructure, such as internal tracks and livestock handling facilities, are in most cases set back from the existing roads (A47 and A1). The seven agricultural holdings identified that could potentially be affected by the Proposed Scheme appear to be a mixture of arable and livestock grazing units. Based on the criteria derived from Table 3.11 of DMRB LA 112, three of the seven agricultural holdings have been identified as being of very **high sensitivity** due to the predominantly grassland use. These require daily access if used for livestock grazing. Four of the agricultural holdings are used for arable and/or vegetable production. These require at least monthly access; which would indicate a **moderate** sensitivity; however, access would be required more frequently during peak times including harvest and sowing.

Table 12-4: Sensitivity of agricultural land holdings

Farm Reference	Land use	Land dependent on spatial relationship to infrastructure	Frequency of access required	Sensitivity
1	Grassland / Arable / Fruit & Vegetables	Yes – existing access to A1 and A47 would be re-routed.	Daily	Very High
2	Grassland	No	Daily	Very High
3	Arable	No	At least monthly	High
4	Arable	No	At least monthly	High
5	Grassland	No	Daily	Very High
6	Arable	No	At least monthly	High
7	Arable	No	At least monthly	High

Walkers, cyclists and horse-riders

12.7.18. The existing WCH facilities in the study area are summarised in Table 12.5 and shown in Figure 12.3 (**TR010039/APP/6.2**). They comprise PRoW, (namely footpaths and bridleways), permissive routes and footways provided as part of the highway network.

Table 12-5: WCH facilities in the study area

Location Ref (Figure 12.3) (TR010039/APP/6.2)	PRoW Reference (PCC) / Permissive Route Reference (PCC) / Location	Description
1	Wansford 1 (ID: 455)	The footpath runs from Old Leicester Road to Old North Road in an easterly direction for approximately 100m. It passes through a residential area.
2	Wansford 2 (ID: 456)	The footpath runs from Bridge End road in a southerly direction for approximately 93m connecting to the PRoW Footpath PG1 within Northamptonshire. The route is adjacent to Wansford Bridge.
3	Wansford 3 (ID: 458, 783 and 457)	The footpaths start to the south of Old Leicester Road at the boundary with Northamptonshire as a continuation to PRoW PG19. The route heads north through a field until it intersects with Old Leicester Road. It continues to the north of Old Leicester Road through another field before intersecting with the A47. To the north of the A47, it continues along a field boundary connecting with PRoW Thornhaugh 5 (ID: 425).
4	Wansford 4 (ID: 459)	The footpath runs from the A47 in a south-easterly direction for approximately 180m until reaching the River Nene where it connects to footpath Wansford Nene Way Permissive 4 and footpath Sutton 1. The footpath runs through open fields and a small wooded area.
5	Wansford Annual Maintenance 113 (ID: 460 & 785)	This permissive footpath runs from the A47 junction with the unnamed access road leading to Wansford Picnic Area in an easterly direction for approximately 200m before merging with permissive footpath Wansford Nene Way Permissive 4 (ID: 784) to the east to the south of the petrol filling station.
6	Wansford Hereward Way Permissive 2 (ID: 786)	Hereward Way Permissive 2 footpath runs between the southern side of the A47 and permissive footpaths Wansford Annual Maintenance 113 (ID: 460) and Wansford Nene Way Permissive 1 (ID: 574). The route runs along the first 25m of the unnamed access road leading to the Wansford Picnic Area.
7	Wansford Hereward Way Permissive 3 (ID: 787)	Hereward Way Permissive 3 footpath runs northwards from the A47 along the private road leading serving Sacrewell Farm and connects to footpath Thornhaugh Permissive 1 prior to reaching the farm.
8	Wansford Nene Way Permissive 1 (ID: 574)	This permissive footpath runs from Peterborough Road in Wansford in an easterly direction for approximately 620m. It passes beneath the A1 and runs along northern edge of the Wansford Picnic Area until it reaches Wansford Hereward Way Permissive 2 (ID: 786) and Wansford Annual Maintenance 113 (ID: 460), 25m south of the A47.
9	Wansford Nene Way Permissive 4 (ID: 784)	This permissive footpath runs along the northern bank of River Nene, to the south of the A47, between permissive footpath Wansford Annual Maintenance 113 (ID: 785) in west; and the junction of PRoW Wansford 4 (ID: 459) and PRoW Sutton 1 (ID: 392) in the east.

Location Ref (Figure 12.3) (TR010039/APP/6.2)	PRoW Reference (PCC) / Permissive Route Reference (PCC) / Location	Description
10	Sutton 1 (ID: 392 & 393)	This footpath starts at the end of PRoW Wansford 4 (ID: 459) south of the A47 and runs in a southerly direction to the east of the River Nene for approximately 1km until it reaches Sutton.
11	Sutton 3 (ID: 395)	This bridleway starts at Nene Way in Sutton and runs in an easterly direction for approximately 640m and connects to bridleway PRoW Ailsworth 3 (ID: 4) and an onward connection to Peterborough Road.
12	Sutton 4 (ID: 396 & 397)	The footpath starts at eastern end of Graeme Road in Sutton and runs in an easterly direction for approximately 750m and connects to PRoW Ailsworth 6 (ID: 9).
13	Sutton 5 (PRoW ID: 903, 399 & 398/Permissive bridleway ID: 904, 522 & 523)	The bridleway starts at Sutton Heath Road, to the north of its junction with Langley Bush Road, and runs in a north-westerly direction for approximately 490m connecting to bridleway PRoW Thornhaugh 8 (ID: 430). There are two routes, one a PRoW and one a permissive route. Both routes pass through fields.
14	Sutton Nene Way Permissive 1 (ID: 520)	The permissive footpath starts at Nene Way in Sutton and runs along Lovers Lane in a southerly direction for approximately 175m.
15	Sutton Annual Maintenance 96 (ID: 400)	This footpath starts at the end of Nene Way in Sutton and runs in a westerly direction for approximately 130m until it reaches the River Nene.
16	Sutton Annual Maintenance 111 (ID: 454)	This permissive bridleway starts at Peterborough Road west of Ailsworth runs in a northerly direction for approximately 90m and connects to permissive bridleway Upton Annual Maintenance 110 (ID: 453) which runs eastwards to the south of the existing A47 alignment
17	Ailsworth 3 (ID: 4)	The PRoW bridleway starts at the end of PRoW Sutton 3 (ID: 395) runs in an easterly direction for approximately 145m and ends at Peterborough Road
18	Ailsworth 6 (ID: 650, 651, 652, 659, 546 & 397)	A series of footpaths, some sections of which are PRoW and some permissive that link between PRoW Sutton 4 and Peterborough Road. The footpaths run along a mixture of field boundaries and tracks.
19	Upton Annual Maintenance 110 (ID: 453)	This permissive bridleway forms a continuation of permissive bridleway Sutton Annual Maintenance 111 (ID: 454) and runs in an easterly direction to the south of the A47 alignment for approximately 300m and connects to permissive bridleway Ailsworth Annual Maintenance 1 (ID: 516). This permissive bridleway then continues eastwards as far as Helpston Road in Ailsworth.

Location Ref (Figure 12.3) (TR010039/APP/6.2)	PRoW Reference (PCC) / Permissive Route Reference (PCC) / Location	Description
20	Thornhaugh 1 (ID: 415, 416 & 417)	The footpath starts at Russell Hill and continues north along a track before heading westerly along a field edge and then north along the edge of a wooded area to join PRoW Wittering 4 (ID: 467).
21	Thornhaugh 5 (ID: 425)	This footpath is a continuation of PRoW Wansford 3 (ID: 457, 783 & 458)). The route continues north along the field boundary and connects with Meadow Lane in Thornhaugh.
22	Thornhaugh 6 (ID: 427)	This footpath runs northwards from the eastern end of Windgate Way [where it connects to bridleway Thornhaugh 8 (ID: 669)] to PRoW Wittering 8 (ID: 473). The route follows a mixture of tracks and field boundaries
23	Thornhaugh 7 (ID: 428)	This footpath runs from Russell Hill in a south-eastern direction for approximately 243m until it reaches a wooded area adjacent to the A1. The route passes through a field.
24	Thornhaugh 8 (ID: 429, 430 & 669)	This bridleway starts on Windgate Way at the junction with the A1 and runs in an easterly and south-easterly direction around Sacrewell Farm before running easterly again and joining PRoW Sutton 5. The route mainly follows access tracks with the easternmost section following a field boundary.
25	Thornhaugh Permissive 1 (ID: 537)	This footpath runs in a southerly direction to the east of Sacrewell Farm for approximately 75m providing a connection between PRoW Thornhaugh 8 (ID: 429, 430 & 669) and permissive footpath Wansford Hereward Way Permissive 3 (ID: 787). It follows an access track.
26	Northamptonshire PG1	This footpath is a continuation of footpath Wansford 2 (ID: 456) and runs in a south / south-westerly direction. to Main Street in Yarwell, approximately 80m to the east of the church. The route predominantly follows field footpaths.
27	Northamptonshire PG19	This footpath is a continuation of footpath Wansford 3 (ID: 457, 783 & 458)) and runs in a south / south-westerly direction to join PRoW PG6 at Wansford Quarter in Old Sulehay Forest
28	Wansford	A footway is provided on the western frontage of Old North Road (A6118) in a southerly direction between the A47 and a point opposite its junction with Black Swan Spinney. From here, the footway switches to the eastern frontage as far as its junction with Peterborough Road. A section of footway is also provided on the western frontage of Old North Road between its junction with Peterborough Road and a point opposite its junction with Nene Close. These footways lead to an underpass under the A47 connecting to the footway leading to the cul-de-sac section of Old North Road to the north of the A47 and adjacent to the A1
29	Wansford	Footways are provided on both frontages of Peterborough Road that lead to a footway on the A1 on the western frontage of the northbound carriageway. The also provide a connection to Wansford Nene Way Permissive 1 which passes under the A1.
30	Wansford	Footways are provided on the A1 on the western frontage of the northbound carriageway. The footway on the A1 travels as far as the overbridge of the A47 to the north and link to a footway on the A6118 slip road to the south.

Location Ref (Figure 12.3) (TR010039/APP/6.2)	PRoW Reference (PCC) / Permissive Route Reference (PCC) / Location	Description
31	Wansford	Short sections of cycleway are provided at both of the A47/ A1 roundabouts to allow cyclists to leave the carriageway, negotiate the respective roundabout and then re-join the carriageway.
32	Sutton	There are two short sections of footway on Old Peterborough Road. One section on the western frontage between the A47 Sutton Roundabout and the junction with Nene Way. The second section is on the northern frontage to the east of Nene Way which provides access to the eastbound bus stop.
33	A47 / Upton Road / Peterborough Road roundabout	The roundabout provides a crossing point on the A47 for promoted advisory cycle routes in the area

12.7.19. The receptors and their sensitivity are summarised in Table 12-6 below. The assigned sensitivity has been based on Table 13.2 in DMRB, professional judgement and experience of undertaking similar assessments for similar schemes.

Table 12-6: Sensitivity of WCH routes to changes in journey length

Location Ref (Figure 12.3) (TR010039/APP/6.2)	Sensitivity	Reasoning
Wansford 1 (ID: 455)	Medium	The footpath runs between residential areas on Old Leicester Road and Old North Road in Wansford. It would mainly be used for recreational purposes for which an alternative route can be taken. No usage surveys were undertaken for this footpath.
Wansford 2 (ID: 456)	High	The footpath forms part of a route between Wansford and Yarwell, which follows a field boundary. It is likely to be used mainly for recreational purposes especially since it forms part of the prescribed route of the Nene Way. No usage surveys were undertaken for this footpath.
Wansford 3 (ID: 457, 783 & 458)	Medium	This footpath, in conjunction with other footpaths in the area, provides a route between Yarwell Road within the Northamptonshire boundary in the south and Thornhaugh village in the north. The route comprises of predominantly field footpaths. Usage surveys recorded only 19 movements during the survey period, which suggests that the route is used for leisure purposes.
Wansford 4 (ID: 459)	Medium	This footpath provides a link between the small layby on the A47 alignment and the permissive routes along the north side of the River Nene. The route passes through a field and a wooded area and is likely used for recreational purposes. No usage surveys were undertaken for this footpath.

Location Ref (Figure 12.3) (TR010039/APP/6.2)	Sensitivity	Reasoning
Wansford Annual Maintenance 113 (ID: 460 & 785)	High	This permissive footpath provides a link between the private access road leading to the Wansford Picnic Area and the permissive route along the River Nene. The surveys of usage recorded 592 movements using this permissive route [traveling to and from Wansford Nene Way Permissive 1 (ID: 574)] during the seven day period. The level of usage was relatively even for each day of the survey with an average 90 movements per day. The majority of users were pedestrians although there were a number of cycle movements (around 5%). The results suggest that this permissive route is an important leisure route for local residents in Wansford and Sutton.
Wansford Hereward Way Permissive 2 (ID: 786)	High	This permissive footpath provides a link across the A47 between the permissive footpath leading from Sacrewell Farm and the permissive routes along the River Nene. The surveys of usage recorded 113 movements crossing the A47 of which all were either lone pedestrians or cyclists. The results suggest that this permissive route is an important leisure route for both pedestrians and cyclists and the route towards Sacrewell Farm is also an important route for cyclists.
Wansford Hereward Way Permissive 3 (ID: 787)	High	This permissive route, in conjunction with other permissive routes in the area, lead to a crossing point of the A47. As indicated above for Wansford Hereward Way Permissive 2, the surveys of usage suggest that this permissive route is an important leisure route for both pedestrians and cyclists when accessing Sacrewell Farm.
Wansford Nene Way Permissive 1 (ID: 574)	High	This permissive footpath passes beneath the A1 and provides a link between Peterborough Road in Wansford and the permissive footpath to the north of the River Nene. The surveys of usage recorded 592 movements using this permissive route during the survey period. The level of usage was relatively even for each day of the survey with an average 90 movements per day. The majority of users were pedestrians although there were a number of cycle movements (around 5%). The results suggest that this permissive route is an important leisure route for local residents in Wansford and Sutton.
Wansford Nene Way Permissive 4 (ID: 784)	High	This permissive route runs along the northern bank of River Nene and forms part of the route between Wansford and Sutton villages in conjunction with the other routes in the area. The route passes through fields and along the river edge and is used for recreational purposes. Although no usage surveys were undertaken for this footpath, surveys for the linking route indicate that this permissive route is an important leisure route for local residents in Wansford and Sutton.
Sutton 1 (ID: 392 & 393)	High	This footpath forms the continuation of footpath Wansford 4 and permissive route Wansford Nene Way Permissive 4. The route runs along the eastern bank of the River Nene before continuing through adjoining fields leading into Sutton. The surveys of usage recorded 130 movements using this route during the seven days. The majority of users were pedestrians although there were a small number of cycle movements (around 2%) even though the route is a footpath. The results suggest that this permissive route is an important leisure route for local residents in Sutton.
Sutton 3 (ID: 395)	Medium	This bridleway forms a link between Nene Way (at Sutton) and Peterborough Road (at Ailsworth), in conjunction with bridleway Ailsworth 3 and runs along an unmade track between these points. It is used for recreational uses. The surveys recorded low usage with only 34 movements throughout

Location Ref (Figure 12.3) (TR010039/APP/6.2)	Sensitivity	Reasoning
		the survey period, the majority of which were dog walkers and lone pedestrians. However, four horse riders were also recorded during the survey period.
Sutton 4 (ID: 396 & 397)	Medium	This footpath provides a link between Sutton and Peterborough Road, in conjunction with footpath Ailsworth 6. The route runs through a mixture of fields and along field boundaries and is likely used for recreational purposes. No usage surveys were undertaken for this route.
Sutton 5 (PRoW ID: 903, 399 & 398/Permissive bridleway ID: 904, 522 & 523)	Medium	This bridleway provides a link between Sutton Heath Road and bridleway Thornhaugh 8 which runs to Sacrewell Farm to the west. Both routes run across fields. Usage surveys recorded very little usage of the bridleway with only 10 movements during the survey period.
Sutton Nene Way Permissive 1 (ID: 520)	Medium	This permissive route follows Lovers Lane in Sutton and is likely used for recreational purposes since it connects to another footpath to the south for onward connections to Sibson. No usage surveys were undertaken for this footpath.
Sutton Annual Maintenance 96 (ID: 400)	Medium	This permissive route runs west from the end of Nene Way to the River Nene in Sutton and is likely used for recreational purposes. No usage surveys were undertaken for this footpath.
Sutton Annual Maintenance 111 (ID: 454)	Medium	This permissive route, in conjunction with other routes in the area, forms part of the route that runs along the southern side of the A47 between Peterborough Road (at Ailsworth) and Helpston Road. This route is designated as a horse route and as such, is likely used by equestrians. No usage surveys were undertaken for this route.
Ailsworth 3 (ID: 4)	Medium	This bridleway forms a link between Nene Way (at Sutton) and Peterborough Road (at Ailsworth) in conjunction with bridleway Sutton 3 and runs along an unmade track between these points. The surveys of usage recorded low usage of this route with only 34 movements recorded, the majority of which were dog walkers and lone pedestrians undertaking recreational trips. However, four horse riders were also recorded during the survey period.
Ailsworth 6 (ID: 650, 651, 652, 659, 546 & 397)	Medium	These footpaths provide a link between Sutton and Peterborough Road, in conjunction other footpaths in the area. The footpaths run along a mixture of field boundaries and tracks and are likely used for recreational purposes. No usage surveys were undertaken for these routes.
Upton Annual Maintenance 110 (ID: 453)	Medium	This permissive route, in conjunction with other routes in the area, forms part of the route that runs along the southern side of the A47 between Peterborough Road (at Ailsworth) and Helpston Road. This route is designated as a horse route and as such, is likely used by equestrians. No usage surveys were undertaken for this route.
Thornhaugh 1 (ID: 415, 416 & 417)	Medium	This footpath runs northwards from the village of Thornhaugh linking to other footpaths in the area. The footpath runs along a mixture of track and field boundary and is likely used as a recreational route. No usage surveys were undertaken for this footpath.
Thornhaugh 5 (ID: 425)	Medium	This footpath is a continuation of footpath Wansford 3 and provides a link between the village of Thornhaugh, the A47 and Old Leicester Road to the west of Wansford. Although no usage surveys were undertaken for this route, they were undertaken for the connecting footpath, Wansford 3. The surveys of usage for Wansford 3 recorded 19 movements during the survey period. The results

Location Ref (Figure 12.3) (TR010039/APP/6.2)	Sensitivity	Reasoning
		suggest that the route is likely used for leisure trips between the villages of Thornhaugh and Wansford.
Thornhaugh 6 (ID: 427)	Medium	This footpath provides a connection between bridleway Thornhaugh 8 and footpath Wittering to the north of Sacrewell Farm. The route follows a mixture of tracks and field boundaries and is likely used for recreational purposes. No usage surveys were undertaken for this footpath.
Thornhaugh 7 (ID: 428)	Low	This footpath passes through a field and provides a connection between Russell Hill and a wooded area adjacent to the western boundary of the A1. The route does not link to any other routes in the area and is therefore does not offer a meaningful route for either recreational or utility purposes. No usage surveys were undertaken for this footpath.
Thornhaugh 8 (ID: 429, 430 & 669)	Medium	This bridleway starts at the junction with the A1 in the west and runs past Sacrewell Farm before joining bridleway Sutton 5 in the east. The route follows sections of track from the A1 to the farm before following a field edge to the east of the farm buildings. No usage surveys were undertaken for this route. However, usage surveys were undertaken for bridleway Sutton 5. These surveys recorded very little usage of the bridleway with only 10 movements recorded during the survey period.
Thornhaugh Permissive 1 (ID: 537)	High	This route provides a link between bridleway Thornhaugh 8 and permissive route Wansford Hereward Way Permissive 3. The route follows the existing track adjacent to Sacrewell Farm. The route is used for recreational purposes. No usage surveys were recorded for this route. However, survey results for permissive route Wansford Hereward Way Permissive 3 suggest that this permissive footpath is an important leisure route for pedestrians and it is also used by cyclists.
Northamptonshire PG1	High	This footpath is a continuation of footpath Wansford 2 and provides a link between Wansford and Main Street in Yarwell. The route predominantly follows field boundaries and is likely used for recreational purposes as this is the prescribed route of the Nene Way. No usage surveys were undertaken for this footpath.
Northamptonshire PG19	Medium	This footpath provides a connection between Yarwell Road (to the west of Wansford) and the village of Thornhaugh, in conjunction with bridleway PG6 to the south and footpath Wansford 3 and footpath Thornhaugh 5 to the north. Usage surveys for this route recorded 19 movements during the survey period. These results suggest that the route is used for leisure trips between the villages of Wansford and Thornhaugh.
Wansford – Footways on Old North Road	Very High	These footways in conjunction with the subway under the A47 provide access between existing residential properties and local amenities within Wansford village. There is no potential for substitution of these facilities. Usage surveys for the subway recorded 100 movements during the survey period, the majority of which were pedestrians. The other users were cyclists who are required to dismount to use the subway.
Wansford – Footways on Peterborough Road	Very High	These footways provide access between existing residential properties and local amenities within Wansford village. They also provide a connection to the Wansford Picnic Area and routes along

Location Ref (Figure 12.3) (TR010039/APP/6.2)	Sensitivity	Reasoning
		the River Nene via the permissive route Wansford Nene Way Permissive 1 which passes beneath the A1. There is no potential for substitution of these facilities. Usage surveys undertaken for the permissive route recorded 91 movements during the survey period, the majority of which were pedestrians, with the other users being cyclists.
Wansford – Footways on A1	Low	The footways provided on the western frontage of the A1, a high-speed strategic route, do not offer a meaningful route for either utility or for recreation trips. Additionally, they do not provide access to any amenities within Wansford. No usage surveys were undertaken for these facilities.
Wansford – Cycle facilities at a1 / A47 roundabouts	Medium	These short sections of cycleway allow cyclists to leave the carriageway, negotiate the respective roundabout and then re-join the carriageway. Usage surveys undertaken at the western roundabout recorded 13 movements by cyclists. The surveys also recorded a number of pedestrian movements.
Sutton – Footways on Peterborough Road	Low	The two short sections of footways on Peterborough Road are remote from the villages of Sutton and Ailsworth and are provided due to a bus stop being located at this point. Usage surveys recorded very few pedestrian movements.
A47 / Upton Road / Peterborough Road roundabout	High	The roundabout provides a crossing point on the A47 for cyclists between the advisory cycle routes on Upton Road and Peterborough Road. Usage surveys recorded 103 cycle movements across the A47 during the survey period.

Human Health

Health Profiles

- 12.7.20. All communities within the study area (Glington and Wittering, Elton and Folksworth, and Stilton Prebendal and Barnack wards) are considered to have a **high** sensitivity to change. This approach is in line with DMRB LA 104, which states that environmental assessments should be undertaken using a realistic 'worst case' scenario. Within each community there would be varying levels of sensitivity to change across different individuals, as some would be more vulnerable than others. In the absence of evidence to suggest that the communities are less sensitive to change, we consider this precautionary approach to be most appropriate for the purposes of this assessment.
- 12.7.21. The data used to establish the health profiles of the Glinton and Wittering, Elton and Folksworth, and Stilton, Prebendal and Barnack wards is presented in Table 12.7, in comparison to the national average.
- 12.7.22. Across Peterborough the population is estimated to be 78,777 (Census, 2011). The Cambridgeshire and Peterborough Joint Strategic Needs Assessment Core dataset (2020) states that Cambridgeshire and Peterborough have recently experienced population increases and this is expected to continue to 2036. Table 12.7 shows the ward with the highest population in the study area to be Wittering.
- 12.7.23. The census data shows all wards to have a lower percentage of their populations with general health of bad or very bad than the national average. The percentage of the population with limiting long term illnesses or disability for all wards is also lower than the national average. Income-deprived households in all wards are lower than the national average.
- 12.7.24. The data shows all wards aside from Prebendal ward (lower) to have the same or a higher number of emergency hospital admissions for COPD as a percentage of all hospital admissions than the national average. The data shows deaths from respiratory diseases as a percentage of all deaths to be higher than the national average for all wards, aside from Barnack which is lower.
- 12.7.25. The data shows life expectancy for females to be higher than the national average in all wards aside from Barnack (lower) and for males to be higher than the national average in all wards.
- 12.7.26. This data (Table 12.7) shows variation across communities in terms of health indicators. Although generally health indicators are better for the wards compared to the national average, deaths from respiratory diseases are notably higher than the national average. Therefore, for the purposes of this assessment, all three communities are considered to be of **high** sensitivity.

Table 12-7: Health profiles for Glinton and Wittering (Wittering), Elton and Folksworth, and Stilton (Stilton, Folksworth and Washingley), Prebendal and Barnack wards

Local Health Indicator	Wards (communities within the study area)					England
	Glinton and Wittering	Elton and Folksworth	Stilton	Prebendal	Barnack	
Population	7233	2667	3091	2142	2876	53,012,456
Population aged under 16 (%)	20.14%	16.6%	20%	19%	19%	18.9%
Population aged over 65 (%)	12.3%	20.1%	14%	19%	23%	16.3%
Income deprivation (people living in income-deprived households as % of population)	15.8%	19.7%	17.5%	17.7%	18%	23.9%
General health - bad or very bad (%)	3.01%	3.8%	3.4%	3.4%	3%	5.5%
Limiting long term illness or disability (%)	12.3%	14.7%	13%	14.6%	14%	17.6%
Local Health Indicator	Wittering	Stilton, Folksworth and Washingley		Prebendal	Barnack	England
Public Health England Fingertips- Local Health						
Emergency hospital admissions for Chronic Obstructive Pulmonary Disease Standard Admission Ratio (SAR) Data 2013/14-2017/18	28 (2% of total admissions for all causes, any age)	80 (3.2% of total admissions for all causes, any age)		0.9%	2%	613,747 (2% of total admissions for all causes, any age)
Deaths from respiratory diseases, all ages, all persons Standardised Mortality Ratio (SMR)	12 (18% of total deaths for all causes, any age)	42 (18% of total deaths for all causes, any age)		22%	12%	335,078 (14% of total deaths for all causes, any age)
Life expectancy at birth - males, 2016-18 (years)	81.4	84		82.6	82.1	79.5

Local Health Indicator	Wards (communities within the study area)					England
	Glington and Wittering	Elton and Folksworth	Stilton	Prebendal	Barnack	
Data 2013-2017						
Life expectancy at birth - females, 2016-18 (years) Data 2013-2017	87.3	87.1		85.9	82.6	83.1

Health determinants

12.7.27. The health determinant categories as set out in DMRB LA 112 have been used to gather information on the communities/wards presented in Table 12.8. These determinants reflect the physical and social aspects of the environment in which the three communities are situated that contribute towards their general health. These health determining factors are therefore used, along with the health profile data, to predict the likely health outcomes of the Proposed Scheme on the communities.

12.7.28. Information gathered during the 2017 consultations relating to health is provided in Table 12.9).

Table 12-8: Health determinants for Glington and Wittering, Elton and Folksworth, and Stilton Prebendal and Barnack wards

Health determinant categories	Health determinants (Glington and Wittering), Elton and Folksworth, and Stilton, Prebendal and Barnack wards)
The location and type of community, recreational and education facilities	Community assets, healthcare facilities and green/ open space are identified in Figure 12.1 (TR010039/APP/6.2) and considered under the land use and accessibility sections within this chapter. These have been taken into account in identifying the likely health outcomes.
The location of green / open space	Wansford Surgery had 7,824 patients registered in April 2019 ⁴ and is the only surgery within the area.
The location of healthcare facilities	There are community facilities and areas of community land within the human health study area wards, which lie outside the land use and accessibility study area, these are detailed below. Within the Stilton, Folksworth and Washingley ward there are additional community facilities and areas of community land. Those located within a close proximity of the Proposed Scheme include Church of St John the Baptist, Elton Post Office, Church of St Michael (Chesterton). There are no community facilities or healthcare facilities located in the village of Water Newton. Within the wider ward there are additional facilities however these are unlikely to be impacted by the Proposed Scheme due to distance and catchment areas for those using them. Within Prebendal ward, Wansford Pharmacy is located to the north of the ward and there are some community facilities located in Nassington, including Nassington, St Mary the Virgin and All Saints Church, and a Veterinary Surgery in Yarwell. There is a village hall located within Woodnewton and a village hall located in Fotheringhay.

⁴ Peterborough City Council, (2019) Local Health Profiles for the affected Primary Care Networks

Health determinant categories	Health determinants (Glington and Wittering), Elton and Folksworth, and Stilton, Prebendal and Barnack wards)
	Within the Wittering ward there are areas of green/ open space including Bedford Purlieus Woods and Collyweston Great Wood and Easton Hornstocks National Nature Reserve. Facilities within Wittering include Wittering Primary School, Wittering Allotment Gardens, and John the Baptist C of E Church is located within Upton. Additional facilities within Wittering are included in the land use and accessibility assessment. Facilities within Barnack ward include Barnack CE Primary School, Barnack Allotment Gardens, St Andrew's Church (Ufford). Community facilities within Helpston and north of this area are not anticipated to be impacted by the Proposed Scheme due to distance. Community facilities within Glinton and Wittering ward include those in Ailsworth and Castor (Ailsworth Medical Centre, Castor and Ailsworth Cricket Ground, The Church of Kyneburgha, Castor CE Primary School, and facilities in Malholm such as Royal Mail Post Box and St Mary the Virgin Church Malholm. Castor Hanglands National Nature Reserve is located within Glinton and Castor ward. Facilities further north in Glinton are not considered to be impacted by the Proposed Scheme due to distance.
Outline spatial characteristics of the transport network and usage in the area including the surrounding road network, PRoW, cycle ways, non-designated public routes and public transport routes.	The transport network for vehicle travellers surrounding the Proposed Scheme consists predominantly of local roads surrounding the existing A47. Usage data for the WCH facilities in the vicinity of the Proposed Scheme are provided in Table 12.5. The impact on health for users of PRoW are assessed within the air quality, noise and landscape sections, where an impact has been identified within the ES chapters (TR0010039/APP/6.1). There is a network of bus routes surrounding the Proposed Scheme. However, due to the minimal impact on bus services, other than a potential beneficial impact due to congestion relief for all highway traffic as a result of the Proposed Scheme, these have been scoped out of further assessment.
Air quality management areas and ambient air quality	There are no AQMAs within the proximity of the Proposed Scheme. The nearest AQMA is located 6km to the east, within Peterborough City Council. Further information is detailed in Chapter 5 (Air Quality) (TR010039/APP/6.1).
Areas recognised as sensitive to noise, (eg noise important areas, noise management areas and the ambient noise environment)	Sensitive receptors include dwellings, schools, care homes and churches in addition to other community assets. As detailed in Chapter 11 (Noise and Vibration) (TR010039/APP/6.1) there are 237 noise sensitive receptors within 300m of the construction noise study area and 382 receptors within the operational noise study area. There are two noise important areas (NIA) within the operational study area: IA_ID: 5305, asset owner HE IA_ID: 5303, asset owner HE
Sources and pathways of potential pollution (eg land/ water contamination)	As detailed in Appendix 9.5 (TR010039/APP/6.3) to Chapter 9 (Geology and Soils) (TR010039/APP/6.1), no risks have been identified to Human Health from soils or ground gas on the Proposed Scheme. Geology and soils has therefore been scoped out of further assessment.
Landscape amenity	Chapter 7 (Landscape and visual effects) (TR010039/APP/6.1) describes the baseline topography and visual landscape associated with the Proposed Scheme. There are residential receptors within the southern areas of the study area including the Nene Valley and to the south of the existing A47. These include the villages of Wansford (Prebendal), Stibbington (Stibbington, Folksworth and Washingley) and Sutton (Wittering). The value of views from residential properties associates with people's sense of identity and place. Changes in views are likely to affect the viewers' perception and

Health determinant categories	Health determinants (Glington and Wittering), Elton and Folksworth, and Stilton, Prebendal and Barnack wards)
	experience of the outside world. The susceptibility of such views to change is therefore typically considered to be high but influenced by what is present in the existing view. It therefore follows that the visibility of existing roads or traffic may reduce susceptibility where similar features are proposed. The public right of way (PRoW) network within the study area is extensive and includes named routes including the Nene Way and Hereward Way. Areas where the absence of access is noted include areas on the southern side of the River Nene to the north of Stibbington (there are no footpaths between the river and Stibbington) and areas to the north of the existing A47 east of Sutton Heath Road (there are no footpaths between the existing A47 and the village of Upton).
Safety information associated with the existing affected road network (e.g. numbers killed and seriously injured)	Personal injury collision records for the A1, between grid reference 507354, 300337 and 507521, 299771, and for the A47, between grid reference 507363, 299751 and 510102, 299236, for the five year period between 20th March 2014 and 20th September 2018 have been reviewed to identify any notable trends, or significant road safety issues. A total of 44 collisions were recorded in the study area of which 19 collisions were reported on the A1 and 25 were reported on the A47. On the A1, 16 collisions were classified as being of 'slight' severity and three were classified as 'serious'. No fatalities were recorded during this time period. Additionally, no collisions involving pedestrians, cyclists or horses were recorded during this review period. On the A47, 19 collisions were classified as being of 'slight' severity, five were classified as 'serious' and one recorded as a fatality. There was one collision that involved a pedestrian, which was recorded as 'slight'. No collisions involving cyclists or horses were recorded during this review period. The collision involving a pedestrian occurred in 2015 on the A47, approximately 300m to the west of the A47/ Sutton Heath Road junction and involved a collision between an LGV and a car, where the LGV reversed into a parked car. This resulted in one casualty, a pedestrian, of 'slight' severity. An examination of the location and occurrence of the collisions highlights a number of clusters along the A1 and A47. These clusters are located on the A1 adjacent to the off-slip road in northbound direction, where seven 'slight' collisions and two 'serious' collisions were recorded; at the A47/ Sutton Heath Road junction, where four 'slight' and two 'serious' collisions were recorded.

Non- statutory consultation

12.7.29. Table 12.9 identifies the key feedback received from the public during the 2017 non-statutory and 2018 statutory consultations for the Proposed Scheme. This feedback has been taken into account and incorporated into the assessment where appropriate.

Table 12-9: Information collated from stakeholder consultation

Information collated from non- statutory consultation (2017) and statutory consultation (2018)
Non- statutory consultation (2017)
<u>Land use and accessibility</u> Some respondents expressed concern that congestion during construction could affect businesses and amenities in Peterborough, with a small number of respondents expressing concern that the proposed route would impact heavily on Sacrewell Farm. Several respondents suggested that the bungalow on Sutton Road would have to be demolished for this route to be implemented. A few respondents mentioned that the Proposed Scheme could affect the value of their properties and some others commented that land is being bought unnecessarily from private owners on either side of the route. <u>Human health</u> Some respondents expressed concern that the Proposed Scheme would be located closer to the village of Sutton which could increase noise and air pollution impacting the village. Some respondents expressed concern that landscaping would not be sufficient to mitigate the noise and air pollution impacts which may affect Sutton. Peterborough City Council expressed concern about the potential noise impact on Sacrewell Farm. Some respondents who commented generally on the proposals raised concerns regarding the impact on the environment of the local areas between Wansford and Sutton and along the A1, (for example Sacrewell Farm and properties on Windgate Way and Stibbington), and the noise levels along the A47 and around the surrounding properties potentially increasing significantly with a rise to four lanes of traffic. Some respondents expressed concern that the impact of four lanes of traffic on the visual landscape of the area would be significantly increased. Several respondents suggested methods of mitigating these effects on the local area: to implement screening along the road by planting trees, high banks and installing noise barriers to reduce sound, light and visual pollution for local residents. Others suggest the road should be placed in a cutting in the landscape, lowering the structure for a similar effect.
Statutory consultation (2018)
<u>Land use and accessibility</u> Some respondents expressed concern that the Proposed Scheme will make it more difficult for the local community to enter and leave the villages of Sutton and Wansford, and that the Proposed Scheme takes the new dual-carriageway too close to the River Nene. There was concern that land take resulting Proposed Scheme uses privately owned land of high amenity and environmental value, whereas the 'Northern Route' would use lower-quality land which has already been purchased. There was concern that congestion will increase at the Nene Way Roundabout as a result of the introduction of peak-time traffic signals, and that increases in traffic on the new dual carriageway will make it more difficult to exit Old North Road, potentially a hazard for those living in Wansford. There was suggestion that the existing A47 should be used as a road for local traffic, walkers, cyclists and horse riders with the new dual-carriageway built to the north. <u>Human health</u> There were concerns regarding increases in air quality, noise and impacts to the landscape and visual elements of the area as a result of the Proposed Scheme. Concerns were also raised regarding an adverse effect on wildlife with the proposed route alignment, with suggestion that this could be avoided by using a different option.

Potential impacts

12.8.1. This section identifies potential impacts of the Proposed Scheme on land use and accessibility, which may result in significant effects. Although human health does not report significant effects, the potential impacts section highlights any impacts which would result in positive, negative or neutral health outcomes. These are summarised below.

12.8.

12.8.2. For readability, this section provides an overview of the construction and operational impacts and has been sub-divided into the separate headers under land use and accessibility and human health.

12.8.3. The construction process would be undertaken in phases and predominantly offline, details are provided in Chapter 2 (The Proposed Scheme) (TR010039/APP/6.1).

Construction

Land use and accessibility

12.8.4. Potential temporary construction impacts on land use and accessibility during the construction phase of the Proposed Scheme include the following:

- Temporary land-take from private properties, community land, development land, agricultural land and community assets required to undertake construction activities
- Temporary changes to accessibility to private properties, community land, community assets and businesses during construction of the Proposed Scheme
- Temporary diversions or stopping up of WCH routes
- Increased construction traffic on the existing A47 and local roads leading to a temporary disruption to access private properties, community assets and businesses as a result of road closures and traffic management

12.8.5. Potential permanent construction impacts during the construction phase of the Proposed Scheme include the following:

- Demolition of one private property
- Permanent land-take from private properties, and agricultural land required to undertake construction activities
- Permanent change to access for private properties Abbott's Cottages on the A1 (Great North Road)
- Permanent change to access areas of community land and community assets such as along the existing A47 and Main Road

- Permanent severance of land and buildings which form part of an agricultural holding
- Permanent change to access for private properties
- Permanent change to the access to Sacrewell Farm
- Permanent change to the Wansford Picnic Area access road
- Permanent removal of the existing cycle facilities provided at the A47/A1 roundabouts
- Permanent severance of Sutton Drift and Upton Road onto the A47
- Permanent stopping up of a section of footpath Wansford 4 (ID459) and its replacement with a new section of footpath (PRoW).

Human Health

- 12.8.6. Potential health impacts have been considered in relation to the aspects of the Proposed Scheme's construction, and operation that could give rise to changes to health determinants and hence potentially affect future health outcomes. The consideration of the health outcomes has taken account of the range of potential sensitivities of the communities affected along the Proposed Scheme, including key aspects of their health profiles and with a judgement about the impact likelihood and pathways. Road users have also been briefly considered.
- 12.8.7. Potential impacts to human health which could occur during construction of the Proposed Scheme include:
- Visual effects of new infrastructure on sensitive visual receptors
 - Effects of noise from construction plant and vehicles on communities and residential receptors. Effects of noise on health may include hearing impairment, sleep disturbance, cardiovascular effects, poorer work and school performance⁵
 - Effects of changes in local air quality (including dust dispersal and deposition and odour) from construction vehicles and activities. Effects of air quality on health may include increased risk of cardiovascular and respiratory disease⁶
 - Reduced accessibility to healthcare, community, recreation and educational facilities, and green and open space
 - Stress, anxiety and related wellbeing effects from exposure to (or concern about) sustained construction activity (or construction sites) in proximity to living areas, open spaces, schools, amenities

⁵ Data and statistics regarding noise from the World Health Organisation (WHO) available at:

⁶ Data and statistics regarding air quality from the World Health Organisation (WHO) available at:

- Stress, anxiety and related wellbeing effects from exposure to (or concern about) construction traffic on local roads close to communities, including for users of roads affected by increased levels of traffic for construction

Operation

Land use and accessibility

12.8.8. Potential impacts during operation of the Proposed Scheme on land use and accessibility include the following:

- Permanent changes to severance for private properties, community assets, agricultural land holdings and businesses
- Permanent changes to severance for WCH

Human Health

12.8.9. This section presents the potential impacts of the proposals on health determinants. Their potential to give rise to health effects with a negative, positive or neutral health outcome is assessed in section 12.10, as required in DMRB LA 112 table 3.32. The nature and scale of predicted impacts has been considered in combination with the sensitivity of the baseline to inform consideration of the potential for effects. The judgement on what the health outcomes of changes to health determinants would be has also taken account of there being an identifiable pathway between the predicted impact on health determinant(s) and the health outcomes.

12.8.10. Potential impacts to human health which could occur during the operation of the Proposed Scheme include:

- Effects on changes in traffic noise on communities and residential receptors. Effects of noise on health may include hearing impairment, sleep disturbance, cardiovascular effects, poorer work and school performance⁷
- Effects on changes to air quality on communities and residential receptors. Effects of air quality on health may include increased risk of cardiovascular and respiratory disease⁸
- Changes in access (by foot, cycle or car) to public transport, community assets, green space, parks and countryside
- Changes in community severance
- Perception of the proposed development, including psychosocial effects from concerns about changes in the environment

⁷ Data and statistics regarding noise from the World Health Organisation (WHO) available at:

[REDACTED]

⁸ Data and statistics regarding air quality from the World Health Organisation (WHO) available at:

[REDACTED]

- Stress, anxiety and related wellbeing effects from changes to landscape amenity in proximity to living areas, open spaces, schools, amenities.
- Secondary impacts from consequential developments
- Reduced accident rates and severity of the Proposed Scheme
- Increased accessibility (reduced car journey times using new road) to key employment locations, with potential for improved employment opportunities
- Improved accessibility (reduced walking and cycling journey times between communities using the shared use path)

Design, mitigation and enhancement measures

Construction

Land use and accessibility

- 12.9.1. The Environmental Management Plan (EMP) 1st iteration (**TR010039/APP/7.5**) contains mitigation requirements to be implemented by the Principal Contractor, as detailed in each chapter of the ES. The EMP will be updated as a 2nd iteration, prior to the construction phase, to detail key construction mitigation which would be in place by the Principal Contractor during construction of the Proposed Scheme. Based upon this assessment the following measures are recommended to be included in the EMP:
- 12.9.**
- 12.9.2. Traffic management measures would be put in place as part of the outline Traffic Management Plan (**TR010039/APP/7.6**) to ensure disruption is minimised on those travelling between communities and those travelling to facilities and businesses.
- 12.9.3. Communication with local residents would take place during construction to highlight potential periods of disruption. This would be via newsletters, radio announcements, the Highways England scheme web-page, and an appointed Community Liaison Officer.
- 12.9.4. The Highways England Customer Contact Centre would be available to deal with queries and complaints from the public. An information line would be staffed and a complaint management system in place, used on other major infrastructure projects, to ensure complaints are investigated, action is taken and the complainant receives a response.
- 12.9.5. The Proposed Scheme would be constructed to reduce the need to close and divert footways, PRoW and cycle facilities. Where a closure of a WCH route is required, safe and appropriate alternative routes would be provided to ensure access is maintained during construction. The Principal Contractor would agree all temporary diversion routes with the local authority. Appropriate signage for all

closures or diversions would be used to provide sufficient notice of such closures or diversions.

Human health

- 12.9.6. The Principal Contractor would be required to put in place measures to minimise noise, dust and visual effects. These mitigation measures are set out in the EMP and detailed in the respective chapters in this ES. Further details can be found in the following chapters: Chapter 5 (Air quality), Chapter 7 (Landscape and visual effects) and Chapter 11 (Noise and vibration) (**TR010039/APP/6.1**).

Operation

Land use and accessibility

- 12.9.7. The design, mitigation and enhancement measures that would be provided as part of the Proposed Scheme are described below and shown in Figure 12.2 (**TR010039/APP/6.2**).
- 12.9.8. At the A47/A1 western roundabout, new crossings for cyclists would be provided on the A47 western arm and on the A6118 southern arm to replace the off-road facilities provided at the two existing A47/A1 roundabouts. The new crossings would allow cyclists to connect between the existing A47 to the west of A1 and the proposed on-road route cycle route along Old North Road and Peterborough Road within Wansford which lead to the recently upgraded all-user permissive route (Wansford Nene Way Permissive 1) which passes beneath the A1. The new crossings would also facilitate access to the existing underpass under the A47 where cyclists are required to dismount.
- 12.9.9. New signage would be provided to direct cyclists from the A47/A1 western roundabout via Old North Road and Peterborough Road through Wansford, to the recently upgraded all users permissive route (Wansford Nene Way Permissive 1).
- 12.9.10. A continuation of the recently upgraded all-user route (Wansford Nene Way Permissive 1) would be provided which follows the alignment of the existing access road that would be retained but upgraded, as far as the proposed new access for Sacrewell Farm. Beyond this point, the new east to west route would become a shared footway/cycleway to the point where the upgraded access road would connect with the new A47 alignment. This would replace a section of permissive footpath Wansford Annual Maintenance 113 that passes in front of the Anglian Water pumping station.
- 12.9.11. A new permissive bridleway, albeit substandard in width, would be provided adjacent to the new access road for Sacrewell Farm. The new access would pass under the A47 via a new underbridge so users would no longer be required to cross the A47 at-grade. This new permissive bridleway would replace a

section of permissive footpath Wansford Hereward Way Permissive 3 and permissive footpath Wansford Hereward Way Permissive 2. An appropriate crossing facility would be incorporated on the existing access road to be upgraded to connect between these sections of WCH infrastructure.

- 12.9.12. A combined east to west footway/cycleway would be provided from the petrol filling station, at the point where it links with the new A47 alignment and follows the southern frontage of the new A47 alignment to a point where the route joins the new bridleway on the old alignment of the A47. A new 81m section of footpath (PRoW) would be provided to allow a connection between the new footway/cycleway and footpath Wansford 4. This new section of footpath would replace a 30m section of footpath Wansford 4 which would be lost to the Proposed Scheme. The new footway/cycleway would also connect to the proposed bridleway underpass via the disused railway at Sutton Heath Road.
- 12.9.13. A new all-user route would be provided on the new access road for Sacrewell Farm. The new access would pass under the A47 via a new underbridge so users would no longer be required to cross the A47 at-grade. This new all user route, which would have permissive access rights, would replace a section of permissive footpath Wansford Hereward Way Permissive 3 and permissive footpath Wansford Hereward Way Permissive 2. An appropriate crossing facility would be incorporated on the existing access road to be upgraded to connect between these sections of WCH infrastructure.
- 12.9.14. A new bridleway underpass (Wansford NMU underpass (S02)) suitable for all users would be provided allowing a connection between the proposed footway/cycleway and bridleway on the southern side of the new A47 alignment and the section of Sutton Heath Road which would become a cul-de-sac as a result of the Proposed Scheme. The proposed underpass would utilise the disused railway alignment that is in a cutting at this point. Signage would be provided on Sutton Heath Road to direct pedestrians, cyclists and equestrians to the underpass allowing them to pass beneath the new A47 alignment.
- 12.9.15. A bridleway would be provided on the old alignment of the A47, that would be closed to traffic, to provide a link between the proposed underpass and the point where the new side road linking to Peterborough Road (Ailsworth) is to be provided. The bridleway would then continue on the section of Sutton Drift that would be severed by the Proposed Scheme to a point where Sutton Drift is stopped up. The route from Sutton Drift would then continue as an on-road route to allow cyclists and equestrians to connect with bridleway Sutton 3 to the south-east.
- 12.9.16. A shared footway/cycleway would be provided along the southern side of the proposed new side road alignment that links between the proposed new

roundabout on the A47 and Peterborough Road (at Ailsworth). This new side road utilises the old alignment of the A47. The shared footway cycleway will link to the proposed bridleway at the junction of the old alignment of the A47 and The Drift that is being stopped up by the Scheme. At the Peterborough Road/Nene Way junction, a crossing and transitions would be provided to allow cyclists to return to the carriageway on Peterborough Road to the east into Ailsworth.

Human health

12.9.17. The Principal Contractor would be required to put in place measures to minimise effects to human health as a result of operation of the Proposed Scheme. These mitigation measures are set out in the EMP and detailed in the respective chapters in this ES. Further details can be found in the design, mitigation and enhancement measures section of the following chapters: Chapter 5 (Air quality), Chapter 7 (Landscape and visual effects) and Chapter 11 (Noise and vibration) (**TR010039/APP/6.1**).

Assessment of likely significant effects

12.10.1. The significance of identified effects after mitigation is outlined below. Impacts of moderate significance or above are considered to be a significant effect.

Construction

Land use and accessibility

- ~~12.10.2.~~ During construction, some journeys may be temporarily longer or would experience an increase in congestion due to construction traffic and traffic management measures, especially during peak periods. However, these effects are anticipated to be minimal and only for short time periods. No further mitigation is therefore required.
- 12.10.3. The Traffic Management Plan (**TR010039/APP/7.6**) would define the measures used to reduce the impacts from construction traffic, including measures to reduce worker vehicle movements and to reduce HGV movements, particularly at peak periods with an overall aim to keep traffic moving.
- 12.10.4. Offline working for the construction of the Proposed Scheme would minimise impacts on community access throughout the study area.
- 12.10.5. Sections of the existing A47 would remain open for use, therefore disruptions should be minimised and traffic flows on the existing A47 and other local roads would be maintained, whilst allowing safe working at the interface between the existing road network and the Proposed Scheme.

Private property and housing

- 12.10.6. All changes to journey lengths as a result of the Proposed Scheme in relation to private property and housing, community land and assets and development land and businesses relate to journey length when travelling by vehicle.
- 12.10.7. Old Station House, located on the A47 would be demolished as part of the Proposed Scheme. The magnitude of impact is **major** due to a loss of resource, therefore the effect has been classified as **Moderate adverse**. A moderate significance has been chosen instead of large as the property is currently derelict and not occupied.
- 12.10.8. Access to the properties on Great North Road, to the north of Windgate Way would be altered by the Proposed Scheme due to the permanent severance of access from Windgate Way directly onto the A1. A new access road would be provided from the properties on Windgate Way to the north along the historic route of the A1 connecting at Abbotts Cottage. The access road would improve the safety for users accessing the properties at Windgate Way. The access road would cause a journey length increase of approximately 0.6km for southbound journeys along the A1, and an increase of approximately 0.6km for journeys northbound along the A1 (via the existing Wansford exit). Journeys southbound to the A47 would experience approximately 0.6km journey length increase via the proposed free through link road. The magnitude of impact is **minor** due to the introduction of severance with adequate accessibility provision, therefore the effect has been classified as **Slight adverse**.
- 12.10.9. Access to the properties on Windgate Way would be altered. The proposed new access road from the A1 would be the only access to the A1 for this property and would cause a journey length decrease of 0.03km from the south and 0.34km from the north. The magnitude of impact is **minor** due to a change in access that does not compromise the overall viability of property, therefore the effect has been classified as **Slight beneficial**.
- 12.10.10. Access to the A47 from Heath House would be altered as a result of the Proposed Scheme. Due to the stopping up of Sutton Heath Road onto the A47, the journey length for vehicles accessing the A47 from Heath House would increase by 770m. The magnitude of impact is **minor** due to the introduction of severance with adequate accessibility provision, therefore the effect has been classified as **Slight adverse**.
- 12.10.11. Access to Lower Lodge Farm on Upton Road would be altered by the Proposed Scheme. Due to the severance of Upton Road onto the A47, residents would be required to travel north on Main Road and west on Langley Bush Road, then south on the proposed link road from Sutton Heath Road to access the A47.

This would result in a journey length increase of 2.9km. The magnitude of impact is **moderate** due to the introduction of severance with severe accessibility provision, therefore the effect has been classified as **Moderate adverse**.

- 12.10.12. The community of Upton may experience a degree of severance from Wansford and other communities accessed via the A47 due to the stopping up of Upton Road onto the A47. Access to residential properties on Church Walk in Upton would be altered as a result of the Proposed Scheme. Due to the stopping up of Upton Road onto the A47, those accessing the A47 from these residential properties would be required to travel east onto Langley Bush Road, then south on the proposed link road from Sutton Health Road. There are 12 residential properties located on Church Walk which would experience a journey length increase of between 0.9km (the property located to the west of Church Walk) and 1.1km (the property located to the east of Church Walk). The magnitude of impact is classified as **minor** due to the minor introduction of severance with adequate accessibility provision therefore the effect is **Slight adverse**.
- 12.10.13. The new link road to Sacrewell Farm from the A47 would provide additional access to Mill House on Great North Road, currently only accessible via the A1. When approaching from the A47, journey length would reduce by 0.8m. The magnitude of impact is **minor** due to the removal of severance with adequate accessibility provision, therefore the effect has been classified as **Slight beneficial**.
- 12.10.14. The community of Sutton may experience a degree of severance from Wansford and other communities accessed via the A47 due to the stopping up of Sutton Drift onto the A47. Access onto the A47 for two residential properties located on Sutton Drift, to the south of the A47 in Sutton, would be altered as a result of the Proposed Scheme. For the residential property located 400m south of the A47, the journey length would increase by 530m, and for the property located on the corner of Sutton Drift and Nene Way, there would be a journey length increase of 370m. The magnitude of impact is **moderate** due to the introduction of severance with adequate accessibility provision, therefore the effect has been classified as **Slight adverse**.
- 12.10.15. Residents of Deep Springs have direct access onto the existing A47. Access for residents should not change as a result of the Proposed Scheme.

Table 12-10: Residual effects on private property and housing during construction

Description of impact	Sensitivity	Magnitude of impact	Potential impacts (pre-mitigation)	Residual effect
Demolition of Old Station House	High	Major	Moderate adverse	Moderate adverse
Journey length increase to the A1 for properties on Windgate Way	High	Minor	Slight adverse	Slight adverse
Journey length increase to the A1 for properties on Great North Road	High	Minor	Slight adverse	Slight adverse
Journey length increase for private property Heath House	High	Minor	Slight adverse	Slight adverse
Journey length increase for Lower Lodge Farm in Upton	High	Moderate	Moderate adverse	Moderate adverse
Additional access to Mill House on Great North Road due to link road to Sacrewell Farm	High	Minor	Slight adverse	Slight beneficial
Journey length increase for residential properties located on Sutton Drift in Sutton.	High	Minor	Slight adverse	Slight adverse
Journey length increase for residential properties located on Church Walk in Upton	High	Minor	Slight adverse	Slight adverse

Community land and assets

- 12.10.16. During the construction phase, disruption to access to community facilities will be maintained via the Outline Traffic Management Plan (TR010030/APP/7.6).
- 12.10.17. Access to Sacrewell Farm will be altered as a result of the Proposed Scheme. The proposed Sacrewell link road will provide direct access and improve safety by preventing the requirement to turn onto a dual carriageway. There will be a journey length increase of 0.09km. Therefore, the magnitude is classified as **negligible** and the residual effect as **Slight adverse**.
- 12.10.18. Access to St Michael and all Angels Church would be altered by the Proposed Scheme. Due to the stopping up of Sutton Drift onto the A47, vehicle travellers would be required to access the A47 via Nene Way, resulting in a journey length increase of 0.13km. The magnitude of impact is **minor** due to the introduction of severance with adequate accessibility provision, therefore the effect has been classified as **Slight adverse**.
- 12.10.19. Access to Thornhaugh Parish Church, Church of Saint John the Baptiste, Parish St Mary the Virgin Wansford Church, Wansford Pharmacy, Wansford Surgery

and Wansford Post Office would be unaffected by the Proposed Scheme. The magnitude of impact is classified as **no change** and the effect as **Neutral**.

- 12.10.20. Access to Wansford Pasture and Standen Pasture Nature Reserve would be unaffected by the Proposed Scheme. The magnitude of impact is classified as **no change** and the effect as **Neutral**.

Table 12-11: Residual effects on community land and assets during construction

Description of impact	Sensitivity	Magnitude of impact	Potential impacts (pre-mitigation)	Residual effect
Removal of severance between community and commercial facilities to the north and south of the A47, due to the proposed Sacrewell Link Road	Low	Minor	Slight beneficial	Slight beneficial
Journey length increase to access Sacrewell Farm	High	Negligible	Slight adverse	Slight adverse
Journey length increase to access St Michael & All Angels Church in Upton	High	Minor	Slight adverse	Slight adverse
No change in access to Thornhaugh Parish Church, Church of Saint John the Baptist, Parish St Mary the Virgin Wansford Church, Wansford Pharmacy, Wansford Surgery and Wansford Post Office as a result of the Proposed Scheme	High	No change	No change	Neutral
No change in access to Wansford Pasture and Standen Pasture Nature Reserve	High	No change	No change	Neutral

Development land and business

- 12.10.21. Access to Stamford and Heavenly Chocolates, Origin 8 Deli Cafes and Sacrewell Heritage Museum would be improved by the Proposed Scheme when accessing from the A47 due to the new link road from the A47 to Sacrewell Farm. Those accessing would be able to turn onto the link road from the A47 instead of travelling toward the A1/ A47 roundabouts, north on the A1 and east on Windgate Way. Journey lengths would decrease by 1.34km for Stamford Heavenly Chocolates, 1.26km for Origin 8 Deli Cafes and 1.75km for Sacrewell Heritage Museum. The magnitude of impact is classified as **minor** due to the minor reduction of severance and the effect as **Slight beneficial**.
- 12.10.22. Access to the petrol filling station would be altered by the Proposed Scheme; however access would still be possible directly from the A47 via a slip road. Therefore the magnitude of impact is classified as **no change** and the effect is classified as **no change**. To re-join the A47, there would be a journey length increase of 0.75km as users would be required to exit the petrol filling station to the west and re-join at the east A1/ A47 roundabout. However, this change

would improve safety, preventing the requirement to turn onto a dual carriageway. The magnitude of impact is classified as **minor** due to the minor introduction of severance due to a journey length increase and the effect as **Slight adverse**.

- 12.10.23. Access to Processors and Growers on Great North Road would not be affected by the Proposed Scheme. The magnitude of impact is classified as **no change** and the effect as **no change**.
- 12.10.24. Access to Glyn's Driving Tuition and James Driver Training is unlikely to change as a result of the Proposed Scheme. The magnitude of impact is classified as **no change** and the effect as **no change**.
- 12.10.25. Access to The Chimes hotel and The Old Rectory is unlikely to change as a result of the Proposed Scheme. The magnitude of impact is classified as **no change** and the effect as **no change**.
- 12.10.26. Access to Wansford Airport Taxi Service, Cross Keys Hotel and In Step Foot Clinic is unlikely to change as a result of the Proposed Scheme. The magnitude of impact is classified as **no change** and the effect as **no change**.
- 12.10.27. Access to Longfoot M F & Son would be altered as a result of the Proposed Scheme. Due to the stopping up of Upton Road onto the A47, those accessing the A47 from Longfoot M F & Son would be required to travel east onto Langley Bush Road, then south on the proposed link road from Sutton Health Road, resulting in a journey length increase of 0.8km. The magnitude of impact is classified as **minor** due to the minor introduction of severance with adequate accessibility provision therefore the effect is **Slight adverse**.

Table 12-12: Residual effects on development land and businesses during construction

Description of impact	Sensitivity	Magnitude of impact	Potential impacts (pre-mitigation)	Residual effect
Journey length decrease to Stamford Heavenly Chocolates, Origin 8 Deli Cafes and Sacrewell Heritage Museum due to the new link road	Medium	Minor	Slight beneficial	Slight beneficial
No change in access to Processors and Growers, Glyn's Driving Tuition, James Driver Training, Wansford Airport Taxi Service, Cross Keys Hotel and In Step Foot Clinic	Medium	No change	No change	No change
Journey length increase to the A47 from the petrol filling station	Medium	Minor	Slight adverse	Slight adverse
No change in journey length to access the petrol filling station	Medium	No change	No change	No change

Description of impact	Sensitivity	Magnitude of impact	Potential impacts (pre-mitigation)	Residual effect
Journey length increase to Longfoot M F & Son	Medium	Minor	Slight adverse	Slight adverse

Agricultural land holdings

- 12.10.28. Potential effects on individual land holdings during the construction of the Proposed Scheme are outlined below and summarised in Table 12.13. The area of agricultural land which could be returned to the holding following construction is also presented.
- 12.10.29. Currently holding 1 can be accessed from the existing A47 and via the A1. Both of these access points would be redesigned as part of the Proposed Scheme. Approximately 200 ha owned by the holding is let on a long-term Farm Business Tenancy. The landowner partially completed a questionnaire to support the assessment; however, no details were received from the tenant. A high-level review indicates that a range of fruit, vegetable and cereal crops are grown on-site. The main farm hosts an approximate 22 ha visitor attraction, with a range of rare breed, grazing and non-grazing livestock. These require daily care. There are also several non-agricultural businesses located on the holding with commercial offices on-site. The existing A47 would remain operational for the duration of the construction works; however, provisional traffic management measures are likely to have a temporary adverse effect on agricultural operations. As holding 1 has been identified as having a very high sensitivity, with a minor magnitude of temporary impact, the residual effect is considered to be **Moderate adverse**.
- 12.10.30. A returned questionnaire was not received from holding 2, on the basis that the land potentially impacted by the Proposed Scheme was outlying from the main unit, as confirmed by the landowner. The land is currently tenanted and is covered by a Countryside Stewardship Mid-Tier agreement⁹. From a high level review the land appears to be low input, unproductive grass or scrubland. It has been assumed that the land would need to be intermittently grazed to comply with this agreement and so would require daily access for stock checks. The main impact on farm income would come from the loss of the Mid-Tier agreement payment from the area impacted by the Proposed Scheme but this is likely to be small and is highly unlikely to impact on the ongoing viability of the business. Access would be unaffected though temporary road traffic measures may cause a delay. As holding 2 has been identified as having a very high

⁹ Farmers are paid to carry out certain environmental actions on their farmland through the Proposed Scheme and failure to meet the obligations of the agreement may result in a reduction in the annual payment.

sensitivity, with a negligible magnitude of temporary impact, the residual effect is considered to be **slight adverse**.

- 12.10.31. A partially completed questionnaire was received from holding 3. Approximately 5 ha of land would be removed by the Proposed Scheme to construct a new link between the A47 and the south bound carriageway of the A1. The land is tenanted and is outlying from the main unit, which is located near Upton. The construction effect on this land would have a minor impact on the turnover and profitability of the wider holding. However, there is also potential for an indirect effect on the profitability of the holding from the closure of Upton Road. The main access and egress to the A47 for residents of Upton and for large farm equipment and lorries to farm infrastructure would be a narrow, single track lane between Upton and Langley Bush Road. New passing places are proposed along this lane. As holding 3 has been identified as having a high sensitivity, with a moderate magnitude of temporary impact, the residual effect is considered to be **moderate adverse**.
- 12.10.32. Holding 4 represents owner occupied land used for arable production on a standard 5-6 year rotation. Approximately 3.5 ha would be required during construction. Access to the land is via Sutton Drift and would not be directly affected. In addition to land taken, mature hedgerows would be removed as result of the Proposed Scheme. As holding 5 has been identified as having a high sensitivity, with a negligible magnitude of temporary impact, the residual effect is considered to be **slight adverse**.
- 12.10.33. Holding 5 is an owner occupied, grassland farm, predominantly used for hay production. Some non-agricultural livestock, which requires daily access, are also kept. Approximately 2.1 ha would be required from the 15 ha holding during construction. This equates to 14% of the total area. This is likely to have an adverse impact upon the turnover and profitability of the farming enterprise. Access to the land and farm infrastructure would be unaffected by the Proposed Scheme. As holding 5 has been identified as having a very high sensitivity, with a minor magnitude of temporary impact, the residual effect is considered to be **moderate adverse**.
- 12.10.34. Currently the land tenanted by holding 6 is accessed from the main unit from the Sutton roundabout via Upton Road. While the access would not be impacted directly, Upton Road would be closed resulting in a longer journey via a narrow, single track lane (Upton Drift). The Proposed Scheme would also reduce the size of the remaining field area with approximately 19 ha required during construction. Although this is only 3% of the wider holding, the remaining small field sizes would make the land less economical to farm. These factors are likely to have an adverse impact upon the turnover and profitability of the farming enterprise. As holding 6 has been identified as having a high sensitivity, with a

negligible magnitude of temporary impact, the residual effect is considered to be **slight adverse**.

- 12.10.35. As noted above, a questionnaire was not received from Holding 7. Tenant details were available for most of the land but not all. Where tenant information was available, these have been consulted. The land under holding 7 relates to the land where no tenant details were available. The land area covered by holding 7 relates to small areas of arable land required for temporary works. There would also be some long-term impacts resulting from the removal of mature hedgerow. As holding 7 has been identified as having a high sensitivity, with a negligible magnitude of temporary impact, the residual effect is considered to be **slight adverse**.

Table 12-13: Assessment of temporary construction impacts on agricultural holdings

Holding name	Sensitivity to change	Total area required during construction (ha)	Construction severance	Magnitude of Impact	Residual effects	Area to be restored to agriculture (ha)
1	Very High	18.70	Moderate	Minor	Moderate adverse	8.91
2	Very High	0.72	Minor	Negligible	Slight adverse	0.45
3	High	5.58	Moderate	Moderate	Moderate adverse	0.53
4	High	2.85	Minor	Negligible	Slight adverse	1.15
5	Very High	2.41	Minor	Minor	Moderate adverse	0.27
6	High	18.95	Minor	Negligible	Slight adverse	8.19
7	High	0.3	Minor	Negligible	Slight adverse	0.29

- 12.10.36. The permanent effects from the construction of the Proposed Scheme on individual land holdings is outlined below and summarised in Table 12.14. The scale of effect is based on the proportion of land required from the individual holdings.
- 12.10.37. Holding 1 would potentially have land impacted to the north and south sides of the Proposed Scheme with a permanent land-take of approximately 8 ha. This equates to 4% of the wider holding. The Proposed Scheme is unlikely to impact on the long-term viability of the holding with new access routes to be created from the A47 and the A1. As holding 1 is identified as being of very high sensitivity, with a negligible magnitude of permanent impact, the residual effect is considered to be **slight adverse**.

- 12.10.38. Less than 1 ha of unproductive grassland and incomplete mature hedgerow would be removed from holding 2. This equates to less than 1% of the size of an average farm in the area. The Proposed Scheme is highly unlikely to impact on the long-term viability of the wider holding. As holding 2 is identified as being of very high sensitivity, with a negligible magnitude of permanent impact, the residual effect is considered to be **slight adverse**.
- 12.10.39. An entire arable field totalling 5 ha, currently tenanted by holding 3, would be permanently taken to facilitate the Proposed Scheme. This equates to 1% of the wider holding. There is a potential permanent impact to the agricultural holding due to the closure of Upton road and increased travel time and fuel costs. As holding 3 is identified as being of high sensitivity, with a minor magnitude of permanent impact, the residual effect is considered to be **slight adverse**.
- 12.10.40. Approximately 1.7 ha of productive arable land and mature hedgerow would be permanently taken by the Proposed Scheme. This equates to less than 1% of the wider holding. The Proposed Scheme is highly unlikely to impact on the long-term viability of the wider holding. As holding 4 is identified as being of high sensitivity, with a negligible magnitude of permanent impact, the residual effect is considered to be **slight adverse**.
- 12.10.41. The 2.1 ha required during construction would not be returned to holding 5. This equates to 14% of the total holding area. While the Proposed Scheme is unlikely to impact on the long-term viability of the wider holding, the permanent removal of this land would adversely impact on its turnover and profitability. As holding 5 is identified as being of very high sensitivity, with a minor magnitude of permanent impact, the residual effect is considered to be **moderate adverse**.
- 12.10.42. Approximately 10.76 ha of productive arable land and mature hedgerow would be permanently taken by the Proposed Scheme. This equates to 3% of the wider holding. The Proposed Scheme is unlikely to impact on the long-term viability of the wider holding. As holding 6 is identified as being of high sensitivity, with a negligible magnitude of permanent impact, the residual effect is considered to be **slight adverse**.
- 12.10.43. Less than 1 ha of productive arable land and mature hedgerow would be permanently taken from holding 7 by the Proposed Scheme. This equates to less than 1% of the wider holding. The Proposed Scheme is highly unlikely to impact on the long-term viability of the wider holding. As holding 7 is identified as being of high sensitivity, with a negligible magnitude of permanent impact, the residual effect is considered to be **slight adverse**.

Table 12-14: Assessment of permanent construction impacts on agricultural holdings

Holding Name	Sensitivity to Change	Land removed from holding (ha) (and % of total size)	Permanent Severance	Magnitude of Impact	Residual Effect
1	Very High	9.79 (3)	Negligible	Negligible	Slight adverse
2	Very High	0.27 (<1)	Negligible	Negligible	Slight adverse
3	High	5.04 (1)	Minor	Minor	Slight adverse
4	High	1.70 (<1)	Negligible	Negligible	Slight adverse
5	Very High	2.14 (14)	Negligible	Minor	Moderate adverse
6	High	10.76 (3)	Negligible	Negligible	Slight adverse
7	High	0.06 (<1)	Negligible	Negligible	Slight adverse

Walkers, cyclists and horse-riders

- 12.10.44. The Proposed Scheme would likely result in the diversion or temporary closure of some routes during construction, which would become permanent diversions and closures during operation of the Proposed Scheme.
- 12.10.45. Construction of the Proposed Scheme would permanently remove the cycle facilities at the A47/A1 roundabouts. The sensitivity of these cycle facilities is classified as medium. Whilst these offline facilities offer cyclists a direct route when travelling east to west, they are discontinuous and require cyclists to re-join the A47 carriageway between the two roundabouts when passing over the A1 overbridge. The existing facilities are also not well used. The Proposed Scheme would have a major impact on users as the proposed new route for cyclists would be approximately 600m longer than the existing route along the A47. However, when considering mitigation, the replacement facilities would allow cyclists to safely cross the A47 and Old North Road at the A47 western roundabout and follow a newly signed route through Wansford on Old North Road and Peterborough Road to connect to the all user route which passes beneath the A1 and then connects to a shared footway/cycleway that is proposed to run adjacent to the new A47 alignment. Taking account of the amenity and potential road safety benefits associated with directing cyclists through Wansford instead of along the A47 and applying professional judgement, the magnitude of the impact has been reduced to **moderate**. Effects are therefore assessed as permanent **Moderate adverse**.
- 12.10.46. Construction of the Proposed Scheme would result in the permanent realignment of the access road serving Sacrewell Farm. This would require the permanent diversion of the permissive route Wansford Hereward Way Permissive 3 that runs along the access road and the permanent diversion of the permissive route Wansford Hereward Way Permissive 2 which links to it. The

sensitivities of these routes are classified as high since they provide users with a connection between the leisure routes on either side of the A47. For users approaching from the direction of Wansford, the Proposed Scheme would have a **negligible beneficial** impact since the journey length would reduce by less than 50m. When considering mitigation, the provision of the permissive bridleway and the underbridge would facilitate access to Sacrewell Farm without the need for users to interact with the A47. Taking account of the amenity and potential road safety benefits associated with providing the underbridge and applying professional judgement, the magnitude of the impact has been increased to **minor beneficial**. Effects are therefore assessed as permanent **Moderate beneficial** for users approaching from Wansford.

- 12.10.47. For users approaching from the permissive routes to the east, the Proposed Scheme would have a **minor adverse** impact since the journey length would increase by 120m. Again, when taking account of the amenity and potential road safety benefits associated with the proposed mitigation and applying professional judgement, the magnitude of the impact has been reduced to **negligible adverse**. Effects are therefore assessed as permanent **Slight adverse** for users approaching from the east.
- 12.10.48. The Proposed Scheme provides a new link road from the A47/A1 eastern roundabout which facilitates access to Sacrewell Farm. This new link road incorporates the Wansford picnic area access road, which would be upgraded as far as the petrol filling station. The provision of this new link road would have an impact on the permissive routes Wansford Nene Way Permissive 1 and Wansford Annual Maintenance 113 that run parallel to the existing access road. The sensitivities of these permissive routes are classified **high** as they provide a link between Wansford and the routes along the River Nene and the permissive route to Sacrewell Farm. The Proposed Scheme would not result in any changes to journey length for either of these permissive routes so the magnitude of the impact is **no change**. When considering mitigation, the permissive route between the Wansford picnic area and the new access for Sacrewell Farm would be improved such that it is suitable for use by all WCH and would be segregated from the carriageway. Beyond the Sacrewell Farm access, the permissive route would be upgraded to a shared footway/cycleway as far as the petrol filling station. Taking account of the amenity and potential road safety benefits associated with the proposed upgrades and applying professional judgement, the magnitude of the impact is increased to **negligible beneficial**. Effects are therefore assessed as **Slight beneficial**.
- 12.10.49. The Proposed Scheme would remove the existing A47/Upton Road/Peterborough Road roundabout severing the north to south route for general traffic at this point. Upton Road and Peterborough Road are advisory cycle routes. However, the north to south route for general traffic would be

replaced further to the west with a new roundabout and new link roads to Sutton Heath Road to the north and Peterborough Road to the south (using a section of the existing A47 alignment). Cyclists would be discouraged from using the new roundabout and would be directed to a proposed new bridleway underpass at the disused railway line via the section of Sutton Heath Road that would be severed.

- 12.10.50. On the southern side of the new A47 alignment, cyclists, pedestrians and equestrians would be able to use a new bridleway running along the existing alignment of the A47 that would be closed to traffic and a shared footway/cycleway facility would also be provided adjacent to the section of the existing A47 alignment that would provide a link to Peterborough Road to the east. The sensitivity of the advisory cycle route is classified as **high** as it is used frequently by cyclists to cross the A47. Depending upon the approach direction of cyclists, the Proposed Scheme would have either an adverse or beneficial impact. For cyclists travelling between Ailsworth and Upton (and vice versa), the journey length would increase by more than 500m resulting in a **major adverse impact**. When considering mitigation, the proposed route for cyclists (and pedestrians) would be improved with the shared facilities being segregated from traffic and safe, north to south movements across the new A47 alignment being catered for by the provision of the new underpass. Taking account of the amenity and road safety benefits associated with the proposed upgrades and applying professional judgement, the magnitude of the impact is reduced to **moderate adverse**. Effects are therefore assessed as permanent **Moderate adverse** for cyclists travelling between Ailsworth and Upton.
- 12.10.51. The proposed underpass, shared footway/cycleways and bridleway would offer an alternative route for cyclists travelling between Southorpe and Ailsworth (and vice versa) avoiding the need for users to pass through Upton. The alternative route would decrease the journey length by more than 500m resulting in a **major beneficial impact**. Taking into account the amenity and road safety benefits associated with the proposed upgrades and applying professional judgement, the magnitude of the impact remains as **major beneficial**. Effects are therefore assessed as permanent **Large beneficial** for cyclists travelling between Southorpe and Ailsworth.
- 12.10.52. The Proposed Scheme would result in the permanent removal of the small layby on the existing A47 alignment and the permanent stopping up of a 30m section of footpath Wansford 4 which connects to the layby. The section of footpath lost would be replaced by a new 81m section of footpath (PRoW) which would provide a connection between the proposed new shared footway/cycleway, running parallel to and to the south of the new A47 alignment, and the remaining section of footpath Wansford 4. The sensitivity of footpath Wansford 4 is classified as medium since it a link between the layby and routes along the north

side of the River Nene for recreational trips. The Proposed Scheme would not result in any changes to journey length for users so the magnitude of the impact is no change. When considering mitigation, users of footpath Wansford 4 would be provided with a direct connection to the new shared footway/cycleway which provides an alternative route for east to west (and vice versa) trips. Taking account of the amenity and potential road safety benefits associated with the proposed upgrades and applying professional judgement, the magnitude of the impact is increased to negligible beneficial. Effects are therefore assessed as **Slight beneficial**.

12.10.53. The Proposed Scheme would have **no change** on the other WCH facilities identified in Table 12.15. Effects are therefore assessed as **Neutral**.

Table 12-15: Residual effects on WCH during construction

Description of impact	Sensitivity	Magnitude of impact (pre-mitigation)	Magnitude of impact (post-mitigation)	Residual effect
Permanent removal of the cycle facilities at A47/A1 roundabouts	Medium	Major adverse	Moderate adverse	Moderate adverse
Diversion of Wansford Hereward Way Permissive 3 and Wansford Hereward Way Permissive 2 along the new access road for Sacrewell Farm (for users approaching from Wansford)	High	Negligible beneficial	Minor beneficial	Moderate beneficial
Diversion of Wansford Hereward Way Permissive 3 and Wansford Hereward Way Permissive 2 along the new access road for Sacrewell Farm (for users approaching from the east)	High	Minor adverse	Negligible adverse	Slight adverse
New link between A47/A1 eastern roundabout and petrol filling station	High	No change	Negligible beneficial	Slight beneficial
Removal of A47/Upton Road / Peterborough Road roundabout (cycle movements between Ailsworth and Upton)	High	Major adverse	Moderate adverse	Moderate adverse
Removal of A47/Upton Road / Peterborough Road roundabout (cycle movements between Southorpe and Ailsworth via Upton)	High	Major beneficial	Major beneficial	Large beneficial

Description of impact	Sensitivity	Magnitude of impact (pre-mitigation)	Magnitude of impact (post-mitigation)	Residual effect
Permanent stopping up of Wansford 4 and replacement with new section of footpath	Medium,	No change	Negligible beneficial	Slight beneficial

Human health

12.10.54. Effects of construction on human health determinants are described in Table 12.16.

12.10.55. References to significant effects are detailed in the corresponding ES chapter, where table 12.16 assesses the change to health determinants and resulting health outcome which may occur due to the identification of potential significant effects.

Table 12-16: Residual construction effects on human health

Health Determinant	Predicted impacts on determinants	Residual effect of health outcome
Access to healthcare facilities	During the construction of the Proposed Scheme, traffic management and the increase in construction traffic to the area would temporarily restrict traffic movements. Wansford Surgery, located to the south west of the Proposed Scheme can be accessed via Peterborough Road off the A1 or via the A1/ A47 roundabouts. During construction, diversions would be provided as part of the mitigation for the Proposed Scheme, therefore access to healthcare facilities would be retained. Due to the alternative access routes, the reduction in access is not considered to have a detrimental effect to the human health of the communities and therefore the health outcome is assessed as neutral.	Neutral
Access to community, recreation and education facilities	Several WCH routes would be affected as part of the Proposed Scheme, including the replacement of cycling facilities at the A47/ A1 roundabout and the diversion of footpaths Wansford Hereward Way Permissive 3 and Wansford Hereward Way Permissive 2, as detailed in section 12.10 construction impacts. Physical inactivity is a primary contributor to a wide range of chronic diseases including, but not limited, to coronary heart disease, stroke and diabetes. Physical activity is important for the mental health of the population and helps to prevent obesity, therefore any temporary stopping up of paths during construction would potentially have negative impacts to human health. There are no educational facilities within the study area that are anticipated to be affected by the Proposed Scheme during construction. Mitigation measures have been proposed to ensure paths are maintained throughout the construction period, by using diversion routes. This would be agreed with the local authority and would reduce any adverse effects. It is not predicted that any temporary works would have an effect on	Neutral

Health Determinant	Predicted impacts on determinants	Residual effect of health outcome
	health determinants as a result of changes to access and local networks, therefore the health outcome is assessed as neutral	
Access to green and open space	During construction, access to green and open space would be maintained by the existing A47 and local roads. Mitigation would be in place to reduce impacts from construction traffic through the outline Traffic Management Plan (TMP) (TR010039/APP/7.6). PRoW access would be maintained or where this is not possible, diversions would be put in place to ensure access to green and open space (Wansford Pasture and Standen's Pasture nature reserves, and Wansford picnic area) is maintained. As access to green and open space would be maintained, the health outcome of construction of the Proposed Scheme on access to green and open space is assessed to be neutral.	Neutral
Existing and predicted levels of air and noise pollution	Mitigation measures for the construction of the Proposed Scheme are provided in Chapter 5 (Air Quality) (TR010039/APP/6.1) and in the EMP. When mitigation measures are implemented during the construction phase of the Proposed Scheme, fugitive emissions of dust from the construction site would be monitored and managed appropriately and as such should not cause significant nuisance at nearby receptors. The conditions would be monitored by checking the weather conditions and identifying those activities where fugitive dust emissions could be generated. Measures to minimise the impacts would be implemented and actioned as appropriate and regularly reviewed. With mitigation measures in place, no receptors have been identified as significantly affected by the Proposed Scheme. The change in HGV traffic would not remain constant for the period of construction and is predicted to vary depending on the construction programme. All traffic associated with construction would be managed via a Traffic Management Plan which would aim to route traffic away from sensitive receptors (where possible) and schedule deliveries outside of peak times if possible. There is the potential for residents and members of the communities to be temporarily affected by increases of noise or dust disturbance during the construction period. The noise generating activities associated with construction include vehicle movements such as HGVs and heavy machinery, all of which could increase noise and vibration impacts for residents or members of the community. Temporary noise barriers would help to reduce these impacts, however negative health effects may be experienced by some communities due to the noise created by construction activities. Subject to the use of temporary and permanent noise barriers, construction noise monitoring and mitigation measures, no receptors have been identified to be significantly affected by noise from construction and construction traffic. Therefore, the health outcome of changes to air quality and noise disturbance during construction of the Proposed Scheme is assessed to be neutral.	Neutral

Health Determinant	Predicted impacts on determinants	Residual effect of health outcome
Landscape amenity	During construction of the Proposed Scheme, there is potential for visual receptors to experience significant effects as described in Chapter 7 (Landscape and visual effects) (TR010039/APP/6.1), therefore potentially resulting in changes to health determinants and health outcomes. Receptors include residents, those using PRoW, those using areas of community land and the views from the road. Chapter 7 (Landscape and visual effects) assessment (TR010039/APP/6.1) concludes that during construction, seven residential properties would experience significant visual effects. Sutton Lodge would experience a Large adverse effect. The following would experience a Moderate adverse effect: • Windgate Way (property with same name as route) • Heath House, Sutton Heath Road • Lower Lodge Farm, Upton Road • Willowhayne House, Sutton Drift, Sutton • Properties on north-eastern fringe of Sutton village (including Manor Farm) • Stibbington (properties at Old Great North Road with rear views across valley) Five PRoW would experience significant effects during construction. The following would experience Large adverse effects: • The Nene Way riverside footpath (including sections of PRoW and permissive paths) • The footpath network north of Sacrewell Farm Visitor Centre including sections of Hereward Way and Windgate Way around Sacrewell Lodge with views principally to the south-west • The footpath through the Sacrewell Farm Visitor Centre (a section of Hereward Way) with views principally to the south-east The following would experience Moderate adverse effects: • The east to west footpath between Sacrewell Farm and Sutton Heath Road • The east to west footpath west of Stibbington Significant adverse visual affects during construction as described in Chapter 7 (Landscape and visual effects) (TR010039/APP/6.1) would be temporary. Therefore, the health outcome of construction of the Proposed Scheme on landscape amenity as a determinant of human health is assessed to be neutral.	Neutral
Stress and anxiety	During construction of the Proposed Scheme, there is potential for increased stress and anxiety due to journey length delays as a result of construction traffic. Mitigation would be in place to reduce impacts from construction traffic through the outline Traffic Management Plan (TMP) (TR010039/APP/7.6). Highways England Customer Contact Centre would also be available to deal with queries and complaints from the public. An information line would be staffed and a complaint management system in place, used	Neutral

Health Determinant	Predicted impacts on determinants	Residual effect of health outcome
	on other major infrastructure projects, to ensure complaints are investigated, action is taken and the complainant receives a response.	
Safety	The construction of the Proposed Scheme is not considered to have any impact to the safety of communities or individual residents.	Neutral

Operation

Land use and accessibility

Private property and housing

- 12.10.56. One private property, Old Station House, is being demolished as a result of the Proposed Scheme. There are no additional permanent property demolitions or loss of curtilage of properties as a result of the Proposed Scheme. All private properties would have an access maintained, however there might be a change in journey length for some properties as a result of the Proposed Scheme. The Proposed Scheme would include altered and newly formed accesses to private properties where required. Where the access is altered as a part of the construction, this has been assessed as part of the construction assessment.
- 12.10.57. Permanent impacts on private property and housing resulting from land-take or a change in access are reported under construction. No further impacts on private property and housing are anticipated during operation of the Proposed Scheme.
- 12.10.58. Impacts on receptors during operation of the Proposed Scheme are reported in the 5.8 Potential Impacts of ES Chapter 5 (Air Quality) (TR010039/APP/6.1), and in the 7.8 Potential Impacts section of Chapter 7 (Landscape and visual effects) and Chapter 11 (Noise and vibration) (TR010039/APP/6.1).

Community land and assets

- 12.10.59. Permanent impacts on community land and assets resulting from land-take or a change in access are reported under construction. No further impacts on community land and assets are anticipated during operation of the Proposed Scheme.

Development land and business

- 12.10.60. Permanent impacts development land and business resulting from land-take or a change in access are reported under construction. No further impacts on community land and assets are anticipated during operation of the Proposed Scheme.

Agricultural land holdings

- 12.10.61. Permanent effects on agricultural land holdings resulting from land-take or a change in access are reported under construction. No further impacts on agricultural land holdings are anticipated during operation of the Proposed Scheme.

Walkers, cyclists and horse-riders

- 12.10.62. Some sections of the existing A47 carriageway would be realigned and upgraded to include a shared footway/cycleway and bridleway albeit with the new facilities segregated from the carriageways. The section of the existing A47 that would be closed to general traffic would be converted to a bridleway and those sections to be de-trunked would be narrowed (to reflect the lower levels of traffic that they would carry in the future) and improved to include shared footway/cycleway facilities. A new underbridge at the Sacrewell Farm access and the proposed bridleway underpass at the disused railway line would facilitate safe north to south movements across the new A47 alignment for all users.
- 12.10.63. The provision of the various sections of new combined footway/cycleway and bridleway would provide safer and more pleasant journeys for cyclists and pedestrians undertaking east to west trips between Wansford and Ailsworth and for equestrians crossing the A47 north to south. Residual effects are described in Table 12.17.

Table 12-17: Residual operation effects on WCH

Description of impact	Sensitivity	Magnitude of impact	Residual effects
New combined footway/cycleway along the realigned and improved section of the A47 between petrol filling station and the proposed underpass at the disused railway line.	n/a	n/a	Slight beneficial
New bridleway along the section of the A47 to be closed to traffic between the underpass at the disused railway line and the new link road to Peterborough Road.	n/a	n/a	Slight beneficial
New combined footway/cycleway on the new link road from the proposed A47 roundabout to Peterborough Road	n/a	n/a	Slight beneficial
New bridleway underpass at the disused railway line that is suitable for pedestrians, cyclists and equestrians.	n/a	n/a	Slight beneficial

Human health

12.10.64. Residual effects of operation on human health are provided in Table 12.18.

Table 12-18: Residual operation effects on human health

Health Determinant	Predicted impacts on determinants	Residual effect of health outcome
Access to healthcare facilities	Healthcare facilities, community, recreation and education facilities are located primarily in Wansford. When accessing from the south, drivers would access via Peterborough Road off the A1, which would be stopped up as part of the Proposed Scheme. However, adequate accessibility provision exists via an earlier turning or using the A47/ A1 roundabout. New WCH provision would be provided to enable active travel to community assets in Wansford and a new cycling route would be provided connecting the east and west sides of the A1. The new WCH routes are predicted to result in a positive impact on population and human health and enable additional provision for active travel. The footway and cycleway would also provide access to areas of open space and community assets, and are likely to encourage more people to access the area on foot or by bicycle, which has the potential to result in increased physical activity of the local population, and other users from other communities. The improved A47 and provision of a WCH route would help to reduce transport barriers to health (such as accessing appointments) by enabling more options for travel. Therefore, the health outcome of construction of the Proposed Scheme on access to healthcare, community, recreation and educational facilities as a determinant of human health is assessed to be positive.	Positive
Access to community, recreation and education facilities		Positive
Access to green and open space	Due to the proposed Sacrewell Link Road, there would be increased connectivity between the north and south of the existing A47 with the Wansford Picnic area. Therefore the Proposed Scheme would result in improved access and therefore a positive health outcome for access to green/open space for local residents.	Positive
Existing and predicted levels of air and noise pollution	Twenty-two human receptors were identified and included within the air quality assessment, in ES Chapter 5 (Air quality) (TR010039/APP/6.1). Thirteen of the 22 receptors are expected to show a deterioration in air quality, 6 showing an improvement in air quality and 3 showing no change. However, the annual air quality objectives (AQO) are not expected to be exceeded at any receptors during operation. The ES Chapter 5 (Air quality) (TR010039/APP/6.1) concludes that there are no predicted exceedances of PM₁₀ or PM_{2.5}. The operational effect of the Proposed Scheme on air quality is therefore not anticipated to result in negative health effects on any receptors. The use of the proposed WCH route would help to encourage people to walk and cycle more often. The Transport and Health Joint Strategic Needs Assessment (JNSA) for Cambridgeshire County Council outlines that the	Air quality: Neutral Noise: Neutral

Health Determinant	Predicted impacts on determinants	Residual effect of health outcome
	use of WCH routes aim to support the JNSA by reducing air pollution through modal shift. Adverse noise effects off-line may occur due to increases in traffic flows and speeds on other parts of the local road network. Of residential, community facilities and PRow receptors, initial significant adverse noise effects are predicted at the following, due to a change in road traffic noise: • PRow: Footpath 4: Wansford, Peterborough (road entrance to Sacrewell) (significant during daytime) • PRow: Hereward Way (road entrance to Sacrewell) (significant during daytime) No further significant effects on receptors have been identified within the ES Chapter 11 (Noise and vibration) (TR0010039/APP/6.1). After the implementation of mitigation outlined within the chapter (low-noise road surfacing to be used, hot rolled asphalt) the final operational significance is determined to be not significant. The operational effect of the Proposed Scheme on noise and vibration as a determinant of human health is therefore assessed to be neutral.	
Landscape amenity	During operation of the Proposed Scheme, there is potential for visual receptors to experience significant effects as described in ES Chapter 7 (Landscape and visual effects) (TR010039/APP/6.1), therefore potentially resulting in changes to health determinants and health outcomes. Receptors include residents, those using PRow and the views from the road. ES Chapter 7 (Landscape and visual effects) (TR010039/APP/6.1) assessment concludes that after mitigation during year 1 of operation, three PRow are anticipated to experience Moderate adverse effects and residential receptors in Stibbington (properties at Old Great North Road with rear views across the valley) are anticipated to experience Moderate adverse effects. During year 15 of operation there are anticipated to be no significant effects on PRow and no significant effects expected at residential receptors.	Neutral

Monitoring

- 12.11.1. Once built and operational the significant effects reported in Section 12.10 would be permanent and unchanging, therefore no monitoring would be required.
- 12.11.2. Monitoring would take place for receptors in which significant effects have been identified due to changes in noise and vibration, during construction and operation of the Proposed Scheme. For further detail please Chapter 11 (Noise and vibration) (TR010039/APP/6.1).
- 12.11.**

- 12.11.3. Monitoring requirements for landscape visual effects would be determined as an outcome of the DCO process. The maintenance of mitigation such as planting and seeding would continue for a period of five years before being handed over to the future maintaining authority for on-going highway maintenance.

Summary

- 12.12.1. Overall, impacts on population and human health are predominantly non-significant once the Proposed Scheme is operational, however the derelict property 'Old Station Road' would experience a permanent **Moderate adverse** residual effect due to its demolition. Lower Lodge Farm on Upton Road would also experience a Moderate adverse residual effect due to an increase in journey length as a result of the Proposed Scheme.
- 12.12.** 12.12.2. For those travelling by vehicle to access properties, businesses and community assets using the Proposed Scheme by vehicle, benefits would be experienced in terms of safety for road users. There would be a journey length decrease when accessing Mill House on Great North Road due to the proposed link road to Sacrewell Farm. Access would be improved for some community assets such as the petrol filling station.
- 12.12.3. **Moderate adverse** temporary effects during construction are expected at agricultural holding 1, holding 3 and holding 5. After construction, these effects are anticipated to become non-significant.
- 12.12.4. **Moderate adverse** permanent effects during construction are expected at one agricultural land holding during operation of the Proposed Scheme, holding 5. This is due to effects on turnover and profitability from the permanent removal of land. However, this is not deemed to impact the long-term viability of the wider holding.
- 12.12.5. For those travelling via WCH routes, there would be **Moderate adverse** effects during construction and operation for cyclists due to the removal of cycle facilities at the A47/A1 roundabouts and the removal of the A47/ Upton Road/ Peterborough Road roundabout (cycle movements between Ailsworth and Upton). However there would be **Large beneficial** effects for cyclists due to the removal of the A47/ Upton Road/ Peterborough Road roundabout (cycle movements between Southorpe and Ailsworth via Upton). The would also be **Moderate beneficial** effects during construction and operation for users of Wansford Hereward Way Permissive 3 and Wansford Hereward Way Permissive 2 (for users approaching from Wansford) due to the permanent diversion of these permissive routes.

- 12.12.6. During construction, there are likely to be some effects on local communities and potentially their health in terms of the noise and dust created by construction activities and the visual amenity impact of construction vehicles and compounds. However, with mitigation in place, these are not expected to be significant. Mitigation measures including producing an Environmental Management Plan (TR0010039/APP/7.5) and recruiting a Community Liaison Officer would seek to minimise these effects as far as possible.
- 12.12.7. During operation, it is not expected that there would be any changes in health outcomes, however there may be some positive health outcomes in terms of noise and accessibility for some receptors.

References

- Cambridgeshire and Peterborough Draft Health and Wellbeing Strategy. 2019- 2024. Accessed May 2021. Available at:
<https://democracy.peterborough.gov.uk/documents/s40045/Item 6. Appendix A Draft health and wellbeing strategy for HWB Jt WSSC.pdf>
- Cambridgeshire and Peterborough Joint Strategic Needs Assessment Core Dataset, (2020) Accessed May 2021. Available at:
[REDACTED]
[REDACTED]
[REDACTED]
- Department of Environment, Farming and Rural Affairs (Defra) (2020) MAGIC Map. Accessed August 2020. Available at:
<https://magic.defra.gov.uk/>
- Department of Environment, Farming and Rural Affairs (Defra) (2020) Defra Statistics: Agricultural Facts – England Regional Profiles. Accessed August 2020. Available online at:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/866807/regionalstatistics_overview_20feb20.pdf
(accessed 08/2020)
- Department of Environment, Farming and Rural Affairs (Defra) (2020) Defra Statistics: Agricultural Facts – England Regional Profiles. Accessed August 2020. Available online at:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/866807/regionalstatistics_overview_20feb20.pdf
(accessed 08/2020)
- Google Streetview photography: Accessed August 2020. Available at:
[REDACTED]
- Highways Agency (2001) Design Manual for Roads and Bridges Volume 11, Section 3, Part 6 Land Use. Superseded by LA 112.
- Highways Agency (1993) Design Manual for Roads and Bridges Volume 11, Section 3, Part 8 Pedestrians, Cyclists, Equestrians and Community Effect. Superseded by LA 112.

- Highways Agency (1993) Design Manual for Roads and Bridges Volume 11, Section 3, Part 9 Vehicle Travellers. Superseded by LA 112.
- Highways England (2019) Design Manual for Roads and Bridges, LA 104 Environmental Assessment and Monitoring. Available online at:
[REDACTED]
[REDACTED]
- Highways England (2018) A47 Wansford to Sutton Dualling. PCF Stage 3 EIA Scoping Report. Available online at:
<https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010039/TR010039-000017-WANS%20-%20Scoping%20Report.pdf>
- Highways England (2018) A47 Wansford to Sutton Dualling Preliminary Environmental Information Report.
- Highways England (2019) Design Manual for Roads and, LA 112 Population and human health. Available online at:
[REDACTED]
[REDACTED]
[REDACTED]
- Huntingdonshire Council's Local Plan to 2036 (2019) Accessed November 2020. Available online at:
<https://www.huntingdonshire.gov.uk/media/3872/190516-final-adopted-local-plan-to-2036.pdf>
- IEMA (2017) Health in EIA: A Primer for a Proportionate Approach
- Local Health Profiles for the affected Primary Care Networks (2019) Accessed May 2021. Available at: [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
- Natural England, MAGIC maps. Available online at:
<https://magic.defra.gov.uk/MagicMap.aspx>
- New Housing Developments and the Built Environment Joint Strategic Needs Assessment produced by Cambridgeshire County Council. (2015/16) Accessed May 2021. Available at: [REDACTED]
[REDACTED]
[REDACTED]
- Northamptonshire County Council (2020) Public Right of Way Mapping Tool. Accessed August 2020. Available at:
<https://www.northamptonshire.gov.uk/councilservices/northamptonshire-highways/rights-of-way/Pages/the-definitive-map.aspx>
- Office for National Statistics, (2019). Household projected growth by 2041. Accessed August 2020. Available at:
<https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/datasets/householdprojectionsforengland>

- Office for National Statistics, (2011), Census 2011 tables Quick Statistics. Accessed August 2020. Available at:
[REDACTED]
- Office for National Statistics, (2011), Census 2011 tables Quick Statistics. Accessed August 2020. Available at:
[REDACTED]
- Peterborough City Council (2010) Peterborough Local Development Framework: Peterborough Site Allocations DPD. Accessed August 2020. Available online at:
<https://democracy.peterborough.gov.uk/documents/s6969/Site%20Allocation%20Development%20Plan%20Document.pdf>
- Peterborough City Council Adopted Local Plan (2019). Accessed August 2020. Available at: <https://www.peterborough.gov.uk/council/planning-and-development/planning-policies/local-development-plan>
- Peterborough City Council (2020) Public Right of Way Mapping Tool. Accessed August 2020. Accessed:
<https://www.peterborough.gov.uk/residents/transport-and-streets/public-rights-of-way> (accessed 08/2020)
- Peterborough City Council (2016) Peterborough Local Development Framework: Peterborough Site Allocations DPD. Accessed August 2020. Available online at:
<https://democracy.peterborough.gov.uk/documents/s6969/Site%20Allocation%20Development%20Plan%20Document.pdf> (accessed 08/2020)
- Peterborough Health and Wellbeing Board (2016) Health and Wellbeing 2016- 2019 Strategy. Accessed May 2021. Accessed:
[REDACTED]
[REDACTED] (accessed 11/2020)
- Public Health England, Public Health Profile Local Health (Fingertips). Accessed August 2020. Available online at:
[REDACTED]
- Transport and Health Joint Strategic Needs Assessment produced by Cambridgeshire County Council (exec Summary) Accessed May 2021. Available at [REDACTED]
[REDACTED]
- Transport and Health Joint Strategic Needs Assessment produced by Cambridgeshire County Council (Access to Transport) available at:
[REDACTED]
[REDACTED]
- Transport and Health Joint Strategic Needs Assessment produced by Cambridgeshire County Council (Active Transport) Accessed May 2021. Available at [REDACTED]
[REDACTED]
[REDACTED]

- Transport and Health JSNA Dataset produced by Peterborough City Council Accessed May 2021. Available at: (<https://www.peterborough.gov.uk/asset-library/imported-assets/Transport-and-Health-JSNA-Dataset.pdf>)
- World Health Organisation (2019) Constitution Accessed august 2020. Available at [REDACTED]

Glossary

Term	Definition
Accessibility	The ability of users to access land, property, infrastructure, businesses and community assets.
Access	The means by which to approach or enter land, property and assets.
12.14. Agricultural Land Holdings	Land and associated infrastructure for the purpose of agricultural production, e.g. arable farming, dairy farming etc.
Businesses	Land and buildings for the purpose of commercial/industrial enterprise.
Community	A group of people living in the same place or having a particular characteristic in common.
Community land and assets	Land, buildings and infrastructure providing a service/resource to a community, e.g. open spaces, village greens, village halls, healthcare and education facilities etc.
Development land	Land identified in national or local plans, policies or strategies for development (including intensification of existing uses) and land subject to planning permission.
Health Determinants	Personal, social, economic and environmental factors which determine the health status of individuals and communities.
Human Health	A state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity
Health Outcome	The health status of an individual, group or population, attributable to a planned intervention (e.g. a project).
Health profile	Statistical picture of the baseline health conditions and trends within an area. NOTE: A profile can be built up for a variety of scales (e.g. ward, Local Authority or more strategic levels e.g. Local Enterprise Partnerships).
Journey length	Physical length of a journey.
Land-take	Temporary or permanent use of land for a project which takes it from private or public landholdings.

Population	All individuals located in a particular location (this can be local, regional or at a national scale).
Private property and housing	Land, buildings and infrastructure for the purpose of residential use.
Severance	The extent to which members of communities are able (or not able) to move around their community and access services/facilities.
Strategic housing sites	Large scale sites/land allocated in local planning policy for the provision of residential land use.
Strategic employment sites	Large scale sites/land allocated in local planning policy for the provision of employment land use.